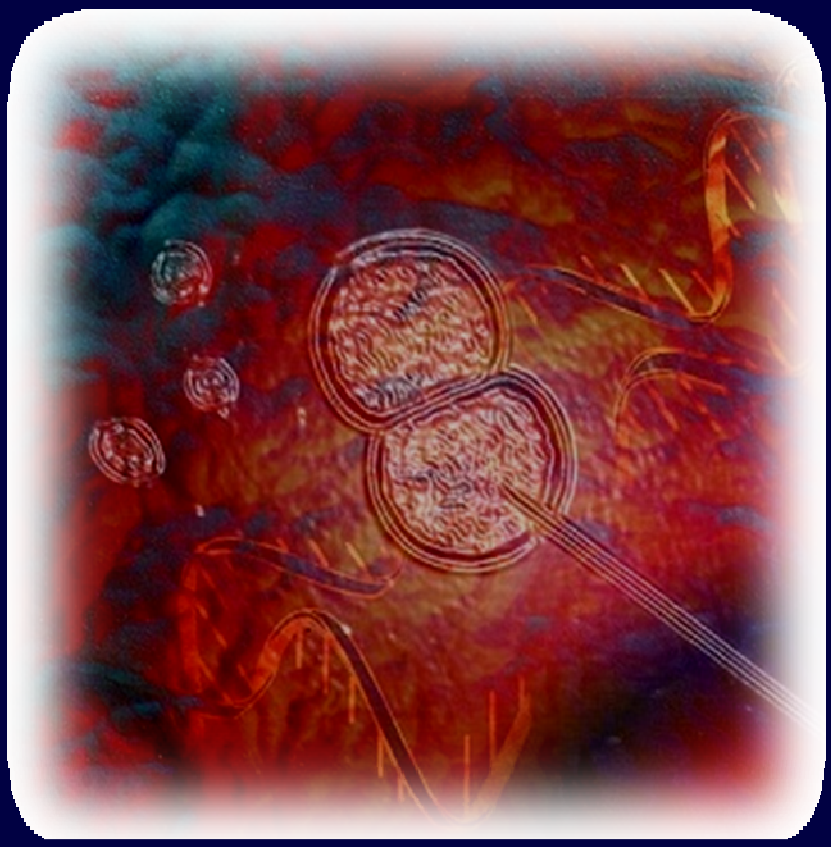
BIOETHICS

GLOBAL & SOCIETAL ASPECTS



edited by:

C.Susanne, A.Cambron, M. Casado, F. Cascais, E. Rebato,

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European Association of Global Bioethics

Laboratory of Anthropology D.U.TH.

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PREFACE

The present book is a collective effort of the contributors involved. The writers have been collaborating since many years, as members of academic networks working on bioethical issues.

It was back to 1996, when 9 EU Universities created under the SOCRATES-ERASMUS umbrella the first European Module on Bioethics. Their objective was to integrate in the curricula of the partner Universities core ethical issues related to the development of Life Sciences, through a multidisciplinary rationalistic approach.

During the first 3 years of its function this Network organized several seminars addressed to the students, in parallel to the foreseen workshops, which took place twice a year, hosted in each partners' place. A package of educational material was produced in English, as well as in the local languages of the partners, ready for use by anyone accordingly interested. Bioethics became an optional course in various departments of the collaborating Institutions.

This collaboration was prolonged for three more years (1999-2002) under the same scheme. During this period the partners, among other activities, succeeded to create the European Association of Global Bioethics, to develop the website of the on-line journal STUDIA BIOETICA and to edit a book entitled *"Societal Responsibilities in Life Sciences"*.

At the end of this phase, the collaboration of the partners had noticeably expanded, including several different disciplines from both Humanities and Sciences. The regular meetings of the collaborating persons became the fruitful background for the development of strong academic links, continuously creating added value. Regardless the lack of funding, the planned workshops and the production of papers on updated issues of bioethics was not interrupted and the partners keep their network active on their own cost.

The EAGB welcomes anybody wishing to join this open forum to submit papers, propose new ideas and enrich the debate.

The editors would like to thank all the contributors for their participation.

NOTES

- The papers presented here reflect the aspects of their authors, therefore anyone interested for further discussions and/or exchange of ideas should contact directly them.
- The artistic covers have used material available in the SCIENCE PHOTO LIBRARY *(http://www.sciencephoto.com)*

PART I

BIOETHICS:

PHILOSOPHICAL & ANTHROPOLOGICAL APPROACHES.

- The Sociogenesis of Bioethics
- The Responsible Ethics of Hans Jonas
- Autonomy, Dignity & Genetic Intimacy. Challenges & Legal Paradoxes
- Global Bioethics & Cultural Anthropology
- Races: Between Biology and Sociology

Sociogenesis of Bioethics

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Abstract

This chapter analyses the factors which have contributed to the appearance and subsequent development of bioethics. We also investigate the reasons which led to the broadening of medical ethics and to becoming what is now known as bioethics. Among these factors, we analyse the problems derived from the application of biological sciences to solve human problems. The analysis starts by considering the problems originated by the negative historical experience of application of eugenic doctrines. We then review the importance of techno-scientific development in the fields of physics, medicine and biology and how it has contributed to form the horizon and the worries and problems that crystallized in the birth of bioethics. In physics, we will comment the influence of the development of nuclear energy with military purposes and its repercussions on the conscience of the scientific community. In medicine, we will value the historical experiences of abuses in the experimentation with human beings and the development of new ways of therapeutic and surgical interventions. In biology, we focus on the development of molecular biology and embryology over the second half of the 20th century and their enormous biomedical consequences, although it is also noted that their social —real or potential— implications in diverse orders (eugenic, industrial and economic) and how these have affected the advance of bioethical thought. Finally, we attempt to identify the social conditions of plurality and respect for human rights necessary for the birth and flourishing of bioethics to have taken place.

Keywords: *Eugenics, techno-scientific development, informed consent, medical experimentation, biotechnology, human rights***.**

1. Introduction

Over the last few decades, the field of bioethics has developed rapidly. The proliferation of committees and commissions under the heading of ethics or bioethics, and putting laws and other legal measures in place, at both a national and international level (within Europe and worldwide), give some idea of the significance of this expansion.

In this chapter we review the social factors that have contributed to the appearance of bioethics and its subsequent proliferation. We set out to identify the social changes and the main events which brought about the ethical reflection which culminated in its birth. In our investigation, we focus on the evolution of the most relevant scientific disciplines and their applications in human beings and the consequences for the development of bioethics. We also attempt to reflect the social context where these changes could be fruitful.

Although many texts have dealt with these issues and there is a widespread agreement among the majority of them over the principal social mutations, which have acted as catalysts in the emergence and historical development of bioethics, this study still has an outstanding importance and interest as the reason for thought, not only for the present of bioethics as a discipline, but also to analyze the trends that may appear in the future with the development of biotechnological research and its possible applications in different areas, especially in the biomedical field.

2. The birth and the field of bioethics

Although the birth of bioethics is usually dated back to 1970, when Van Rensselaer Potter II employed the term for the first time in his article *Bioethics, the Science of Survival* (Potter, 1970), and a year later in his book *Bioethics, Bridge to the Future* (Potter, 1971), its earliest precedents are to be found in the Hippocratic Oath of 500 B.C. (Vidal, 1994), or even earlier, to the medico-legal laws of Ur-Namun, 2050 B.C. (Villalaín, 2001), although these historical cases, and all other subsequent references until recent times, constitute codes of medical deontology rather than bioethics as we understand it today, since they deal fundamentally with the codes of conduct which medics should follow in the exercise of their profession, in particular the attitude which they should adopt towards their patients and the way in which they should treat them. It was not until 1803 when the British doctor Thomas Percival uses the term "medical ethics" for the first time, and carries out the first modern adaptation, although very limited, of the principles of the Hippocratic Oath (Martín Mateo, 1987).

The bioethics of today encompasses a much wider field than that of medical or biomedical ethics, although these represent a very important element within it, as much for their practice in the form of ethical committees in hospitals as for the influence which the inspirational principles of medical ethics have exercised, and continue to exercise, within bioethics as a whole (Beauchamp and Childress, 1994). So much so that, even today for some authors, bioethics is little more

than an updating of medical ethics, and the problems with which it is concerned are limited to those posed by the development of modern medicine (Lolas, 2001). Nevertheless, a broader conception, and one which we believe to be more in tune with the social requirements of the discipline which has evolved under the umbrella of bioethics, extends its range of application to the problems generated by the enormous scientific and technological development, in particular in the field of applied human biology, but with additional branches in other areas, such as the repercussions on other living beings or the environment, covering a significantly wider range of subjects than medical Ethics alone[1].

The journey followed by bioethics since its inception does not correspond exactly with the original idea of Potter, one which was close to Human Ecology, in which demographic growth and environmental problems play a very important role in the survival of the human species, the underlying motif of his conception (Gafo, 1998). Although these problems form part of the corpus of contemporary bioethics, such as in the problematic of genetically modified cultures, this has developed, above all, in the context of the social and moral problems provoked by techno-scientific development, in particular in the application of the biomedical sciences to human beings. This conception is closer to that formulated by André Hellegers, another of the fathers of bioethics and founder of the Joseph and Rose Kennedy Institute for the Study of Human Reproduction and Bioethics, one of the first university centres to pioneer the study of bioethics. Hellegers conceives this as "a branch of ordinary ethics, applied to the kingdom of biomedicine," which applies "its closest attention to biomedical questions" (Ferrer and Álvarez, 2003). This conception is that which, with certain distinctions, has predominated in the development of bioethics in the west.

Various definitions have been proposed, in line with this broad conception of bioethics directed towards biomedical problems. Hottois considers that "the word 'bioethics' designates a set of research works, discourses and practices, generally multi-disciplinary in nature, which aim to clarify or resolve ethical questions raised by the advance and application of the biomedical techno-sciences" (Hottois, 2001). On the other hand, the *Encyclopedia of Bioethics*, edited by Warren T. Reich, defines bioethics as: "the systematic study of the moral dimensions —including moral vision decisions, conduct, and policies— of the life sciences and health care, employing a variety of ethical methodologies in an interdisciplinary setting" (Ferrer and Álvarez, 2003). This broad conception of bioethics, rooted in the scientific and technical development of

[1] Gilbert Hottois has proposed the following list of fundamental themes of bioethics: interventions in human procreation; interventions in genetic patrimony; interventions in aging and dying; interventions in the human body; manipulation of the personality and intervention in the brain; experimentation with human beings; interventions in living beings and non-human living media (Hottois, 2005).

biomedicine, is that which we will adopt in our study of the social factors which brought about its birth.

Having located our subject conceptually and historically, we move on to analyse the social factors that have influenced its emergence and development. These took shape during the course of the 20th century, in particular in the second half, when the techno-scientific industry accelerated spectacularly to the point of constituting one of the most characteristic phenomena of the scientific, industrial and social development of advanced capitalist countries. For Javier Echeverría, "true Techno-science emerges in the 1980's in the United States, although this does not undermine the fact that it has important earlier precedents" (Echeverría, 2003). Given that we have established the birth of bioethics around 1970, if Techno-science emerges in the 1980's, it is difficult to see how it could exercise a significant influence over the birth of a discipline which makes its appearance at least a decade earlier. It is important to specify in this regard, that, for the purposes of this analysis, we can clearly situate the development of Techno-science throughout the whole second half of the 20th century, in what Echeverría refers to as the 'earlier precedents'. It is possible that the characteristics of the techno-scientific revolution had not been fully established during this period but, in as much as some of the definitive traits of contemporary Techno-science have significantly deeper roots and have social consequences which, as we will see, are translated into moral concerns that contribute to the subsequent birth of bioethics, it is necessary to hark back to these dates to identify the influence of Techno-science in its genesis.

3. Eugenics

Nevertheless, we will begin our analysis in the dawn of the 20th century, long before the development of modern Techno-science. It is from this period that the practical application of eugenics dates. This was the doctrine founded by Francis Galton in the previous century, in an attempt to scientifically plan human reproduction with the aim of genetically improving humanity by selecting the best specimens (Soutullo, 1997). The ideas of Galton were initially inspired by Darwinian natural selection. However, his North American followers, who were the first to put his doctrine into practice, were more notably influenced by the emerging Mendelian genetics (Kevles, 1995; Soutullo, 2006). This practical application of eugenics ultimately took the form of laws which legitimated the forced sterilisation of people considered to be carriers of undesirable characteristics, in the belief that these characteristics were hereditary due to the fact that they were genetically determined. The first of these laws was passed in 1907, in the State of Indiana (USA), and was aimed at "incorrigible criminals, imbeciles and outlaws" (Goikoetxea, 1998). By 1950, 33 states had passed similar laws due to which "50,193 sterilisations had been officially carried out" (Gayon, 1997). Nevertheless, over time, the majority of these laws were abolished or simply ceased to be applied, above all after the Second World War. The last of these laws, in the State of Virginia, remained in force until 1972. Even at such a recent date as "July 1973, a U.S. Senate Investigation Committee,

presided over by Edward M. Kennedy, obtained testimony from the Department of Health, Education and Social Security that at least 16,000 women and 8,000 men had been sterilised by the Federal Government in 1972 [...] a high proportion of which were black (in relation to the percentage of the population who were black)" (Woodward, 1982). Eugenic sterilisation laws were also passed and put into practice in various European countries, especially in Germany and the Scandinavian countries (Soutullo, 2006), thanks to which thousands of people were sterilised without their consent or by means of deceit or duress.

Historically, the practical application of eugenics highlighted problems and worries which have influenced the subsequent development of bioethics. Among the characteristics which favoured this influence we can quote the following: eugenics, at least on the paper, attempted to tranfer the scientific knowledge of the theory of evolution and genetics to human beings and make them into a kind of social engineering which conditioned, or even determined future social evolution. Its practical application meant the violation of human rights, both of individuals and of whole groups, with racist, xenophobic or classist nuances, depending on the countries and the periods concerned. This violation, although with different degrees of intensity, was carried out both in totalitarian countries (for instance, in Nazi Germany) and in countries of liberal and democratic tradition, such as Scandinavian countries or the United States, where moral concerns in relation to these practices were more likely to settle and flourish. These applications of eugenics had a legal translation in the form of laws, which entailed an important precedent for the reflections and discussions of what over time, has become the relationship between bioethics and law. In this regard, the sentence in the case of Back vs. Bell, given by judge Oliver Wendell Holmes, where he justified the eugenic sterilization of the young woman Carrie Buck with the argument that "the principle which supports the compulsory vaccination is too wide as to justify the ablation of the Fallopian tubes", to conclude that "three generations of imbeciles were enough" (Smith, 1993), is known for its negative connotations. Eugenics and its consequences aroused a steam of opposition, even from the core of the eugenic movement itself, which has been called the stream of reforming eugenics, which began to appear some time before the atrocities committed by the Nazis came to light (Kevles, 1995), opposition provoked both by its lack of scientific nature and by the social discrimination which it brings about, this last aspect being particularly important in relation to the worries of a bioethical nature. Eugenics openly created questions of a moral order, such as if it is legitimate to violate the rights of individuals in the interests of the hypothetical benefit of present or future society.

These characteristics of eugenics, here presented succinctly, and the lasting social impact they had, above all in the countries where it was applied, were an important watershed for the subsequent bioethical thought, not only in relation to the historical experience of eugenics itself, but also, and not less importantly, in relation to the potential future consequences of the development of

biotechnology, genetics and molecular biology applied to human beings, what some authors have termed neoeugenics (Romeo Casabona, 1999). This last aspect has become so important that these potential eugenic consequences comprise one of the most important references of bioethics today.

4. Physics

As we have indicated previously, the development of new technologies associated with the techno-scientific revolution and its social consequences, present and/or future, were an essential element in the appearance of a moral conscience, first, and in the birth and rise of a real discipline such as bioethics, subsequently. This is especially evident in the fields of physics, medicine and biology.

The paradigmatic example of the terrible consequences that the technological development can have for mankind is nuclear energy used for military purposes. Since the start of the Manhattan Project and its culmination with the launch of the atomic bombs over Hiroshima and Nagasaki, the moral concerns due to the tragic consequences were clearly present. Until that very moment, it was still possible for some naïve scientists to maintain that science and politics could be independent, that science had an internal logic and some priorities of research derived from that logic and that the application of scientific discoveries with a social scope especially belongeg to the field of politics, which had some working rules and some needs which differ from the ones in science; in short, science could go one way and its applications another. This viewpoint had already been seriously queried when, during World War I and the following years, the European Scientific Community, especially the one of the physicists, was completely divided when the overwhelming majority adopted warmonger and nationalistic attitudes.

The explosion of the two atomic bombs over the civil population and the destruction and death that they provoked had an enormous impact on the conscience of many scientists, who noticed more clearly than ever the direct and disastrous consequences that their researches might have. We all know the famous sentence by Oppenheimer, director of The Manhattan Project in Los Alamos Laboratory, in relation to Hiroshima and Nagasaki bombs: “In a crude sense, that no vulgarity, no humour, no exaggeration can extinguish completely, physicians have known the sin; and this is the knowledge they cannot get rid of” (Cornwell, 2003).

In the years that followed World War II, the civil applications of nuclear energy led to the concern of some important geneticists who defended eugenic projects. The studies carried out on the medium and long term consequences of radioactivity provoked, first, by bombs and, then, by the nuclear reactors of the power stations used for the production of electric power, made the Nobel Prize Winner H. Muller formulate the following pessimistic prediction derived from the combination of the dysgenic consequences of medicine and the effects of radiations: “the future of the human race is finishing by having two kinds of

individuals: those who are hardly able to move, and those who are less affected but spend all their time looking after the first ones" (Strickberger, 1990). The concept of genetic or mutational burden, which Muller had developed as a part of his contribution to the genetic of populations was translated, when it was applied to the human beings, into this dark outlook, what, according to his criterion he imposed the necessity of negative eugenic measures, as the only way to stop the unavoidable degeneration of the human race. Muller's concerns have reappeared time and time again in different ways, motivated by the bioethical reflections which biomedical research has fostered.

5. Medicine

If the use of Physics has motivated concerns and reflections of an ethical nature that, in a general sense, we can say are part of the social factors which preceded the birth of bioethics, medicine is at the centre of these concerns. As we have already pointed out, the latest precedents of bioethics are found in medical deontology and ethics. These disciplines experienced a series of very significant changes during the second half of the 20th century, leaning on two fundamental pillars: on the one hand, the appearance of new treatments and therapeutic and surgical possibilities; on the other hand, the changes of mentality in the conception of the patients as people with decision capacity, in particular the acceptance of the autonomy principle which is the basis of informed consent.

The development of new treatments and therapies, as a consequence of scientific and technical progress, led to the appearance of dilemmas of a moral scope, which could not be found previously because they were not in the horizon of what was practicable. In 1960, Screibner was able to carry out repeated dialysis on people with serious renal disease in Seattle. In view of the limited capacity to pay attention to the large number of sick people needing treatment, in 1962 the Dialysis Centre in Seattle acknowledged the need to prepare some selection criteria for patients and, to solve this, they created a committee with the majority participation of people not belonging to the health field. This was one of the first precedents for what was later to be known as an ethics committee.

Another landmark in the implantation of new therapies was the first heart transplants, executed by the South African cardiologist Christian Barnard. Over and above the great impact in the media of these first transplants, this fact had important implications for bioethical reflection, since it led to a rethink of the criteria used to determine the death of the individual. Unlike other organs, the heart must be taken from the body of the deceased donor when still active, which raises the difficult problem of combining some criteria clear to determine when the individual is really and irremissibly dead, with the need that such determination is not too late to prevent the use of the organs for other transplants. Whereas the kidneys can be removed from de donor soon after death, when there are no vital signs of activity, this is not possible with the heart. Discussions aimed at identifying clear, unified criteria to determine effective

death, continue, to the extent that nowadays, brain death is mostly used in the majority of countries, although it still has its detractors.

The other pillar we have mentioned is the changes of mentality as regards the treatment given to the patients and the subjects of medical experimentation. As early as 1914, the sentence on "the right of self-determination of the patients" was given by Judge Cardozo in the case of Scholendorff vs. Society of New York Hospitals. In it Cardozo wrote: "every human being in their adult age and in their right mind has the right to determine what must be done in their body, and the surgeon that operates on them without the patient's consent commits an assault, which is why he is responsible for the damage. This is true except in cases of emergency where the patient is unconscious and where operating is necessary before the surgeon can get consent" (Goikoetxea, 1998), which at least in the United States was useful to establish the legal basis for informed consent. However, the fact which shook consciences more profoundly was the knowledge of the atrocities carried out by the Nazi regime. Shown during the Nuremberg Trial held between 20th November 1945 and 1st October in 1946, where the main leaders of Nazism, who were still alive, were judged and condemned (Fernández and Rodríguez, 1996). In the following trials, 23 German doctors were judged, 16 of them were declared guilty and 7 condemned to death (Gafo, 1998).

It is important to highlight the fact that during the Nuremberg Trial, the denunciations of eugenic practices conduted in Germany were practically non-existent. Needless to say, the use of humans as guinea pigs in experiments and the physical elimination and mass extermination of people belonging to various groups, especially de Jews, was denounced and condemned. However, the foundation of the eugenic laws applied in 1933 was not called into question. This was due to the fact that in many North American states the eugenic laws were also applicable, some of which had even inspired the writing of the German laws (Kevles, 1995).

One of the immediate consequences of the trial was the application in 1947 of the Nuremberg Code, written in ten points, aimed at protecting the dignity and freedom of the individual, against possible abuses or perversions of biomedical experimentation (Casado, 2004).

In the sixties and seventies, denouncements of experiments with human beings, where their rights as people had not been respected or were flagrantly violated, began to arise. Some of them referred to the use of drugs which caused serious iatrogenic effects when a satisfying experimentation had not been carried out previously, as was the case of thalidomide, in 1961. Others, the most serious and abundant, referred to experiments where human subjects had been treated as simple guinea pigs.

In 1972 the Tuskegee case came to light: an experiment which had started in 1932 and carried on for almost forty years. This involved monitoring the course

of syphilis in a sample of almost four hundred Afro-American people from Alabama who had never been treated. The intention was to observe the natural evolution of the disease, in the long term, without any treatment. The people studied were not informed and the participant doctors merely stood watching, regularly, what naturally happened. The objectives could not be clearer, since they were expressed in an article in 1936, published in the *Journal of the American Medical Association*, which described it as "an unusual opportunity to study the syphilitic patient who was not treated from the beginning of the disease to the death of the person" (Lolas, 2001). In Lolas' opinion "the long duration of this study, the moment of its beginning, the nature of the disease and the racial condition of the people studied, besides the fact that even having the suitable treatment, the individuals who took part in the research were not informed, make it an exemplary case in the history of bioethics" (Lolas, 2001).

The Tuskegee case was not the only case of abuse for medical purposes. Others, which also shook the North American public opinion, were the infection of the hepatitis virus in mentally handicapped children to study the natural course of the disease, with the aim of developing a vaccine against it, occurred from 1956 to 1971 in Willowbrook, an institution for retarded children in Staten Island (New York) or the inoculation of cancerous cells into old patients, carried out in 1963, in the Jewish Hospital in Brooklyn (Ferrer and Álvarez, 2003). Some of these cases were exposed in an influential article by Henry Beecher, published in 1966, in the *New England Journal of Medicine*, with the title of "Ethics and clinical research". Beecher denounced in his work that 22 medical articles published during the year 1964 (approximately 12% of the articles analyzed) had questionable procedures from an ethical point of view (Gafo, 1998). In other countries, abusive medical investigations were recorded, using vulnerable subjects in experiments, which did not respect some of the basic human rights, such as in Australia where, between 1945 and 1970, hundreds of babies and children from orphanages were used to prove the effectiveness of vaccines against herpes, whooping cough and flu (Miliken, 1997).

In the United States, the knowledge of these experiments provoked, in 1966, the creation of an ethics committee depending on the NIH which, subsequently culminated in setting up the National Commission for the Protection of Human Subjects and Behavioral Research, in 1974. A product of this work was the publication of *The Belmont Report: Ethical Principles and Guidelines for the Protection of Human Subjects of Research*, where the principles of bioethics were stated for the first time, presented as three principles, respecting people, charity and justice, subsequently reformulated by Beauchamp and Childress in the known principles of autonomy, absence of malice, charity and justice (Beauchamp and Childress, 1994). In this new formulation, the principle of beneficence divided into two: absence of malice and charity. In this manner, bioethics acquired a level of discipline with recognition of institutional importance.

Other statements, which also made an important contribution to the recognition of the problematic of bioethics in relation to the treatment to give to patients and to the subjects of medical experimentation, were the subsequent declarations of the World Medical Association, beginning with the one given in Helsinki in 1966, later amended in Tokyo (1975), Venice (1983) and Hong-Kong (1989). The Helsinki Declaration is inspired on the values of the Universal Declaration of Human Rights and defines the ethical conditions of experimentation with people. Among these conditions an explicit recognition of informed consent is made (point 10) and the formation of committees to evaluate the research projects, independent of the researcher and research sponsor is recommended (point 2).

6. Biology

We have commented that in physics the development of nuclear energy, above all, with military purposes, fostered reflection on the social consequences of research and the dangers of its applications. We have also seen how, in medicine, the excesses in experimentation with human beings, on the one hand, and the scientific and technical advances in therapies and operations on the other hand, contributed to provoke a profound change in medical ethics. We now focus on the changes taking place in the field of biology and its effect on bioethical thought.

From the 1940's, we begin to note a series of research woks in the field of genetics which, in the end, provoke such deep changes that we can almost speak of the real revolution, that which corresponds to molecular biology and biotechnology. This period commenced 1944 with the discovery, by Avery, MacLeod and McCarty, that DNA constitutes the hereditary material, a fact corroborated a few years later, in 1952, by Hershey and Chase (Stent and Calendar, 1978). These discoveries stimulated the research into DNA structure, established by Watson and Crick in 1953, with the famous three-dimensional model of the double helix, which perhaps constituted the most outstanding scientific discovery in the entire 20^{th} century and perhaps with the greatest significance in the whole history of biology. Since then, research work accelerated. A few years later, the mechanisms of genetic expression (transcription and translation), which led to the synthesis of proteins, are established, and the nature of the genetic code is deciphered (Knippers, 1975). From the beginning of the seventies, these advances in research culminate in the development of genetic engineering and biotechnology, provoking a very deep change in biology, which not only extends down to nowadays, but also projects its developments towards a future that will undoubtedly provoke scientific and social changes of enormous consequences.

This revolution in molecular biology, its applications in diverse fields, especially in the biomedical field and its economical and social consequences, have decisively contributed to broaden the field for thought in biomedical ethics to other grounds until it became the new discipline of bioethics which covers,

besides the characteristic topics and concerns in medicine, new challenges derived from the uses of molecular biology applied to human beings.

An event of enormous importance in this revolution was the discovery, made in 1968 by Linn and Werner Arber, of the restriction enzymes (Sánchez Ron, 2001). These are a kind of enzyme of bacterial origin, which cut the DNA in specific places inside the molecule (endonucleases), the EcoRI being the first to be identified, from the intestinal bacterium *Escherichia coli*. Using restriction enzymes, it is possible to cut DNA fragments from different origins, even from very different species, and assemble them in a new hybrid molecule called recombinant DNA. This was precisely what, for the first time, Boyer and Cohen in 1973 were able to achieve (Watson, 2003), thus inaugurating the era of genetic engineering.

Manipulation of DNA, which is possible with genetic techniques engineering, has an important influence on the subsequent development of biology and biomedicine and also in its implications for bioethics. One of the first was the awareness among molecular biologists about the safety problems in the experiments, as a consequence of the potential or real dangers that research with recombinant DNA could entail. On the Nobel Prize winner Paul Berg's own initiative, a group of outstanding biologists, who proposed the holding of an international conference to discuss safety problems in the laboratories where genetic engineering experiments were carried out, met in 1974. The conference was held in February 1975, in Asilomar (California), with the participation of 150 scientists (Sánchez Ron, 2001). A research moratorium was passed and some self-regulation criteria were drawn up, and these criteria were subsequently adopted by the North American Administration.

Another of the important implications of genetic engineering was the possibility of commercial exploitation of the research results, due to their potential industrial uses. Indeed, recombinant DNA technology made it possible for industry to obtain molecules of biological interest with pharmaceutical applications, such as human insulin, the growth hormone or the coagulation factors for the treatment of haemophilia, which led to the development of biotechnology, with uses in the field of biomedicine, cattle raising or agriculture. Fruit of this was, first, the appearance and subsequent and proliferation of a new type of biotechnology companies devoted to economic exploitation or research (Muñoz, 2001). In this same direction, applications for several types of biological patents started to appear, and even for genes, which led to important changes in patent rights, first in the United States and later in Europe. "In 1987, the American Patent Office gave the right to patent transgenic pets, i. e., created by means of genetic engineering. Using this agreement of 12th April 1988, the patent of a transgenic mouse produced at Harvard University was accepted (Sánchez Ron, 2001). The debates about the convenience or not of accepting this and other similar patents of material from human beings contributed to the enrichment and maturing of bioethics.

The importance of the development of molecular genetics for bioethical reflection reached its peak with the Human Genome Project, i. e., the objective of sequencing the complete DNA in human cells, which contains two entire complements of chromosomes with 3,100 million nucleotides each (Soutullo, 2006). This undertaking, initiated in the 90s and completed at the beginning of this century due to the combined competence and effort (not exempt of tensions) of an international public consortium and the private company, Celera Genomics, entailed an enormous encouragement for the development of bioethics. In the first place, for the huge economic, scientific and social consequences that the project could have in the medium and long term; in the second place, because one part of its economic budget (3% at the beginning, subsequently extended to 5%) was for studying its ethical, legal and social repercussions (Davies, 2001); in the third place, because it triggered a plethora of debates, symposia and publications where these repercussions were analyzed and discussed deeply from different points of view. This all led to an important boast for bioethics, whose concerns began to appear more and more regularly in the media.

The ethical and legal concern about the consequences of research into the human genome ended in the passing of a Universal Declaration on the Human Genome, 11th November 1997, at the UNESCO General Conference, also approved later by the U.N.O. General Assembly 9th December 1988 (Romeo Casabona, 1995). This declaration includes some of the concerns, by way of recommendations, which have been part of the bioethical debates of the last few years regarding the consequences of research in molecular biology with human biological material. One of the topics which is quoted, although not developed in the declaration, but which has been very important in the biological discussions, is the topic of gene therapy, especially the possibility of its use in the human germinal line.

Somatic gene therapy, which involves inserting a gene in a patient's cells to restore normal function in the organism, is at the experimental stage and, although limited success has been achieved, for the moment it has not produced the results expected in the future. Its ethical implications are quite limited. On the contrary, germinal gene therapy, which has never been put into practice in human beings so far, presents ethical problems of great importance (Soutullo, 2006), which is why its prohibition has been called for by several fields or at least a moratorium, until all the implications can be evaluated in depth. Among these, there would be the possible eugenic consequences if this form of human genetic engineering were to be applied not with a therapeutic purpose but for purposes of genetic improvement (Buchanan et al, 2000). The discussion about the ethical and social implications of germinal gene therapy and genetic engineering for improvement illustrate the maturity that bioethics has been achieving in recent years in relation to the consequences of the development of molecular biology.

Besides genetics, other two areas of biology have had important repercussions in bioethics due to the moral implications which are derived from them. These are

reproduction biology, particularly assisted reproduction, and embryology, above all, regarding cloning.

Assisted reproduction has made a considerable impact on the world of bioethics since Louise Brown was born in England on 25th July 1978, the first person born from an in vitro fertilization (Grobstein, 1986). Such an important achievement, P. Edwards and P. Steptoe's doing, supposed a true landmark, which soon started to have a wide medical use, since it enormously increased the possibilities of treatments against infertility. Particularly its moral repercussions due to possible problems of affiliation as the oocytes and spermatozoids donated by third persons or pregnancy by a surrogate mother. No less ethical importance is the possibility of embryo manipulation, which opened the way for in vitro fertilization, the oocytes fertilized being outside the female reproductive system. Debates on these issues have been developed over the years, being expressed in many countries in laws which reflected, to a greater or lesser extent, the majority state of opinion existing in every country in relation to the questions provoked by assisted reproduction.

The other field quoted, embryology, although conceptually different from reproductive biology, needs this as a prior condition. Indeed, it is only possible to research into embryonic development if the embryos are accessible for study. That is why the development of embryonic research in humans (and in mammals in general) was boosted since in vitro fertilization could be used as a regular form of assisted reproduction. This boost experienced by embryology made knowledge of the first stages of embryonic development advance enormously and made it possible to implement several techniques for handling embryos. The different modalities of cloning were among these, such as the division of embryos and nuclear transfer. Although cloning techniques were not used directly in humans, with the exception of the division of embryos made in 1996 by Hall and Stillman from unviable embryos remaining from in vitro fertilization (Soutullo, 1998), the controversies about the moral implications of reproducing clonal human beings have been frequent (Jonas, 1997) and have become one of the central themes of bioethical discussion since the birth of Dolly the sheep (Wilmut et al, 2000).

To conclude this section on biology, we must point out that its influence on bioethics has not been confined exclusively to the problems directly related to human biology. The problematic of genetically modified cultivation (transgenic plants) (Iáñez, 2002) and the use of animals in research or as a possible source of organs for xenotransplantations (Romeo Casabona, 2002), above all the first of them, have generated strong controversies, which have sometimes extended the regular circles of discussion of bioethics and have acquired a much wider social score. Although its repercussion about the development of bioethics has been a bit late, especially referring to the problematic of transgenic plants, its scope has acquired a quite notable range. We must also point that some of the problems provoked by genetically modified cultivations are related to some of the

environmental concerns expressed by Potter in his germinal documents on bioethics.

7. Other fields of bioethical influence

Although the areas of science analyzed here have a narrower relationship with the birth and development of bioethics as a discipline, they are not the only ones that, at different moments, have drawn attention to its influence. The problems derived from demographic growth at a worldwide level and the policies of birth control in third world countries have also formed part of the universe of the concerns of bioethics (Kieffer, 1983), which is why they not only affect the economic and social development of the countries but also the people's rights, particularly women's reproductive rights.

The questions related to women rights to control their own body and the capacity to decide essential questions about reproduction have spread to different scenes. We have just referred to those related to demographic growth. We have also focused on assisted reproduction problems, which have provoked so many discussions of bioethical nature. These topics have been part of the demands of the feminist movement, a movement which has had a profund influence on the evolution of mentalities in many facets of social life, especially in the Western developed countries. Their repercussions have affected many fields of theoretical, political and social reflections, apart from bioethics. Having been constituted as a movement with its own demands, with a capacity to organize and with demonstrations to defend them, it has given feminism a very wide social dimension. Among their demands, one which has had a great repercussion in the discussions of a moral order, and which has left an important mark in the bioethics, has been its defence of the right to abortion, as the clearest and conclusive expression of the capacity of women to control their own bodies. The question of abortion has been central in bioethical discussions, since it affects the moral assessment of embryos and, as a consequence, the respect and protection derived from this assessment and, of course, the conflicts of values which inevitably arises (Amy, 2005).

Demographic growth is also linked to environmental problems, another of the fields where ethical reflection has developed, although autonomously from the rest of the bioethics; to show this difference, ecoethics or environmental ethics are usually mentioned (Hottois, 2005). We have already commented that environmental problems formed part of Potter's original theoretical discourse. However, as we have just pointed out, these problems have been somewhat separated from the subsequent display of bioethics. It has been another importance social movement, the environmentalist movement, which has been responsible both for the theoretical development and practice, including its organized dimension, of environmental problems. But, despite this dissociation, the environmental problems come, as we will expound later, the same critical current before the development of techno-sciences where bioethics has also inspired, even before it appeared like one.

8. The social context of the birth of bioethics

The social context which led bioethics to emerge as part of the human rights philosophy, reflected in the Universal Declaration of Human Rights, was approved by the U.N.O. General Assembly in 1948. Although the initial inspiration of the declaration has nothing to do with the ethical problems caused by science and technology, above all of a political nature (Hottois, 2005), several authors have pointed out that the human rights philosophy, as the rights of the person or individual, has been a very important source of inspiration in the development of bioethics (Lolas, 2001; Hottois, 2005), which has been clearly revealed in some important declarations which marked its history, such as the ones of the World Medical Association, of the World Health Organisation or the Belmont Report itself.

A second aspect which has marked a precedent in the birth of bioethics, as mencioned earlier, has been the increasing critical conscience against the science and technology advances, what we could call the critic of the idea of progress. This has appeared and has extended due to the problems generated by the very expansion of science and technology. In view of the optimistic, naïve idea that science and its applications would almost automatically solve all the present and future problems of mankind, a current of scepticism and pessimism began to arise, when it was noted that technological development led to important problems, as in the case of environmental problems, for which we cannot discern clear solutions from science itself. As Hottois has pointed out, "the power associated with the new technologies seems to be loaded with new dangers for individual rights. The manipulative virulence of techno-science seems to have risks for the equality and dignity of the human being". And although, he adds: "a fairer appreciation consists, undoubtedly, of recognising the ambivalence of the techno-scientific development and keeping away both from progressive messianism and apocalyptic and technophobic obscurantism" (Hottois, 2005), we have to recognise that in the years prior to the birth of bioethics, the ideologies critical with the scientific and technological development of the capitalist countries extended and exerted a not inconsiderable influence in the reflections about how to face the problems arising from the application of scientific advances to human beings.

A third aspect which has also been present in the advent of bioethics has been a certain perception of the failure of the traditional ethical problems to give a response to the concerns generated by scientific advance (Archer, 1996). The philosophical ethics which was developing in the 60s in the 20th century, above all in some countries such as the USA, was far removed from the normative ethics and was dealt, above all, with the other kind of problems with limited or zero interest for the moral reflection which techno-sciences provoked. In the words of D. Callahan: "Moral philosophy in that analytic model was almost entirely centred on the fight between utilitarianism and deontology, and even this debate remained submerged below the interest, even greater, in the metaethics, bogged down in the uses and the statute of concepts and moral

language" (Callahan, 1999). Some philosophers reacted against this situation, among whom were H. Jonas, S. Toulmin and others and were oriented towards the bioethical reflection. Toulmin's sentence, "bioethics saved the philosophical ethics" (Ferrer and Álvarez, 2003) is well known.

Finally, we note the issue of the social context where the birth of bioethics has been possible. This, which in essence is based on the reflection and debate about the problems of medicine, science and technology, developed freely and unconstrained by dogmatic or authoritarian attitudes, can only exist in open and plural societies, where the different moral conceptions can be exposed and coexist (Hottois, 2005). The possibility of solving ethical dilemmas or looking for acceptable consensus is only possible when the discussion about central topics of bioethics, about "the sense and the value of life and death" (Hottois, 2005) can be debated in an environment of freedom and respect, even the thorniest topics, those on which, a priori we know that the agreement is practically impossible. In countries where the ethical plurality of the society is repressed and substituted by an imposed official moral, it is not possible for bioethics to be developed. That is the reason why bioethics was born, grew and prospered in democratic and plural societies. It is also for the same reason that bioethics, which at the beginning was linked to certain Christian religious options, has tended to evolve towards a secular bioethics, where the reflections are inspired on rational arguments, which can be debated and shared at least in theory, by any interlocutor apart from the moral or religious options of its beginning. Although in reality such an agreement is practically unviable in many cases, it is only a precondition for the existence of bioethics that the different moral options can coexist and face each other without prejudices.

9. Conclusions

a. The precedents of bioethics date back to antiquity, in the codified medical deontology in the Hippocratic Oath.

b. In modern times, it has become medical ethics, when patients began to be considered as autonomous people, with a capacity to take decisions over their own lives while the figure of informed consent appeared. The human rights philosophy, the abuses of medical experiments in treatments and surgical techniques are the driving forces behind this change.

c. The broadening of the scope of medical ethics and its evolution into modern day bioethics occurred in relation to the consequences of techno-scientific development in the field of biology. Although the application of nuclear fission technology with military purposes acted as a salutary lesson for the awareness of the scientific community of the social consequences of techno-science applications, it was the development of molecular biology and embryology and their applications to the human beings, which created the appropriate conditions for the start of bioethics as a branch of ethics, with sufficient strength to become a discipline in its own right.

d. The revolution of molecular biology, with multiple potential applications in several areas, especially in the biomedical field, has made bioethical reflection progress enormously. The dilemmas associated with the enormous development of the techniques of genetic diagnosis and the possibilities of therapeutic interventions and/or eugenic derived from them have fostered the appearance of bioethics, with a certain frequency, from the specialized circles and has been focused on by the media. The Human Genome Project and the advances in the cloning techniques have been the latest events of great importance in the maturing and developing of bioethics.

e. The extension of a critical current in the light of the scientific and technological advances and the negative consequences of some of their applications, on the one hand, and the fact that the traditional ethics reference points turned out to be insufficient to make an in-depth analysis of the problems arising from the development of techno-science, especially from biotechnology, on the other hand, have provided the right environment for the development of bioethical reflection, above all in countries where the conditions of freedom have allowed ethical and ideological plurality present in society to come to the surface in the form of discussions and debates where the bioethics has been taking shape.

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The Responsible Ethics of Hans Jonas

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Abstract

The study first gives a short review of Jonas' life and work. In the followings we are going to deal with the book *The Imperative of Responsibility*, focusing on the diagnosis, the therapy of the environmental crisis, and the question of responsibility. We point out that many of his theses (criticism of anthropocentrism, the altered nature of human action, differences of previous and modern man-nature relations, criticism of modern technology, accentuation of the precautionary principle) can be found in American environmental philosophy. However, Jonas places these motives in his own ethical system where the central idea is to prevent the 'summum malum' (menacing the essence or existence of the human race). In this struggle the concept of responsibility plays a central role, especially that of politicians.

Key words: *altered nature of human action, criticism of technology, wager, responsibility of the politician*

The Jonas oeuvre

German-born philosopher Hans Jonas (1903 - 1993) studied under Martin Heidegger and Rudolf Bultmann in the 1920s. In 1933, he left Germany for England in the same year, and from England he moved to Palestine. In 1940 he returned to Europe to join the British Army that had been arranging a special brigade for German Jews wanting to fight against Hitler. Immediately after the war he returned to Mönchengladbach to search for his mother, but found that she had been sent to the gas chambers in Auschwitz concentration camp. Having heard this, he refused to live in Germany again. So he returned to Palestine and took part in Israel's war of independence in 1948. Jonas taught briefly at the Hebrew University of Jerusalem before moving to North America. In 1950 he left for Canada to teach at Carleton University; from there he moved to New York City in 1955 where he lived for the rest of his life. He worked for New School of Social Research 1955-1976 and died in New York City.[1]

The work of Jonas can be divided into three main periods.[2]

I. In the beginning he studied *gnosis* – which is one of the most representative form of western dualism – in its own negativity. The most important publication of this time is *Gnosis und spätantiker Geist.*[3]

II. In his next period Jonas dealt with the philosophical problems of life. In his introduction to his 1974 anthology of essays, Jonas speaks tellingly of the motivations of his work during the "*five years of soldiering in the British Army*" in which, "*cut off from books and all the paraphernalia of research*" he had to cease work on the study of Gnosticism.[4] This topic

[11] http://en.wikipedia.org/wiki/Hans_Jonas

[2] Harvey Scodel: *An interview with Professor Hans Jonas* – Interview Social Research, Summer, 2003

[3]. Hans Jonas: *Gnosis und spätantiker Geist I –II* (1934 and 1954) An English summation of the two volumes, under the title *The Gnostic Relegion: The Message of the Alies God and the Beginnings of Chiristianity,* was published, again to great critical acclaim, in 1958 . See Levy (2002) p.6

[4] Levy (2002) p. 5 "*The apocalyptic state of civilization, the threatening collapse of a world, the climatic crisis of civilization, the proximity of death, the stark nakedness to which all issues of life were stripped, all these were ground enough to take a new look at the very foundations of our being and to review the principles by which we guide was thrown back on the philosopher's basic duty and his native business−thinking. And while living in tents and barracks, being on the move or in position, tending the guns or firing them, all the reductive primitivism and ordered waste of the soldier's life in a long war are most preeminently conductive to thinking−and thinking to the point−when there is a will to it"* Jonas (1980) p. xii

made it possible for him to transcend dualism positively. The most important work of this period is *The Phenomenon of Life: Towards a Philosophical Biology* (1963).

III. In the end he applied his results to the challenges of the modern era focusing on the problems brought about by modern technology. The most significant study of this era is *Das Prinzip Verantwortung. Versuch einer Ethik für die technologische Zivilisatio*" (1979).

In our present paper we take into consideration the two latter periods of Jonas' work, and from the perspective of bioethics and environment-philosophy. In his *The Phenomenon of life* Jonas constructs his version of the ontology of life through a polemic rejection of materialist thinking. According to him gnosticism, similarly to modern natural sciences is dualistic, mainly in terms of material substance and spirit or necessity and liberty. In his theory, however, liberty can be detected in its embryo form even in the primitive processes of metabolism. Life, in fact, is the overall unfolding of this primitive momentum of freedom.[5]

Jonas ascribes great importance to the inherent teleology of all living beings. As he writes the fulfilling of any real goal is welcome, and its frustration is bad. All living things *approve* their own beings in contrast to *not* being. This primer "yes", namely the setting of life in opposition with death is the basic source of value as such. Goal-bearing organisms have intrinsic values, too, that is they are superior to any other aimless forms of being. On this ground does Jonas stress the objectivity of values. As he writes in the epilogue of the book: "*Ontology as the ground of ethics was the original tenet of philosophy. Their divorce of the »objective« and »subjective« realms, is the modern destiny. Their reunion can be effected, if at all, only from the »objective« end, that is to say, through a revision of the idea of nature…. However that may be ( ), only an ethics which is grounded in the breadth of being, not merely in the singularity or oddness of man, can have significance;*"[6]

It's worth reminding that two decades later biocentrism, a branch of American eco-philosophy came to similar conclusions. Paul Taylor (in 1981 and in 86) also stressed that every living being is an equally teleological center of life, and as such it bears intrinsic values.[7] The protection - or the letting alone at least - of

[5] Jonas (1966): p.xiii

[6] Jonas (1966) p. 284

[7] Taylor defines being a teleological center of life as goal-oriented internal functioning and external activities that tend to "maintain the organism's existence through time and to enable it successfully to perform those biological operations whereby it reproduces" and adapts to a changing environment (Taylor, 1986 121-2).

all entities bearing intrinsic values is a moral responsibility of all of us. Unlike Taylor's egalitarian and deontological biocentrism, Robin Attfield (1987) argues for a hierarchical view that while all beings having a good of their own have intrinsic value, some of them (e.g., persons) have intrinsic value to a greater extent. Attfield also endorses a form of consequentialism which takes into consideration, and attempts to balance, the many and possibly conflicting goods of different living things (also see Varner 1998 for a more recent defence of what he calls *biocentric individualism* with affinities to both consequentialist and deontological approaches).[8]

Jonas ascribes distinctive importance to man and as he says, man is the only being who is capable of responsible behaviour. Overally he stands on the ground of anthropocentric thinking, but at the same time he criticizes modern western anthropocentrism labelling it "ruthless anthropocentrism".[9] This ethical perspective, which is characteristic of the Greek-Judeo-Christian originated West, not only ignores the interests of non-human beings, but that of the people who live far away in distance (e.g. the third world) and are far away in time (e.g. next generations). „*The apocalyptic possibilities inherent in modern technology have taught us that anthropocentric exclusiveness could be a prejudice and that it at least calls for reexamination.*"[10]

In 1979 – at the age of 76 – he published his masterwork "*Das Prinzip Verantwortung*" "*Versuch einer Ethik für die technologische Zivilisation*". In Germany 200 000 copies of the book was sold and had great influence on green movements. In 1984 Jonas published a partly modified version of his book in English, titled: '*The Imperative of responsibility: In search of an Ethics for the Technological Age*'[11]. In our paper we use this English version. The work generated great interest in French, Italian and Spanish speaking areas, however, its English reception was accompanied by much less interest.

In 1985 his study "*Technik, Medizin und Ethik* " was published, which is now considered a classic in bioethics. In this work he applied his former theoretical achievements to human biology and medicine. His main thesis is that modern biotechnology made man its object and he critically wrote about such questions like cloning, reproduction techniques, and behaviour control. He thinks it is a real threat that the different biological-genetical manipulations may transform

[8] http://plato.stanford.edu/entries/ethics-environmental/#2

[9] Jonas (1984) p. 45.

[10] Hans Jonas (1984) p. 46.

[11] Jonas (1984)

man to an extent that – in the actual sense of the word – he cannot be considered human any more.

In our opinion Jonas doesn't belong to any school of philosophy, because his viewpoints and methods definitely tie him to continental philosophy; however, he applies these methods to issues (e.g. organic existence, scientific-technical acting, the fate of man, etc.) which are alien to the mainstream of modern philosophy. David Levy writes "*I do not know of any other figure in twentieth-century thought who has done so much to redeem the claims of philosophy to be considered a still-vital voice in what Michael Oakshott called the »continuing conversation« of mankind, nor one whose considerations range so precisely and exclusively over those areas that should concern us most"*[12]

In the followings we are going to deal with the book *The Imperative of Responsibility*, focusing on the diagnosis, the therapy of the environmental crisis, and the question of responsibility.

The diagnosis of the environmental crisis from the viewpoint of Jonas

1. Looking out

Several authors in environment-philosophy have pointed out that man's relation to nature is basically different today from the way it was in the past. Analyzing natural resources and the connected human demands, Garrett Hardin in his modern classic *The Tragedy of Commons* distinguishes between abundant and rare commons (natural resources) which are at our service.[13] The established American economist Hermann Daly also distinguishes "empty" and "full world"-s[14]. According to the technology-philosopher Jaques Ellul[15] there is

[12] David J. Levy: Hans Jonas: The Integrity of Thinking. University of Missouri Press. Columbia and London 2002. p.142.

[13] Hardin, G: The Tragedy of the Commons. Science. 1968. December 13. p.1243-47

„*The tragedy of the commons develops in this way. Picture a pasture open to all. It is to be expected that each herdsman will try to keep as many cattle as possible on the commons. Such an arrangement may work reasonably satisfactorily for centuries because tribal wars, poaching, and disease keep the numbers of both man and beast well below the carrying capacity of the land. Finally, however, comes the day of reckoning, that is, the day when the long-desired goal of social stability becomes a reality. At this point, the inherent logic of the commons remorselessly generates tragedy*." (http://dieoff.org/page95.htm)

[14] Daly, H.E.: Stady-State Economics: A new paradigm. New Literary History, 1993. 24: p.811-816 (http://www.feasta.org/documents/feastareview/daly.htm)

[15] Ellul, Jaques: The technological society Vintage Books, New York 1964.

radical difference between the technology of the past and the present. It's decisively because from the eighteen century on technology has been embedded in applied sciences, as opposed to the technology of earlier periods, which was in fact tied to handicrafts. So while the technology of the past was an instrument to mediate between man and his environment, modern technology has become a reality on its own.[16]

This thought is central in Jonas which he connects with the 'altered nature of human action'. First he introduces the practical (ontological) and moral-ethical properties of the archaic man-nature relations and the practical and ethical properties of the modern man-nature relations, then he points out that the latter situation can best characterized as an ethical vacuum.

2. The ancient man-nature relations

About 2500 years ago did Sophocles compose Antigone analyzing the famous chorus beginning "Many the wonders but nothing more wondrous than man."[17] Jonas points out that "Making free with the denizens of land and sea and air, he yet leaves the encompassing nature of those elements unchanged, and their generative powers undiminished. He cannot harm them by carving out his little kingdom from theirs."[18] The "little kingdom", the city is a micro world, a human enclave where we can live in a relatively sovereign way according to our own rules.[19] In accordance with his situation, the ethical-moral views of the man of the ancient era can be characterized by the following properties:[20]

[16] Ellul, J. (1964) p. xxix In his article "The Present and the Future" Jacque Ellul addresses what he sees as the problem of technology as a milieu. According to Ellul our species has known three milieus. The natural milieu, the milieu of society and now the technological milieu. The natural milieu was that of pre-history during which man and nature were one and the same. Society developed as a defense against this natural milieu. Major problems to overcome during this period were; organization, distribution, group cohesion and wars. Gradually a technological milieu has replaced society, alienating man from nature, shaping social groups and interactions.

[17] Jonas (1984) p.2 We shall note that the word 'wonders' doesn't fully reflect what the original word 'deinos' implies about the dark side of the human nature, with its terrible, awesome potentials and power.

[18] Jonas (1984) p.3

[19] Jonas (1984) p.3

[20] Jonas (1984) pp 4-5

I. Nature being an inexhaustible horn of plenty, an indestructible endowment, the idea that man may have responsibilities and obligations toward nature cannot even come up.

II. For the same reasons the fate of the human race or that of certain human communities fall outside of the scope of human action.

III. Thus all contact between the taken-for-granted nature and the taken-for-granted man is to be transacted by the neutral technology (techné).[21]

Following from the argumentations above ethical meaning could only have existed in human-human relations. "Ethics accordingly was of the here and now, of occasions as they arise between men, of the recurrent, typical situations of private and public life. The good man was the one who met these contingencies with virtue and wisdom, cultivating these powers in himself, and for the rest resigning himself to the unknown."[22] This narrow scope of interpretation made it possible for moral knowledge to become available to anybody; it wasn't necessary to be a scholar; being moral and certifying goodwill was enough.

3. The modern man-nature relations

"Now, techne in the form of modern technology has turned into an infinite forward-thrust of the race, its most significant enterprise, in whose permanent, self-transcending advance to ever greater things, the vocation of man tends to be seen, and whose success of maximal control over things and himself appears as the communication of his destiny."[23]

The major critics of earlier science and technology (Rousseau, Horkheimer, Heidegger, etc.) underline those negative effects of technology which have affected culture, man's emotions, morals, and humanity. Jonas' criticism of technology, on the other hand, doubts its allegedly positive civilization effects. Referring to the dangers of military and consumer technology he says: but here

[21] The multiple meanings of *techné* mainly primarily denoted craft, the art of producing something, that is the human ability which follows the law of the creative *poiesis.* The 'techné' is thus a knowledge which makes it possible to man to use devices, machines, or to create works of art. Ropolyi László: Technology and ethics in Kortárs etika. Ed. Fekete L., Nemzeti Tankönyvkiadó, Budapest, 2004. Appeared on pages 245-292. http://hps.elte.hu/~ropolyi/publications/techet.doc

[22] Jonas (1984) p.5

[23] Jonas (1984) p.9

the tantalizing dilemma of modern technology: On the long run, its plough-irons can be as harmful as its swords![24]

In connection with modern technology he emphasizes the following features: it causes irreversible changes (or destructions);[25] it is of cumulative nature and is a parallel way "*the natural is swallowed up in the sphere of the artificial*".[26] On the whole it can be said that the effects of modern technology have grown beyond our scope of insight, so we cannot foretell the problems coming from the production and use of a new device and which may come up in the distant future.

As ethics and morals today have hardly reacted to these ontological changes, a strange, critical situation has come about in which though man have drawn nature under his dominion, his relations to it are still based on those old principles that had evolved thousand years ago. Jonas calls this situation ethical vacuum.[27] Out of this reason does Jonas stress that the changes in technology are to be followed by changes in ethics, the principles of which are the followings:

i) As a result of the rise of the affective potential of human action nature and man himself have become destroyable entities. Accordingly, every acting agent has to consider the consequences of his deeds from this respect, too.

ii) The technooptimistic, modern conception that has identified technology as the tool of development and advance must be reviewed. Similarly, it should be noted that technology is an ambiguous implement and its use may eventually summon the ultimate 'good' and the ultimate 'bad'. According to Jonas technology based on natural sciences is not capable of self-restriction; it can only be forced by an ontologically committed ethics which Jonas terms third-degree-power.

iii) It can be concluded from the above that ethical meaning cannot be restricted to direct human-human relations; it has to include the viewpoints of spatially and temporally far away people, and even those of non-human entities. Consequently, a system of norms should be outlined, according to which any kind of human behaviour is to be considered bad and immoral that offend the interests of 'man' – meaning the overall sense of the word.

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[24] Hans Jonas: (1982) p. 896

[25] Jonas (1984) p.32

[26] Jonas (1984) p. 32.

[27] Jonas (1984) p. 22

4. The philosophical therapy of the environmental crisis

Jonas proceeds from two directions toward the conceptualization of his 'Ethics of the Future', on the one hand from the general characteristics of man and ethics, and on the other hand from the empirical features of our scientific-technological world.

In his views the commandment 'don't kill!' must be incorporated in almost every ethics, because humans do kill sometimes. If human were by nature not able to kill anyone, this commandment wouldn't be part of ethics. Similarly, the reason that the need for a new ethics for the technology-dominated era has come up today is that now we are able to bring about such great devastations, the prevention of which 'moral man' considers his responsibility.

Furthermore it is a characteristic feature of human nature that we sense 'bad' things infinitely more easily than 'good things'. Bad is more direct, coercive and is less dependent on differences of opinion and taste. "*We know the thing at stake only when we know that it is at stake.*"[28] Its doubtful whether anybody would ever have appreciated health without knowing about illnesses, honesty and truthfulness without experiencing cheat and lie, and the examples may be listed further. Hence the new ethics has to deal with the possible wrongs, so that we become conscious of them and can learn what to appreciate. Exactly this is why Jonas criticizes utopias which while setting up disputable 'positive' goals for man, left loopholes for the occurrence of definitively vicious situations.

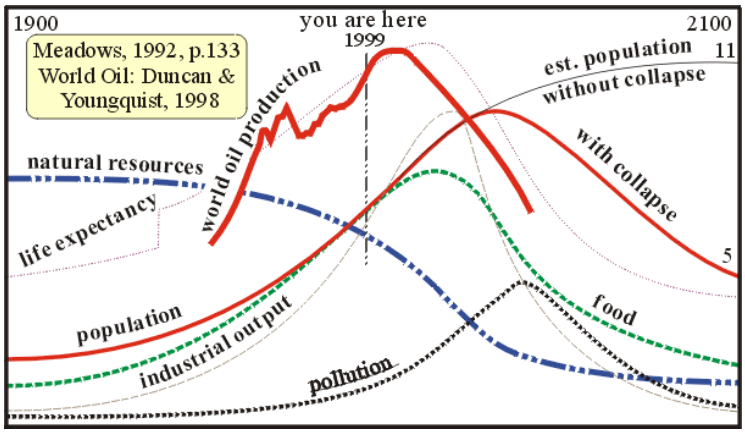
To be able to tell what specific dangers does modern technology bear, for one we need a science which makes us able to foretell the possible long-term effects of technologic action. Jones often terms this desirable science 'comparative futurology'. Additionally he often stresses that the 'principal responsibility' of future's ethics is visualizing the long-term effects and dangers of technology. In this field the first steps were taken by the reports of the Roman Club. *Limits of Growth* was published in 1972 that is 7 years before Jonas' book of German version was published. So Jonas must have known about it.[29]

[28] Jonas (1984) p. 27

[29]

Both the reports of the Roman club and futurologist researches show that the dangers of modern technology include a potential 'wrong', – the possibility of man's future extinction – which means a completely new threat. In this respect Jonas's system is analogous with that of Hobbes in as much as both strive to avoid 'wrong' as such, that is 'summum malum'. Nevertheless, a slight difference is that while in Hobbes the summum malum is the violent death of the individual, in Jonas it is the physical or ideal annihilation of the human race. It is reasonable, continues Jonas, that this imaginary and distant wrong doesn't raise fear in us spontaneously like imminent threat does. The psychology of this is not as simple as it was for Hobbes. So Jones articulated the second obligation of this new ethics, namely a new '*éducation sentimentale'*, the result of which is that the prospect of the ill fortune and destruction of man generate negative emotional responses in people.[30]

In connection with the science of comparative futurology Jonas underlines that the science of forecast demands a higher level of science than what presently is in technology. As technologies in all cases connect to the front-line of science, the possibility of long-term predictions is much more restricted. That is, any kind of prognostications are necessarily uncertain. It is so not only because of epistemological-, but also because of ontological reasons.



These curves are *literally drawn* from the "business as usual" scenario on p. 133, Meadows et al., BEYOND THE LIMITS [see http://www.unh.edu/ipssr/BTL.html] and from the 1997 Duncan & Youngquist's new World oil production model described in THE WORLD PETROLEUM LIFE-CYCLE: Encircling the Production Peak.

As shown in the left corner of the diagram, 20 years later the authors contrasted their forecasts with actual processes. The diagram clearly shows that an overall environmental catastrophe is expected in the first half of the 21. century causing a demographic setback, and a decline in life expectancy.

[30] Jonas (1984) p. 28

As Jonas takes it for granted that the sciences dealing with future can articulate only possibilities, or scenarios as we call it today, he compares the relation between the long-term effects of technological processes and the connected scientific forecasts to a risky game or a wager.[31] The analogy of bet he analyzes some basic situations in connection with the long-term effects of modern technology in depth. For example whether I can risk the interests of others in my own bets or whether I can risk all interests of others in a single bet. In private decisions of course not, but in certain radical situations it is inevitable for political leaders to hazard the fate of even their whole nations. To use the terminology of gambling, a statesman or a community can make a decision like this only to avoid the capital 'wrong', but never to achieve the supreme 'good'. This way Jonas articulates the following thesis: only impeding summum malum and not the attaining of summum bonum can justify in certain situations the radical hazarding of the interests of others in their own interests.

This of course excludes technological risk from the spectrum of valid possibilities. For we take these not to preserve what exists or to relieve the insufferable, but to improve what we have achieved so far, or in other words, in the interest of advancement which aims to realize a worldly paradise. On the basis of all this Jonas formulates the fundamental rule of the new ethics which helps us in our decisions about technological processes and he also articulates its primary principle which supports this rule. The rule says *bad prognosis should be given precedence over good*.[32] The principle which founds the rule says that: "*Never must the existence or the essence of man as a whole never can be made at stake in the hazards of action*."[33]

All this can be illustrated with the following example: in the case of a diseased person even imperfect painkillers must be favoured against promising, radical therapies if the patient may die in the course of the latter. Jonas points out that this rule of decision corresponds to Pascal's wager about the existence of God. According to Pascal worldly pleasures and inconveniencies are negligible if compared to the possibility of our post-death, eternal happiness or damnation. "*The Wager posits that it is a better »bet« to believe that God exists than not to believe, because the expected value of believing (which Pascal assessed as infinite) is always greater than the expected value of not believing.… Pascal's*

[31] Jonas (1984) pp. 34 -38 (III.The Element of Wager in Human Action in Chap. 2)

[32] Jonas (1984) p. 31

[33] Jonas (1984) p. 37 or "Act so that the effects of your action are compatible with the permanence of genuine human life"; or expressed negatively "Act so that the effects of your action are not destructive of the future possibility of such life". Jonas (1984) p. 11.

Wager is also similar in structure to the precautionary principle.*"* [34] The analogy is evident; the momentary advantages gained or missed by way of technology are negligible when the survival or the submersion of the human race is at stake. Thus our decisions in the present should be determined by this future-based viewpoint. (We shall add that the principle of decision arising from the heuristics of fear is for one in accordance with the principle of caution, a term used in environmental protection and, on the other hand it corresponds to the principle of minimax widely used in game theory.)

In the end, Jonas underlines that "*This principle for the treatment of uncertainty is itself not uncertain at all;*"[35] what is more, it is unconditionally obliging provided we agree about taking responsibility for the future. The ground thesis of Jonas is that because of the changed character of human action we can causally affect the future that is it has come under our power, so man as a moral being must take responsibility for the future.

5. The role and importance of responsibility

In the followings we shall present Hans Jonas' interpretation of responsibility. He writes that "*The first and most general conditions of responsibility is causal power, that is, that acting makes as impact on the world; the second, that such acting is under the agent's control; and the third, that he can foresee its consequences to some extent.*"[36] So we can see that the concept of responsibility in Jonas is connected to man's causal power, the formative power he exerts on the world. Out of this comes Jonas ground thesis, namely that human causal power and his responsibility has to be in accordance with each other. For the same reason it is important for man to see forth the consequences of his deeds. The quotation goes on: "*Under these necessary conditions, there can be »responsibility«, but in two widely differing senses: (a) responsibility as being accountable »for« one's deeds, whatever they are; and (b) responsibility »for« particular objects that commits an agent to particular deeds concerning them."*[37]

Jonas calls the first formal- and the second substantive responsibility. Formal responsibility concerns actions of the past (ex pasto facto). Firstly it says the

[34] http://en.wikipedia.org/wiki/Pascal's_Wager ("The *precautionary principle* is a moral and political principle which states that if an action or policy might cause severe or irreversible harm to the public, in the absence of a scientific consensus that harm would not ensue, the burden of proof falls on those who would advocate taking the action." http://en.wikipedia.org/wiki/Precautionary_principle)

[35] Jonas (1984) p. 38

[36] Jonas (1984) p. 90

[37] Jonas (1984) p. 90.

caused damage must be compensated for even if the consequences of the action were not intentioned or foreseeable. The idea of legal compensation long ago got intertwined with the sanctions of morally wrong actions. The difference between them can be properly pointed out by articulating the difference between civil and criminal law, which makes it possible to separate the ideas of 'compensation for grievances' and the 'penalty for doing morally wrong (crime)'. It logically comes from moral responsibility that acting agents try to proceed legally and not to act besides.

Substantive responsibility tends toward the future, toward the things to be done, and it directly tends toward the object of responsibility. As he writes: "*Here, the »for« of being responsible is obviously distinct from that in the purely self-related sense. The »what for« lies outside me, but in the effective range of my power, in need of fit or threatened by it*"[38] The archetype of substantive responsibility is the responsibility of the parents for their children. Children are physically independent of their parents, but are under their control and with the help of this power he has to bring up his children and preserve them – often against their will - in their own existence.

The power of the acting agent, his causal potential over the object of responsibility gives an objective meaning to responsibility, which in ideal cases is complemented by a subjective emotional commitment, the sentiment of responsibility. This sentiment does not originate from the idea of responsibility, but from the rights plus need of the object of responsibility as we percept them. The 'ought-to-be' of the object of responsibility calls the subject of responsibility upon responsible and caring action. Thus the object of responsibility is though submitted to the subject, the actions of the subject are controlled by the needs of the object. The above make it clear that Jonas interprets substantive responsibility as a natural and inherently nonreciprocal relation. Thus he contrasts it with formal responsibility which is mostly the contractual relationship of equal partners. Then he writes: *"Evidently, in moral (as distinct from legal) status, the natural is the stronger, if less defined, sort of responsibility, and what is more, it is the original from which any other responsibility ultimately derives its more or less contingent validity. This is to say, if there were no responsibility» by nature «there could be none»by contract"*[39]

Jonas pays special attention to the responsibility of the politician, because in the collective acting of the present statesmen play an important role in determining the existence and welfare of the coming generations. He describes the

[38] Jonas (1984) p. 92.

[39] Jonas (1984) p. 90.

responsibility of the politician similarly to that of the artist as a special form of natural responsibility. The special character of it is that man chooses the burden of responsibility voluntarily. "*The object of responsibility is the* res publica*, the common cause, which in a republic is latently everybody's cause, but actually only in the limits of the general civic duties. These do not comprise the assumption of leadership in public affairs; nobody is formally bound to compete for public office, usually not even to accept an unsought call to it*"[40]

Jonas knows, of course that power has its own trivial advantages, too, but as he writes "*But leaving aside the most blatantly selfish tyranny, for which the »political« is merely a pretext, it will be the rule that the responsibility going, with the power and made* possible *by it is co-intended in the striving for it, and by the genuine* homo politicus *intended in the first place. The real statesman will see his fame (which he may have quite at heart) precisely in that it can be said of him that he has acted for the good of those over whom he had power, that is,* for *whom he had it. This–that »over« becomes» for«–sums up the essence of responsibility"*[41]

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[40] Jonas (1984) p. 96

[41] Jonas (1984). p.96.

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Wikipedia <Hans Jonas>, <Pascal's Wager>, <Precautionary principle>

Autonomy, Dignity & Genetic Intimacy. Challenges & Legal Paradoxes

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Abstract:

The aim of this article is to point out, firstly, the narrow relationship among the principles of dignity, autonomy and intimacy, from a philosophical and legal point of view, starting from modernity. Next, I am going to study the consequences and analyze some of the implications entailed to their contextualization, in the field of New Genetics. Particularly, when we claim for the right to genetic intimacy and demand the preservation of the right to confidentiality. As we will see in third place, some paradoxes irrupt and certain limitations emerge when noticing that our genetic information is not only personal and privative, but also it has an exclusive character. For the contrary, the genetic resources we have are, somehow, shared with our close relatives, who also can be affected by propensities and pathologies that come from the shared genetic heritage.

Keywords: *Genetic information, dignity, privacy, confidentiality, personal integrity, discrimination, human rights.*

Introduction

The constant development of the biotechnological investigation at the very heart of the biomedicine, particularly regarding to the New Human Genetic, has shown in the latest centuries a vertiginous pace. The new genetic advances cause constant challenges full of possibilities, unpredictable at first sight, but not without some risks, with regard to the protection of fundamental rights. The degree of not only scientific and technical relevance, but also from a cultural and legal perspective is evident.

For this reason, the speed reached specifically in the field of genetic investigation can't remain indifferent to the sphere of human, social and legal sciences. Their ignorance or passivity could turn not only into a great burden but also a dead weight for the scientific development in the medium term, bringing on dangerous emptiness and eventual legal loopholes, with negative consequences for the protection of certain Fundamental Rights, as happen to privacy and genetic intimacy that can become relevant edges of the New Genetic, according to their most immediately legal implications.

After the complete sequentiation of human genome, and before the possibility of accessing its respective genetic information, mainly within the sphere of personal privacy, exactly in that moment our private, personal and familiar life can be transformed into a sort of clear crystal, being exposed to the possibility of a *universal continuous judgment*.

Regarding to this, it's essential to remember that one of the main columns on which the bioethical discipline is settled, is the historical and inalienable principle of autonomy. Principle that becomes obvious in this biomedical environment, that demands the right to privacy, and calls for an own personal and restricted space, that hopes to create certain **opacity**, or a veil of ignorance, in Rawlsonian terms.

To tell the truth, this claim to protect and define **ad intra** the personal and autonomous range, is just a repeated request like a constant cultural feature. But historically, it was since modern age, as we will see more detailed, when the principle of autonomy and the dimension of privacy were presented, developed and set in a regulatory framework.

In fact, the promotion and defence of private life intensely beat in the heart of the notion of freedom in the modern states, and demand their respective legal protection. Freedom, autonomy and intimacy become regulated goods, written law, but at the same time, they aren't free of potential and predictable intimidation. We could say, with N. Bobbio, in a quasihegelian way of speaking, that "History, in short, is the result of the human freedom used as self-

determination, and its object is the human freedom with no obstacles and no constrictions" [1].

So, in the next pages we are going to study thoroughly the close conceptual correspondence of terms such as intimacy, personal autonomy and dignity, and their respective involvement in the range of the New Genetic.

I. 1. The Concept of Intimacy.

The first approach to the concept of intimacy helps us to notice almost immediately that its nature is polymorphic or polyhedral depending on the eye of the beholder. Intimacy means firstly: absorption, introspection, even loneliness and isolation. However, if intimacy were conceived only as a reality kept away of **otherness**, in other words, kept away of coexistence, then intimacy would be dispossessed of social and legal significance.

Actually, the real problem of intimacy "is considered regarding to the external signs or impacts in our private life" [2]. It is worth mentioning its open and dynamic magnitude, among other reasons, because the own notion of intimacy is a cultural, social and historical category, and the risks of attacking this intimate sphere of people, are all around.

We could refer i.e. to the field of work where the chances of work-related discrimination, due to the use of the information obtained without the permission of the workers, about their own biologic constitution, it's no longer a provable or theoretical danger, because nowadays, sadly, it is a dramatic reality in multiple situations. And the trend towards that is clear. The same could be said regarding to the genetic discrimination linked to the insurance field.

It's easy to deduce, consequently, that the access and control to the genetic information, as well as its respective use need to be strictly regulated in order to preserve the genetic intimacy and to protect it with needful guarantees.

In other way, the danger of gradually creating **high-risk groups** according to predictable information that sometimes speaks only of tendency can play a part in the creation of different kinds of alienations: professional, educational, social, with heavy consequences, psychological or affective ones, among others, for the people affected and their home environment.

[1] Bobbio, N., Igualdad y libertad, Barcelona, Paidos, p. 129.

[2] Pérez Luño, A., "Dilemas actuales de la protección de la intimidad", in Sauca, J. M., Problemas actuales de los derechos fundamentales, Madrid, Universidad Carlos III, B.O.E., 1994, Ibidem, p. 315.

That's why the respect to intimacy has special relevance in professional terms, in the field of certain medical specialities, such us gynaecology, psychiatry or medical genetic, and specific problems come up for example when trying to harmonize, in several fields, the fundamental rights of intimacy and information. Besides, it's good to avoid that the interference or violation of personal intimacy could be used to affect, too, negatively to other people with family bonds.

To this respect we could pick up the words of Perez Luño when he warns of the risk of vulnerability of certain essential rights: "There is one practice of proven efficacy to measure the updated rate of different fundamental rights. I rush to admit that this is a dramatic practice: it consists on checking the frequency and intensity in which every right is violated[3]". And the right to intimacy is one of the most damaged.

However, we have to add to what has been said, likewise, that the own concept of intimacy is distinguished also, as B. Knoppers says, for being of indefinite nature. Nowadays the genetic information opens multiple choices of relationship and family ties with ancestors, as well as brothers and descendants. Among these probabilities, shared conditions and pathologies can be found.

Therefore, the discovery and legal recognition of the intimacy as value and right, is relatively modern, because the traditional societies weren't characterized as flexible, neither receptive nor tolerant with the difference. It happened that the honoured and inalterable social and cultural coherence was achieved due the establishment of a "unique" and homogeneous code of values with constant character and without fractures. Actually, all possible means and resources were used, even "the most violent ones, to obtain invariability in the world of value. It's commonly said that in those societies the intimacy hadn't any sense" [4].

For all this and with the object of dealing with this new social and legal reality, is necessary to analyze and study closely and previously, the concept of intimacy from a historical and sociological point of view. The need of intimacy is nowadays settled in a vast period of history characterized by the progressive and radical transformation of individual conscience.

So we are going to stop to exam the close relationship between several known and similar concepts, such as privacy, confidentiality, autonomy and dignity, with their different implications. Later on we will examine in detail, the eventual

Pérez Luño, A.E., "Dilemas actuales de la protección de la intimidad", in Sauca, J. M., Problemas actuales de los derechos fundamentales, Madrid, Universidad Carlos III, B.O.E., 1994, p. 312.

[4] Gracia, D., Prólogo, Sánchez Caro, J.-Sánchez Caro, J., El médico y la intimidad, Madrid, Díaz de Santos, 2001.

interferences and infractions that suffers the right to intimacy, specially the right to genetic intimacy and confidentiality.

I. 2. The right to intimacy.

A retrospective insight allow us to notice initially that from a cultural and religious view, the value of intimacy is more and more present in Protestant countries and specifically in the United Kingdom, since the 17th century. Intimacy related and associated in different ways, to the extensive concept of dignity and property.

In fact, every individual person claims to be owner of his body and mind, and everything that obtains becomes part of his **property**. "For this, the intimacy is the property of the human being and their evidences have to be respected by the established government and the rest of citizens"[5]. So, to go beyond the demarcation line between the public and private spaces, in other words, to meddle in the privacy of every person, is disrespectful and a unmistakable attack against the own subjectivity. The words of Locke are eloquent because mark a political and social direction in some way irreversible.

There is no doubt the sense that the concept of intimacy has nowadays, is closely related to the historical process of cultural transformation experimented by the human conscience since the very beginning of the modern age. In this process the encouragement generated by the religious Counter-Reformation and the rising of the rationalist philosophical culture have achieved special relevance as efficient agents. It must be added the thrust that the ethic-politic proposal generated by the creators of illustration contributes socially, that finally "culminate in the construction of the moral conscience, prepared by Thomasius and finished by Kant"[6].

To this respect we could point out that the cultural universe of **modernity**, where we can include the Aufklärung, before having a revolutionary process, had –as Pérez Luño indicates- as main values in the philosophic field "the Kantian ideals of rationality, dignity, emancipation and cosmopolitanism; as long as in the political-legal field it was expressed in the known paradigms of the "tricolor": freedom, equality and fraternity"[7].

[5] Rebollo, L., El derecho fundamental a la intimidad, Madrid, Ed. Dykinson, 2000, p. 32.

[6] Parejo, L. "Derecho fundamental a la intimidad" in Problemas actuales de los derechos fundamentales, 1994, p. 294.

[7] Prólogo a Llano Alonso, F., El humanismo cosmopolita de Inmanuel Kant, Cuadernos "Bartolomé de las Casas", Instituto de Derechos Humanos, Universidad Carlos III de Madrid, Dykinson, 2002, 15.

In this historic context the dialectical relationship and the configuration of two areas of authority, a public and a private one, are giving rise to a new border line, in which the conquest of personal freedom, free conscience, or religious, moral and politic freedom, is moving forward progressively[8].

Now, beyond the origin and the starting presentation of the sphere of privacy that we have concisely pointed out, the peculiar strain and the dialectical relationship that distinguish the modernism in two different ranges: transparency for one hand and opacity for the other hand, which are increasing, and the citizens set up a double demand to the politic power. They claim for privacy for themselves and for their people, but at the same time, they demand and ask for more transparency in the use of power.

In this way, the citizens force the politic power that have been democratically elected and represent them, to show the maximum control with regard to the exercise of their political activity. But at the same time, the power try to fulfil and try to make extensive the same right, and it is disposed to apply vaguely and wickedly that principle to the own citizens, with the intention of revitalizing, watching over and guaranteeing the safety of the citizens.

Obviously, that propensity is just, on the other hand, a continuous source of eventual problems, because it finally leads to the use of several domination and retreat strategies, because the powers that be use to fall back and to close their minds in a concentric way, acting with more and more opacity.

For all this, the stress that the citizen suffers is growing progressively, and that pretension, as a last resort, struggles with the principle of privacy. It's worth talking about a serious difficulty, which appears in democratic societies and face up to two positions, contradictory at first.

On this context, the respect to privacy and the promotion of the personal intimacy are exposed to permanent hostilities. In fact, the risk of suffering a close control, stimulated and promoted by the established power, has been, in several ways, a historical constant. So "indeed, it turns out that the perfect dictatorship is an opaque man that rules over transparent beings" [9].

In regard to this it has to be detailed, however, that the Democratic Constitutional State is legitimized, nowadays, as long as it makes possible and respects the development of the personality of every citizen in one framework that includes wide freedom range. So, once the social and politic pluralism has

[8] Béjar, H., El ámbito íntimo. Privacidad, individualismo y modernidad, Madrid, Alianza Ed. , 1995, p. 16

[9] Malem Seña, J., "Privacidad y mapa genético", Rev. Der. y Gen. H.,1999, p. 200.

been historically secured and reinforced, it's needed, as Rebollo states, to strengthen the moral pluralism, by admitting the "objective singularity" [10] and by making it widely accepted, giving it legitimacy. There, is where the extensive and malleable universe of tolerance and their legal branches are registered.

This way, the unmistakable and urgent need of counting on the respective guarantee and protection of the several legal systems is born. As we are going to see later, the legal approach to the right of intimacy reveals both conceptual complexity from a theoretical perspective and the difficulty in putting it in practice on unlike conditions.

From a sociological point of view it could be said, besides, that the citizens are disposed to throw themselves and fall back to their individual condition when they live in settled democratic organizations or structures and they have certain standard of living and development. They are worried less about the matters related to "res publica", and more about aspects connected to the progress and situations of their private life.

In this process, the inner world is becoming a privileged and specific space. This space is also the ground that holds intimacy, but the risk that can come up is the temptation to be reduced to a field near the thoughtfulness or absorption, that is, solipsism. That's why is needed to open and include, additionally, the aspect of socialization. So, we are talking about external exposure, social exposure, this is, externalization in those actions that involve "legal capability" [11].

This external dimension of intimacy comes from its own concept, because as a last resort, it is "a cultural, social and historical category. This opened and dynamic dimension of intimacy is confirmed, in its legal version, from doctrinal, legal and jurisprudential postulates[12].

We could say that this aspect would be the new Social Contract that nowadays leads the socio-political relationships, being, in the one hand, the field of politics, the legitimate holder of power, a democratic one, freely elected, and in the other hand, the citizen that fall back to his own personality, the citizen that hopes to live his whole individuality without accepting restrictions.

[10] Rebollo Delgado, Ibídem, p. 21.

[11] Pérez Luño, A., 1994, p. 315.

[12] Pérez Luño, A., Ibídem

The intimacy really means, as we will see, a main and decisive feature of the human life, a specific one. As states R. Dworking regarding to this "is as important to live according to our freedom as the fact of having it" [13].

II. 1. The legal conceptualization of intimacy.

It's easy to verify, as has been exposed, how the right to intimacy has developed, in the short term, a remarkable metamorphosis and evolution. This continuous change that began in the modern age has become apparent in different ways and has affected to "its technical-legal structure and to its field of protection[14]. And it's not strictly a semantic matter of language.

Th. Adorno warned clearly against the special relevance that comes by the proper use of linguistic terms, when they are applied to ambiguous realities, and reminded us that the use of the language is too, sometimes unknowingly, the correspondent weltanschaung or ideology. Because of this, is truly important the highly precision, nowadays, of the meaning of several related concepts.

The problem that can come up later is that the ambivalence and the lack of accuracy in the respective texts may turn up furtively and come to interfere negatively the specific interpretation and the required efficacy of legal channels, which are referred to the protection of values that need to be watched[15].

This risk is a constant and evident feature, in our case, according to the concept of intimacy, what shouldn't surprise us, because sadly, it seems as if an onerous tribute must be paid for the use of the most recurrent and frequent categories in the legal theory, because recurrently they suffer from a clear "shortfall in their conceptual purpose that is inversely proportional to the expansion of their use"[16].

In fact, we are in these days, as Pérez Luño says, before the same difficulty, because the notion of intimacy is really used in few frames of references, "with a high grade of indecisiveness and ambiguousness that make difficult to specify

[13] Dworkin, R., El dominio de la vida, Barcelona, Ariel,1994, p. 313.

[14] Gay Fuentes, C., Intimidad y tratamiento de datos en las administraciones públicas, Madrid, Ed. Complutense, 1995, p. 21.

[15] Ibidem, 1994, p. 313.

[16] Ibídem.

their sense and legal range"[17]. According to this, it's needed to analyze its especial meaning. Let's see it closely.

The term **intimacy** etymologically comes from the adverb **intus**, which means inside, that derivates from the Greek **éntos**. In Spanish we have the comparative **interior** (more inside than) and the superlative **intimus** that means, as remind us Sanchez Caro, "the deepest"[18]. This is the suitable original meaning of intimacy.

In other languages it's easy to see v.g. in the broad English-speaking bibliography on the subject, that the English term **privacy** prevails over others such as **intimacy**, referred mainly to the close relationships, sometimes sexual ones, or over **intimate,** with an infrequent use. In Spanish, we could say that the term **intimidad** (intimacy), used mainly in several situations, refers to a greater or lesser extent to a reality that is different from the field of both privacy and confidentiality, despite their close concordances.

Other different topic could be its later conceptualization and the respective preparation and theoretical construction of the concept of **intimacy**. From another point of view, its social demand as a right depends on the structure and configuration of the own society, because, as warns Parejo, it's easy to verify that we start from the difficulty in "the legal conceptualization of intimacy, and its dependence on the current concepts and ideas in every historical period, and the difficulty in its variable and evolutionary character[19].

Well then, we could say firstly that privacy is set, in the field of building up individuality, as the space that makes easier the growing of autonomy and the promotion of personal autarchy. This way is how the **own ego** is developed, the single individual personality. Privacy is also built as a region of creation, personal creativity, in where the individual learns to grow and develop his own talents and abilities.

Besides, it must be said that **privacy**, as Béjar says, is set as an exceptional space of freedom, where the subject can move away from external pressure, can live apart and can be a temporary critic, in a positive or negative way, in other words, can be free.

Finally, the privacy would be also, ad intra, the condition or requirement for creating a new level of human relationship, a deeper one, that we can call

[17] Pérez Luño, A., "Dilemas actuales de la protección de la intimidad" in Sauca, J.M. Problemas actuales de los derechos fundamentales, Madrid, 1994, p. 313.

[18] Ibidem, 2003, p. 210

[19] Parejo, L., "Derecho fundamental a la intimidad" in Problemas actuales de los derechos fundamentales, 1994, p. 296.

intimacy[20]. In other words, we find several concentric circles and "intimacy is a more restricted concept than the one used to define the ambit of privacy"[21].

On the other hand, intimacy is frequently linked to the concept of personal **autonomy**. In fact, the **personal integrity** makes reference to the protection of the people's inner sphere. That integrity is settled over the right to autonomy. But it's essential to specify that, despite its proximity or affinity to intimacy, it can't be properly considered as "a synonym of autonomy. This way, **the right to intimacy** is a right that involves a restricted accessibility, and it would be hazy to think that this right could be reduced to a right to be free to make something or to a right to act independently[22].

But it's important to distinguish between the terms "intimacy" and "confidentiality", because, although they could be considered as brands that define close and common ambits, nevertheless, they are really different concepts that refer to different realities.

The **intimacy**, as Sanchez Caro warns, is referred to the restricted access to the own body or the own mind, "as happens through the physical contact or the disclosure of thoughts or feelings; usually it's thought that it's something that people want to preserve, protect and retain". When we talk in terms of **confidentiality**, we are referring precisely to a kind of relationship between, for example, in the field of the medical profession, doctor and patient in the course of their communication.

II.2. Intimacy and dignity.

We couldn't end this part dedicated to specify legally and conceptually the right to intimacy, without making specific reference to the close bond with the principle of dignity. As it's frequently repeated in occidental culture, "there is a key word, beloved for philosophers, jurists and bioethicists: **dignity**"[23]

The association between intimacy and dignity, as we will se, leaves little room for doubts. We could say that this link is accepted and is commonly used,

[20] Béjar, H., 1995, p. 156.

[21] Carrillo, M., El Derecho a no ser Molestado. Información y vida privada, Pamplona, Thomson-Aranzadi, 2003, p. 20.

[22] Sánchez-Caro, J-Sánchez-Caro, J., "Evolución y fundamentos del concepto de intimidad. Aspectos bioéticos y jurídicos" in Gen-Etica, 2003, p. 207.

[23] Francesco D´Agostino, Bioética. Estudios de Filosofía del Derecho, Ed. Internacionales, Madrid, 1998, p. 59.

without questions, but now we prefer to explain it, although shortly, putting it into words to exhibit closely that alliance.

Firstly, it is worth mentioning that intimacy is a right closely linked to the personal autonomy and dignity of people, because the respect to the space that the own personal freedom has make up as "unavailable space, is a personal dignity's manifestation"[24]. Intimacy keeps a close relationship with the field of internal freedom, or negative one, as I, Berlin defined it. We can point out that autonomy and equality are specific and essential components of the human dignity, the same that the respect to all that could affect the human body.

Being the corporal intimacy the closest and most immediate field that flies around personal intimacy, it is set as an insuperable space and, therefore, "especially immune to the juridical-political relationships, against all interference to the human will"[25].

Of course, if we want to capture the principle of dignity's current sense, we must cast a retrospective look to understand the course followed by this exceptional but controversial principle. This way, it will be easier for us to know and also contextualize the process that has followed to its present meaning.

It must be initially stated that if we are speaking of human dignity, the key instant of its awareness is set in the beginning of the modern age, concretely since Kant, the human dignity is built as a reaffirmation of their own moral conscience, as an indicator of free will, as a declaration of their own autonomy.

So, since Kant, dignity has become the dominating moral dimension of personality, because human dignity is precisely "a work of the human being… a valuable self-affirmation encouraged by the respect to the moral law"[26]. In this sphere of autonomy is set the actual notion of intimacy, which is progressively demanded, as we are saying, for a growing number of citizens.

Maybe no one but Kant, in modern age, could clarify more precisely that new mentality, specifically defending the growing of autonomy against the dependence that goes with the heteronomy. Because his proposal, expressed in several ways, is unmistakable: the willing of a rational being must always be considered as a legislative one, because, in other way, the rational being could evaluated himself not as a purpose, but as an instrument, with another value,

[24] Carrillo, M., El Derecho a no ser Molestado. Información y vida privada, Thomson-Aranzadi, 2003, p. 33

[25] Parejo Alfonso, L., "El derecho fundamental a la intimidad" in Sauca, J. M., Problemas actuales de los derechos fundamentales, Madrid, Universidad Carlos III, B.O.E., 1994, p. 303

[26] Parejo Alfonso, L., 1994, p. 295.

with another aim. Therefore, the reason is autonomous according to the idea of the **dignity** of a rational being that doesn't respond to any law but the one that he has given to himself.

Dignity becomes an over the top reality, with a prevalent character that turns into the highest value of the human being, with no correspondence and priceless. Valls[27] defined it as an imprescriptible right that can't be waived, because as subjects, we are masters and sovereigns, as a result, we are agents, no patients.

Our dignity, not involved with heteronomy, lies in the power and capability of giving to ourselves the law that respects the freedom for all, with universal character. We are, for all this, mainly, autonomous beings.

It's clear that the principle of dignity, we must remember, hasn't to be considered, however, as an invention of the modern age. In previous ages, that principle had existence and was admitted in moral and civil fields. There is no doubt about the remarkable evolution that has progressively experimented until today.

In Classical Times, for example, in Greece and Rome, only those people who could exercise publicly their freedom were considered honourable, because of their decisions on hard situations or because overcoming conflictive situations. However, that quality and recognition was reserved only for a few of their members, not all of them.

Dignity turned up, sociologically speaking, to distinction, in other words, an excellence of those whose virtue (areté) stands out among others, because they were aristoi, aristocrats. On the other hand, dignity deserves not only social recognition, but also goes with public responsibilities, because those who had it were worthy enough to hold positions with **authority**.

For all this, dignity wasn't a universal quality accessible for everyone. Otherwise, dignity was considered not only a distinctive quality, because it was also used to separate, divide and organize into hierarchies the society.

It must be emphasized, as **Valls** says, the social aspect of dignity, because almost all the terms related to it belong to the moral field, obviously, but more in a social way than in an individual one. This is the version and interpretation of dignity in ancient times, totally different to its current meaning.

In fact, opposite to the ancient privative conception of dignity, only for some citizens, in modern age, a new principle comes up, equality, with a different character and dimension, because is considered with an open dimension of

universality. Since the inclusion of this principle, we all have dignity first of all, so we are **equally** worthy enough of the same respect, because we aren't slaves nor servants of anyone, but masters of ourselves. We have dignity because we are free.

However, we have frequently been witnesses of the expression of different positions, sometimes conflicting ones when referred to the principle of dignity. It's easy to see contrasting exegetes, which represent and defend differing interpretations when they speak of the same term: dignity.

We could mention the discussion that has been carried out about the position and expectations of frozen embryos, or the controversy around the potentially of the therapeutic clonation, or eventually regarding to the beginning and the end of life. Obviously the concept and basis are clearly different, sometimes totally opposed.

The question is unavoidable, ¿how is it possible that, from the same principle - **human dignity**- could come interpretations and consequences so diverse and occasionally opposite? It's really hard to mark the meaning and the exact range of the principle of human dignity, as we have said[28]. But it's always surprising, as E. Fernández says, the amount of times that the principle of dignity is summon from different positions, even contradictory, for holding up religious proposals, in the fields of morality, politics and legality.

That excess or abuse of the term causes that confusion or conceptual and terminological vagueness grow around it. Besides, it helps to a progressive depreciation of its relevance, and finally, the "risk of turning it into an amorphous and empty expression"[29], emerges as a consequence.

After this difference, it's easy to verify the existence of several **conceptions of the human being** underlying both interpretations, and also according to their relationships with the rest of the human beings. The distance is vast and forms, on the other hand, as it's known, the ground from where comes out the new culture that inaugurates the Modern Age. That culture admits and claims the position of the man in the universe, and raises it as the leader of their own destiny, as were said in the Renaissance.

Today, the principle of dignity, after its historical evolution and the new generation of the Human Rights, beyond their individual side, opens a track, as it's known, to new fields of demands related to certain countries or to a rights to

[28] Fernández, E**.,** Dignidad humana y ciudadanía cosmopolita, 2001, p. 25.

[29] Fernández, E**.,** Ibídem, 2001, p. 18.

development, and new fields of equality among human beings, including women and their social integration, solidarity, respect to nature, etc….

After the invocations and formal declarations, new concrete questions and more precise situations appear, bringing the rational analysis, and then, comes the withdrawal that prevents the access to the effective realization level. As E. Fernández says, the content of the principle of "dignity demands always be redefined, because it's constantly exposed to the risk of some kind of implosion, which could empty it totally from inside and could convert it in facade"[30].

Again, the dialectic strain between formulation and invocation, and the realization and respect to human dignity, on the other hand, can`t be neutralized or confined to a certain model eventually unilateral neither restricted. It also can't be statically attached when calls for the principle of immutability of the individual and his nature. As Knoppers says, the realization and respect of the human dignity can be restricted to one conception of the "natural law" of the individual, neither fixing the genetic immutability of humanity nor a unique right although it is the inviolability of the private life or freedom[31].

To this respect it must remembered that the Declaration of Dignity of the Council of Europe, signed in Oviedo, not only proclaims, but also commits the signatories states to integrate in their systems of law the content of the articles that form it. That Convention establishes in its preamble "The member States of the Council of Europe, the other States and the European Community, signatories hereto, conscious of the accelerating developments in biology and medicine; convinced of the need to respect the human being both as an individual and as a member of the human species and recognizing the importance of ensuring the dignity of the human being; conscious that the misuse of biology and medicine may lead to acts endangering human dignity; affirming that progress in biology and medicine should be used for the benefit of present and future generations…"

And also in the field of the biotechnology and human genetic must be said, taking words from Bobbio, that despite the eventual theoretical relevance, the most important and decisive factor is not the intellectual reasoning process used to argue and find more reasons in one side than in other at the moment of specifying or funding the human rights, the most important factor is their protection. And for doing this it's not enough only with euphonic proclamations. We are talking, in practical terms, of efficacy and, consequently, realization.

[30] Francesco D´Agostino, Ibidem, p. 59.

[31] Borrillo, D., Genes en el estrado, Madrid, C.S.I.C., 1996, p. 209

But we must come back again to the topic that concerns us: the close relationship between the principles of dignity and intimacy, and then we could enter, specifically, in the ambit of intimacy and genetic confidentiality. We could say after we've said that, nowadays, there is a well-known and appreciated fundamental principle in every society really disposed to guarantee and promote the respect to human dignity: the principle of intimacy. This principle carries out the function of a veil that set us free from others' prying eyes, that tends to hide the vital perimeter of our behavior from others. This principle hopes to certain opacity.

Sadly, from a legal point of view, it's true that, apart from the last Conventions and Declarations, the International Law hasn't spoken about or considerate more precisely the concept of dignity. It's the same dignity that forms an axiological fundament and an underlying basis because it's considered that **human rights** come from it[32].

On the other hand, if we analyze the constitutional texts of the countries members of the European Union, we could quickly notice that they assume the human dignity, because all the admitted rights in those legal systems known as human rights, as Iglesias says, "are summarized in the same human dignity"[33].

In the Spanish constitution, dignity takes a privileged place among all constitutional principles, as is shown for example in the art. 10.1: "The dignity of the individual person, its unalterable and inherent rights, the free development of the personality, the respect to the law and the others' rights are foundations of the public order and social peace"[34].

We can see how the defense and protection of the individual private sphere in actual society requires the gathering of the lawmaker and the rest of public powers in a permanent effort to deal with the several fronts and contexts on which "the individual intimacy can be threatened from the public sphere"[35] by the state powers or institutions or by private companies or institutions, mainly economic ones, as we will see.

However, we must warn that, despite the progress experimented in the legal field, the principle of individual intimacy related specifically to the genetic

[32]Knoppers, B., Dignité, p. 82.

[33] It remembers the autor of La protección jurídica de los descubrimientos genéticos y el Proyecto Genoma Humano, Madrid, Civitas, 1995, p. 91.

[34] Romeo Casabona, C., "Protección de bienes jurídicos y genoma humano" in Borrillo, D., Genes en el estrado , p. 144.

[35] Carrillo, M., Ibídem, 2003, p. 23.

assignment, calls for some additional precisions referred mainly to the use that can be done with this information and the relevance that it may have in the context of privacy and communication, the principle of confidentiality.

It must be specified that, if the human dignity implies the unceasing respect to his freedom as an exercise of his full autonomy, it will be necessary to ask openly if the deployment of the personal freedom admits or exclude some kind of limitations, because the own notion of **genetic information** is, in some way, of a vague nature, undetermined even controversial as we will see later.

III. Genetic intimacy and confidentiality.

Unlike the most part of the medical information, the genetic information is not limited to only one person, because it reveals data about the biological relatives, and can cause possible consequences for the descendants, which is even more problematic when we speak of a feature or a predisposition to develop a genetic affection that doesn`t have successful treatment[36].

Acording to the use of the genetic information, important questions, as we will see, come up, such as: the right to be informed, the right to intimacy, the medical secret, even the right, admitted by the Biomedical Convention of the European Council, not to know[37].

Paradoxically, through the appeal to the genetic we are confirming and admitting that, in one way or another, we are no so independent, we aren't nomads or autonomous people, we have, respectively, a lot of information about each other. There is no doubt that illnesses of genetic origin affect mainly and principally to the patient that inherits and suffers this legacy. They affect him personally but, more precisely, the correspondent pathology doesn`t concern only to him, because can affect to other members of the family and eventually, to future generations.

According to this, some authors consider that when patients with genetic illnesses are involved, the concept of patient should be extended to every member of the family, and shouldn't be restricted only to the person that decides to make genetic analysis, because all the members of the family could be considered as potential carriers.

It's important to say, therefore, that when we speak of genetic information, we do it not only in terms of privacy and personal autonomy, but also making

[36] Roscam H., "La información genética y los derechos de terceros ¿Cómo encontrar un equilibrio?" Rev. Derecho y Gen. H, 2,1995, pp. 35-54.

reference to other principles in danger, for example, the principles of responsibility and solidarity.

The same concept of **intimacy** has, in some way, a polymorphous and protean nature. In fact, analyzed from this new point of view, the genetic information opens several possibilities of familiar bonds and links. As Knoppers says, the traditional principles of the individual intimacy such as the right and protection of the personal relationships, physical integrity, etc…, free and with no interferences, should be revised and considered "in the context of the human genetic to personal, familiar and social levels"[38].

As it's obvious, the genetic individuality corresponds, in biological terms, with the "fenotipic expression of a person in a family, in a culture and in a given moment, with his tendencies, predispositions and individual risk factors". It could be said that the genetic information ends up being "necessarily familiar or transgenerational"[39]. In other words, it's needed to admit that the right to intimacy is not a right that could be considered as prevalent or absolute, which could be set, on unconditional terms, over the rest of the rights[40].

Sometimes, situations and complex circumstances that end up breaking individual rights and familiar or social rights come up and demand the exercise of certain equilibrium between them. A hard task always difficult but, on the other hand, not infrequent when several fighting rights are considered[41].

There is no doubt that it's really difficult to establish and delimitate exactly the division line that allows to state the field of protection of every one of them. More complicated, one more time, is specifying and concreting, in every situation, the prevalence opinions among the respective principles involved.

All this make some authors defend that in this new context created for the development of the New Genetics, the traditional norms of confidentiality and access to the information, and the correspondent obligations or interfamily exemptions, "are going to need a reformulation and differentiation from another concepts of intimacy inside the family context[42].

[38] "Hacia la intimidad genética" El Derecho ante el Proyecto Genoma Humano, Vol. 1, 1994, p. 387.

[39] Knoppers, B., Ibidem, p. 388.

[40] Cavoukian, A., "La confidencialidad en la genética: la necesidad, el derecho a la intimidad y el derecho a "no saber" in Rev. Der. Gen. H., 2, 1995, pp. 55-69.

[41] Cavouikan, Ibídem, p. 69.

[42] Knoppers, B., Ibídem, p. 388.

It's clear that the process of revealing and divulging so personal and intimate aspects, such as the result of genetics tests, would lead to violate openly the right to intimacy. But sometimes, there are special situations, for example, in the time to examine the biological tests related to determinate the affiliation, where this right can give in to the right of the son to know their ascendance, which is considered a higher good[43].

Logically, the curse of the dividing line among fundamental rights is conditioned, in this case, for the use and spreading degree that is pretended to be made according to the results of the genetic tests[44]. But again, it's necessary to consider conflicting principles, to verify contrasted risks and to control opposite benefits. We could deduce that "one more time the norm whose application raise the benefit and reduce the danger, should be adopted".

In some way it could be said that the main legal problem that comes up according to the confidentiality of the genetic information, could be concreted and reduced to the formulation of this alternative: the individual right to genetic intimacy against the public right to auto protection against delinquency and illnesses.

According to the right of intimacy of the patient that has have a medical examinations, it's necessary to say that the confidentiality is really a fundamental norm, compulsory in the clinical exercise but, as Fletchers warns, "it's not absolute in medicine and medical genetics". In other words, it must be relativized and interpreted according to the circumstances that come into play, and the different casuist that may occur, as we will see more detailed next.

It might happen that if the patient, for several causes, insists on refusing to reveal the possible existence of an evident threat for his relatives, the moral imperative of avoiding potential dangers to other people, would limit and determine the duty of confidentially of the doctor. It may happen, for example, with the existence of epidemics or other specific situations that involve unpredictable risks that are difficult to objectify, but are a danger, and the general good must prevail over the individual good[45].

Because it's a common practice not to give information that may be considered as inappropriate or no relevant from the medical point of view, unless it is expressly required, there are, however, as Roscam specifically says, some

[43] Zarraluqui, L., "Pruebas genéticas y matrimonio", El Derecho ante el Proyecto Genoma Humano, Vol. I, Fundación BBV, Bilbao, 1994, p. 436.

[44] Zarraluqui, L., Ibídem, pp. 432-433.

[45] Zimmerli, W.Ch., "Aspectos éticos del problema jurídico de la confidencialidad", El Derecho ante el Proyecto Genoma Humano, I, Fundación BBV, Bilbao, 1994 p. 438.

generally accepted exceptions to the right to be informed of the person that is subject of genetic tests.

So, it may happen, firstly, that the possible danger that the information of the person could cause is so significance and transcendental that eventually justifies the withholding of that information. We are talking about the so called "therapeutic exception" that occurs in extraordinary situations, because at first, it must be pointed out that, generally, the right to be informed prevails.

Obviously it's necessary to conclude, finally, that we are faced with controversial but infrequent, almost exceptional, situations. For this reason, authors such as Roscam consider that there is no need to go so far, to the extreme of regulating the conditions on which the "duty conflict" should be applied, because if, firstly, it might be thought that the eventual advantages that could be derived from the praxis of the geneticists, taking into account that those applications would add "legal clarity", however, the respectively legal regulation would be finally "contrary to its exceptional character and its applicability only in concrete individual situations"[46].

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[46] Ibidem.

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Global Bioethics and Cultural Anthropology

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Abstract

Global bioethics adds challenges to interpretation, procedures and assessment on new technoscientific advances on biomedicine and the unequal distribution of health services around the world. Complexity asks for improve interdisciplinary relationships and in this paper is described how Cultural Anthropology while keeping a critical eye on universal ethics, also attends glocal requirements for sustaining human rights in particular situations and cultures. Fusing anthropological knowledge and aims within Global Bioethics means to stimulate action and contextual viewpoints that are depicted as situated, dialogical and prospective bioethics. Finally, a brief ethnographic exercise shows the interest of foresight and collaboratory assessment to connect research and society and to improve public debate.

Keywords: *intercultural relativism, human rights in action, dialogical and prospective bioethics, ethnography for bioethics, observatory and collaboratory.*

Intercultural relativism: Discrepancies and Links

Of all the disciplines found in the interdisciplinary environment of bioethics, the one quoted least is Cultural and Social Anthropology, which is hidden below the expression 'to mention a few'. Yet Bioethics has slowly entered into the field of anthropology, both as the subject of studies in research institutions and hospitals, and the professional environment of bioethics committees and observatories.

These belated inclusions are not only due to the pre-eminence of moral philosophy and law in establishing Bioethics, but also to discrepancies in the content of epistemology. While Bioethics opts for universal ethics, Anthropology is guided by a cultural ethos, i.e., the particular values of cultures. These discrepancies are rooted in the same ones that were defended for many years by the Universal Declaration of Human Rights, particularly from the late 1940s, when Anthropology rejected every project of a universal type that applied regulatory judgements to particular cultural practices.

The purpose of traditional studies in Anthropology focused on communities whose cultures had suffered from processes of colonization and those that were forced to accept systems of ethics being forced upon them by hegemonic countries. Whether these were religious, legal or ideological, they served to justify the expropriation of land and resources, breaking the will of the local population and excluding other systems of values. From this appreciation arose a Statement for Human Rights in Cultural Anthropology, drawn up by Melville Herskovits and made public in 1947, and which was soon adopted by the American Anthropological Association as a framework of ethics to fight against racism and for freedom and dignity of Indian communities and linguistic rights. Coinciding with this, UNESCO consulted with Herskovitz, as an authority on comparative studies of cultures, to draft the Universal Declaration of Human Rights published in 1948.

In Western thinking, human rights are linked to the learned idea of emancipation, and particularly to the Declaration on the Rights of Men and Citizens (1789). However, the universal and individualistic nature which distinguishes the rational protagonist from these principles, clashes with Anthropology when this is regarded as being a descriptive science on social processes and practices observed empirically and which therefore reveals differences regarding ways of understanding and contextualizing human values and rights. Instead, ethnography, as a support for comparing the rules and values in different cultures, guides anthropological theory construction through cultural relativism.

Cultural Anthropology is keen to ascertain how societies make their norms and values and keep their moral principles and feelings to rationalise and sanction ways of behaviour regarding life and death, order and disorder, what is normal

and what is not, health and illness. Whether in the form of ideals or sanctions, or in the form of original myths or moral discourse, all cultures constitute a narrative of what they are and their place in the cosmos. This vision of the cosmos is built upon the pillars of the ego, the other, time, space, causality, and cultural meaning is constructed by using values and rules on behaviour which dictate the actions and attitudes that are compulsory or virtuous, and why they are good or bad as regards reproducing and keeping life. These are principles and arguments which serve to sustain beliefs and simultaneously legitimise moral order and control society.

Anthropology, when referring to these cultural constructions, does not focus on the structure of what must form a universal principle of ethics, but rather the systems of underlying values, the *ethos* of each society. So, while for some societies what is good is that which simply favours long life and leads to happiness, in others prevail the belief that there is nothing good or bad per se, thus values, attitudes and judgements depend on the context of experience, and yet, in others, the moral ideal is the existence of a clearly drafted strict legislation, administered the same for all, though this does not mean that special rules may not be established and applied to certain persons and social groups according to particular situations.

Consequently, cultural relativism recommends not to prejudge the ways of behaviour which describe a society. Therefore rules and values must be understood in terms of relationships established within each culture without imposing interpretations from preconceived and standard analytical frameworks.

When making a comparative analysis of cultures, cultural relativism favours the idea that moral values are not unmovable absolutes, but constitute a set of references from which different societies take ideas, prescriptions and preferences. However issues regarding whether moral values may be validly detached from their cultural context and compared with other cultures and whether these values are related or applicable to one society or another remain open.

In the words of Herskovits (1973) experience in ethnography teaches us that moral and ethical systems vary in their form and content, and the values which back these up stem from plural identities and belongings. And all this requires to regard densely upon description, before passing on to a prescriptive solution as represented by the universality of human rights. Without situated descriptions, Human Rights Declaration' ethics does not exactly reflect a set of universal moral facts. Taken to the extreme, it could even be regarded as a declaration of intentions made by the international community, which could involve – unspecified - interests to reshape societies following preferred rules and lifestyles. And since these concepts come wrapped in such cosy qualities as democracy, liberalism, flexibility, autonomy, privacy, it would not be unusual

for these to end up being signed and their use to be limited to a purely rhetorical one. So this would just be a new style of colonialism imposed in other ways since it denies or ignores the ideas and values of other cultures, and thus affects diversity and dignity which they so wish to protect.

And recalcitrant relativism could even state that if the rhetoric of Human Rights advocates defending human diversity and cultural pluralism, it will not easy to reconcile competing arguments regarding the purpose of life, freedom, justice, and equality among others.

Widening ethnographic knowledge on different ethical frameworks and going into greater critical depth, Anthropology has also evolved and raised doubts as to prioritizing the truth of the Other and the ethical properties of ethnography when representing this Other, since cultural essentialization may be turned into anthropological fiction. And this new sensitivity for moral problems led anthropologists in the 1980s not only to find inconveniences in cultural relativism conceptualisation but also carried out systematic criticism (Geertz, 1984; Spiro, 1986).

Now, anthropological interest for the Universal Declaration of Human Rights basic principles focuses particularly on equality before the law and human dignity secularisation in order to promote legal actions and policies of cultural emancipation (Goodale, Cowan, 2006). Throughout the 1990s, the American Anthropological Association called its members to attend annual international seminars and meetings on this theme and created committees to offer advice on the violation of human rights on Indigenous people and marginal poverty. And its journal, American Anthropologist, offers a special edition on Human Rights in 2006.

After all, there is academic acceptance of Human Right's principles, applications and effectiveness while keeping in mind contextual distinctions and shifting notions since violating human rights does not have the same moral, political and legal meaning in all places.

The cultural construction of bioethics

Thinking of bioethics in terms of anthropology stems from the link between nature and culture and centres on the problem of substituting the natural order for artificial quality of human design. This is a problem which raises ethical issues upon the means and the aims of knowledge, relationships of power and their implications for human life, the environment and society.

Having said that, it is not advisable to understand the concept of culture in terms of the old standard and canonical sense since it would then lose the heuristic flexibility which all reasoning and practices need to engage current social

problems. So culture is not just a system of knowledge, a set of static norms and shared meanings, a traditional social organization sanctioned by history, but rather an instrument, a practical system of knowledge, used to solve problems and build new realities in accordance with situational demands and interests. Cultural reality is based on changing practices and decisions which, in addition, are of a diverse, reasonable and interested kind; they are guided by several values, both by pressure and obligation, independently or preferentially, apart from the fact that these aims are not always set, but occur randomly.

Likewise it is necessary to overcome certain atavistic conceptions of science seen as a refuge of rationality and capable of providing an answer to all problems. There are additional obstacles coming from that science and technology work at in parts and variables to which they put down to partial definitions of human nature and its problems. And this clashes with the social and cultural appreciation that life and social reality do not work in fragments nor do the problems fit together like in a chain, but rather constitute vital actions which form relationships and responses of great complexity.

And the difficulty of thinking Bioethics in anthropological terms stems from prioritizing the formal aspect of problems and ignoring the cultural and social context. Ethics and Law share the problem of how to apply general rules to particular cases and to this Anthropology questions the application of abstract ethical principles in terms of rigid principles and formal protocols which promote paying less attention to the variability of situations where illness and experimentation are found. Hence the severe criticism, such as Kleinman's (1995), who points out that bioethics adapts to the biomedical model of illness which overlooks the therapeutical triangle along with casting aside the patient who is suffering.

And if, furthermore, Anthropology positions itself to safeguard the plural cultural ethos though this goes against the West's hegemonic truths of science and common sense, it is worrying that universal ethics may follow mainly legal views and fall into bureaucracy thus creating dysfunctions when applying this to social-scientific and biomedical dilemmas. Taken to an extreme, the formulaic Western style, although in unintended ways, may hide unspecified interests in advanced research and pharmaceutical industry. No wonder that formal bioethics, seen as a discourse embedded in relations of power, as Everett (2006) suggest, adds to distrust new challenges for anthropologists to engage bioethics and find a place in committees and debates on reproductive technologies, health care policy and biomedicine.

However, the complexity and scale of bio-nanosciences and the biologization of politics and private life calls for an approach in both ways. Thus, Bioethics requires to be used attributively in the direction of multicultural interests by including and identifying problems which are relative to diversity and

globalization, and Anthropology unfreezes the scepticism when it intervenes in problems where Bioethics contributes with useful guidelines and arguments to serve ethical duties for the public, whether these be threatened lifestyles and/or suffering stemming from illness, poverty or environmental risks.

Bioethics was established to resolve moral dilemmas derived from experiments on humans and animals by appealing to dignity, freedom and protection. Now, in the interest of scientific and technological breakthroughs, such as the Human Genome and nanobiotechnology projects, and after being introduced into more private areas of body and self, with no recognized limits, problem identification and their subsequent principles of caution has began to refine the abstract principles of dignity and freedom towards specific terms such as privacy, consent, confidentiality and biocitizenship. This opens up new ways of understanding health, personal vulnerability and physical integrity in intercultural terms and, in addition, the risky side consequences of these advances modifies the configuration of ethical responsibility from intentional actions of individuals to unintentional collective, expert and systemic ones.

From this cross-cut systems of responsibility stems the clear thought in the recent Declaration on Bioethics and Human Rights (2005) which recognises cultural diversity as a source of exchange, innovation and creativity. On one side that health does not depend solely on the progress made in scientific and technological research, but on psycho-social and cultural factors and, on the other, that unethical scientific and technological conduct has brought about special repercussions in Indigenous and local communities. This greater sensitivity to non discrimination and non stigmatization of cultural diversity and pluralism is applied to biomedicine and other socio-surgical activities, such as donations and transplants and also the illegal trafficking of organs, tissue, samples, resources and materials related to genetics which affect countries with unlimited poverty and limited hospital services.

Despite Anthropology's traditional distant attitude towards codes of ethics in their most Utopian standard dimension, this new Universal Declaration reconciles differences since it highlights the junction of ethical and moral systems, encourages acceptance of cultural differences while instructing the avoidance of imposing inappropriate practices and experiments since nothing can be invoked and done at the expense of human rights and fundamental freedom.

Nevertheless, it is clearly the globalization of problems which compels an innovative conciliation between Bioethics and Anthropology allowing all intellectual and humanitarian resources to be used to benefit the common good of humanity, i.e., a global bioethics. Now, what cultural requirements will global bioethics create? How can we work together and promote viable alternatives?

Global Bioethics

Global bioethics is ethics in action, situated, dialogical and prospective. It cannot work with predefined and bureaucratic categories away from historical and particular social discourses and relationships. Neither can Global Bioethics be dealt with the use and abuse of dualisms and dichotomies that fill up metaphors and values, from which follow oppositions and contradictions. Among others, this means to overcome the opposition between what is universal and specific, to use instead principles and situations as a means of dealing with increasingly complex contexts in which human rights, since this will involve international groups, include many types of moral and political projects. Nor does globalisation admits any more the distinction between global-local, but compels to mutual impregnation or *glocality*. Thus cultures make up open systems of high connectivity between persons, goods and services in which not only is the economy interdependent, but also one's quality of life, health and scientific research. This worldwide system of culture which is increasingly more uniform and based on specialization and interdependence brings about conditions and actions which affect some, also affect others albeit in different degrees and time frames. Currently illnesses place everyone at the same level of risk so this raises many questions: Could it be that regrettably the fear of the link between AIDS and immigration raises alarm and lead people and government to take preventive measures as avoidance or restrict borders? Or rather, risks, on a global scale, may compel changes of mentality and think of health as bio-socio-medical networking?

The first lesson of global bioethics is to learn that what really places us all at risk is inequality. This means that defending one's own health cannot exist without sustainable interaction and development with other ecological and cultural systems, nor can illnesses be limited within borders which cannot be conceived on a local health level, but rather in the framework of world poverty and marginalization.

Global bioethics overcomes dichotomies introducing at the same time ambivalence and uncertainty as working criteria thus allowing the idea that where is light and objects, there are also shades. As it is notorious in discourses, articles and exhibits, on one side are set the benefits and on the other risks, as premises for standpoints, arguments and motivations. To mention a few: control versus accidental results, promises versus anxieties, increase good living conditions versus bringing up incontrollable mechanisms, support versus loss of confidence, poverty eradication and health improvement versus irregular distribution of means and autonomy versus power dependence. Even scientists seem to be trapped between two models of rationality: one search for emergent phenomena and complexity and the other for simplicity, precision and basic control. No doubt that these oppositions and contradictions are classical basics for epistemological critique and also part and parcel of value construction. But

facing complex problems, dualism instigates a restrictive way of identifying problems and responsible self-positioning. Even after a lively debate, this splitting pattern makes people to stick to their ideas and positions, finally leading to irreconcilable outcomes, and somehow blocking dialogue with fatalism and conspiracy. How we might foster a move away from these dichotomous patterns towards a more interactionist and developmental approach? It would be advisable to introduce a more transitive and symmetric epistemology to avoid intellectual closures that rule out uncertainties from beliefs, convictions and opinions, and in so doing diminish the complexity of biosocial processes, power relationships and collective ethical responsibility. Putting together scientific and cultural processes requires to overcome dichotomies such as risk vs. safety to recognize instead the symmetry of substance and accident. To invent a car, a nanorobot equipment, or nanobioimplants is at the same time to invent collisions and to acquire particular risks and side consequences. If each new scientific and technical advance brings with it the accident as a possibility, concealment either in form of avoidance or precautionary rules does not produce automatically safety. Safe and responsible manners require to engage in conceptual and value innovation for substantiating arguments according to complex technological advances such as Nanosciences and Nanotechnology. At nanometric scale, distinction between science and technology are broken and bring together different fields and environments embracing physics, electronics, optics, electrochemistry, science of materials, robotics, medicine, and other, introducing new devices and systems as well as properties, functions and manipulations, so the risky side is not on specific products but on scale and penetration, f.e., nanotoxicity, and also on privacy limitation due to nanochips and camera surveillance. Issues with no frontier which remain ambivalent respect to comparative health enhancement and international social security and that by all means need cultural ethics innovation for the development of new global responsibilities.

Situated Bioethics

The relationship between bioethics and culture is not focused on presenting theoretical or standard issues, but it is useful to understand it as empiria in specific and different contexts: in biomedicine applications when transmitting information and in public debates when involving the experts, media and laypeople in advanced research projects. That is why it is furthermore advisable to base research, arguments and debates on the diversity of situations and contexts as a basis to discuss differences of criteria, encourage the flow of informed opinions and proposals and achieve negotiated and concerted agreements between techno-scientific, cultural and moral communities.

Thus, the general theories on ethics are not starting points which allow to jump from theory to action, but the previous step for establishing identifiable empirical bases to revalidate and outline nuances or reform ideas and standards

in the respective ethical and legal frameworks. Therefore, being key principles, regulations and security agreements, these prove to be insufficient, or do not lead anywhere unless the cultural discourse, which is implicit in idealising biotechnology as something good for society, is not observed and clarified as well as identifying the ideological contexts and interests of science and industrial policies.

In this context, it must bear in mind furthermore which persons and in which institutions the problems are defined and therefore to include those affected by or suffering the problem, the called owners in research action. If it were not so, it would be difficult to give full credit to representatives or its involvement and collaboration, whereby there could be more collateral effects than regulating strategies to develop alternatives to the problems. Hence its importance to establish the parameters of acceptability and redistribution of risks in culturally plural scenarios and, above all, to give some sense to the cooperation which can help to endure what could be otherwise unbearable: the combination of illness and poverty.

In the field of global health it is advisable to insist, even due to economic reasons, on the relevance of traditional medicine. Ethnomedicine not only contributes knowledge to other therapeutic systems by means of ethnobotanical and herbal medicine, but also to the psychological effectiveness of ritual practices, the effect of placebo, which provide assurance to the patient for physical and psychological wellbeing. Nor should we rule out the dynamic nature of traditional practices since, in situations of contact and acculturation, both sorts of medicine are adopted as being useful and prestigious, being needed in that case studies on therapeutic synchronization.

For situated bioethics, ethnography supplies a provision of knowledge placed in the context of social practices facing situations of environmental and health risk. This ethnographic provision is useful to identify problems, to verify comparing ways of promoting equal or unequal access to medical, scientific and technological breakthroughs, to design corrective measures as regard to strategies and rhetorics of wellbeing and quality of life and to facilitate the transfer of this knowledge to other cultures.

Dialogical Bioethics

In society, bioethics should occupy the space of collective thought and dialogue between scientific breakthroughs and cultural ideas.

This means that communities of interdisciplinary co-participation are needed to discuss differences of criteria, encourage the flow of opinions and proposals and achieve negotiated decisions on ways of understanding illness and assessing

health, applications of biotechnology and biomedical practices, embryonic stem cells research, development and patenting, among others.

It is long since research institutions have understood the relevance of research ethics for scientists to reflect on technological design, development and patenting, and to understand the social and ethical dimensions of their work and results as well as consequences for humans. On the first point, ethnographic research on laboratories has pinpoint the importance of co-learning among the expert systems: science, ethics and humanities, so that Bioethics does not come at the end of the research project as Damocles' sword but from the very beginning. Co-learning thus becomes a interdisciplinary knowledge provision to assist dialogue between experts and the public.

Nowadays, public participation in science is promoted as an open door to participatory democracy and a good provision for the kind of knowledge biocitizens need at present. It is stimulated from scientific and research quarters as well as government's policies through recommendations and framework projects. No doubt that Science understanding and literacy are good things in themselves because the chance that citizens will be more effective decision takers increases and probably more wisely. But from a bioethical point of view this raises some premises of doubt, or at least some questions, on why and for whom is relevant to take into account or introduce understanding and public dialogue into scientific matters. For example, who may benefit from the promotion of greater public understanding? Is dialogue a way to give comfort to experts which are highly dependent from public funding and private initiatives and industry? In knowledge society, science has become a commodity, anything with its label is value added. It seems also that knowledge and its developed products are worthwhile to the extent that can be used not only to solve problems but to create a market. Successful marketing and selling comes to depend on familiarity with the products so public concerns needs to be taken seriously if these products are ever to become accepted. So public understanding is crucial for science's funding as well as biotechnological market economies need to activate public dialogue and advertising to sustain consumer demand.

To what extent knowledge got through dialogue facilitates to have a voice in scientific decision-making and when and where lay people can have a direct voice in scientific matters? Scientific knowledge is important to appreciate and to take effective decisions about choices and irrelevant scientific claims. Understanding and dialogue cannot be thought as greater public control of science, but to give some outlooks over who will participate in establishing controls, how controls will be organized, and how much they will influence detailed decisions concerning the nature and procedures of research.

Is invitation to dialogue a way to give confidence to general society that asks for transparency and responsibility? No doubt that strategic dialogue worries because it is not quite clear whether is going to conform approval or manipulate consent. However, a dialogical relationship between expert and lay discourses is needed to produce a conversation not privileging one dimensional goal and allowing for different public viewpoints, so that public concerns may be acknowledge by politicians and translate them into political measures. At this point is significant to quote Barbara Culliton's sentence that goes back to 1979 (Clarke, 1985): *"Public participation is not dangerous for the scientific enterprise. It is time-consuming and it is likely to lead to restraints that previously were not imposed. Nevertheless the restraints that come from ethical considerations cannot be dismissed as inappropriate. In any case, they are part of the social cost of democracy."*

Prospective Bioethics

And lastly it is advisable to regard bioethics in prospective key such as cultural design to specify aims and develop comparative methods to safeguard and promote the interests of present and future generations. Prospective bioethics cares about design anticipation and preventive intervention oriented to sustain and enhance human and environmental nature avoiding thus pollution, degradation and genetic, surgical and chemical manipulations.

Moratoria can be a partial answer but what is needed is to imagine and design a strategic framework to encourage parity between scientific, moral and cultural progress. Comets (CNRS, 2006) and some other institutional documents, propose simulation and fiction as methodological resources to explore possible futures. So it is recommended to give credit to fiction and use its scenarios for comparative assessments of bio and nanotechnology. Certainly, the aura of fiction is so great that is being credited with several functions: epistemological, heuristic and social to clarify principles and regulations and to reorient collective consciousness. No doubt that fiction and scientific data blending brings up wonderful futuristic scenarios and raises much enjoyment among students and lay public, not to mention media adds and programs. However, futurism at discussion level it finally leads to intellectual discomfort, a concern for inconsistencies that it has been raised by prospective analysts on the use of utopia and unrealistic indicators for cultural design making. The link between value making and futuristic workings is the sort of aesthetic discourse that fits well into imagination, but it does not go further into ethical practices to provoke public interest and to bear out political relevance.

Consequently, scenarios are a good methodology to foster discussion and awareness and as a point of departure, but at the same time lacking contextualization, values are incorporated into biomedicine and nanotechnological scenarios as remote moral ideas that prevail at any time and at

any reason. This produces misunderstanding based upon differences of orientation, of outlook and aim so there is no way to achieve an argumental form among the participants. And the end result is more often superficial consensus or position confrontation prevailing previous opinions, convictions, preferences and beliefs.

So I would bet for working on futuristic scenarios as point of departure, but what is needed is that these scenarios may finally help to focus the present, precisely where problems lie, values are situated and conversation can be done with partners, be experts, politicians and lay people on real topics and situations. To find ways to negotiate actions and pact goals, the most adequate methodology is action research, which is very cautious about superficial consensus and looks instead for co-generative problem definition and co-learning for strategic goals building between professional researchers and those affected by the problem arising from tecnoscientific applications (Greenwood and Morten, 1998).

Thus, instead of working with conjectures, it will be more motivating to design alternative models on funding assignment and research priorities, proliferation of biomedical options and choices, unequal benefit distribution and perfectibility and human enhancement. If socio-technological conditions already considered problematic and risky, can be given ethical meaning and cultural alternatives, any technoscientific advance in the future will have better prospects.

Making Ethnography from Bioethics

My activity as an applied anthropologist has been carried out in multidisciplinary research teams, specifically in the Observatory of Bioethics and Law in the Science Park of Barcelona University and as a member of the Committee of Bioethics at Barcelona University. Both of these are interdisciplinary systems of experts where one may solve and follow up problems related to risks of a personal, environmental and biotechnological nature derived from research and experimentation. From the outset, the aim of committees has been to avoid inhumane results in research and experiments, i.e., protecting those subjected to experiments whether human or animal - patients, control groups, or samples and biological agents and GM organisms.

In recent years, committees and commissions have become more popular both nationally and internationally, in hospitals, universities, and even in insurance companies as reference points for scientific credibility and guarantees for public acceptance. This rise has not been caused just because of the concern for risks from biotechnology, but because of acknowledgement of the political and industrial nature of this research, and above all due to the social and economic impact of the human genome project and the development taking place in nanotechnology.

Made up of experts in science, ethics and law to warrant research work and experimental projects, however the proliferation of committees and the use of protocols, sometimes exclusively, has open the way to bureaucratization, and with this abound in the negative view of biotechnology. Hence there is an interest to create other systems of observation within institutional Bioethics to follow up research and to find better ways to transfer scientific understanding to society, from local to global scale.

The Observatory of Bioethics constitute an interdisciplinary research centre focused on ethical problems and events that occur in the world of biotechnology and biomedicine and that are projected socially and publicly. The activity of academics and experts is to reflect on bioethics, on legal, ethical and social problems, to discuss problems by becoming involved in analysis of specific cases, and also to give ethical assessment and advisory services, by interdisciplinary teams which are members: physicians, geneticists, jurists, philosophers, psychologists, anthropologists, educators and nurses. Forming work groups depends on the problems to be debated or what is to be informed.

Topic selection is based on public demand and risk perception due to the repercussion of research in the media, which is also mediated by the impact in scientific and professional publications. Occasionally, the need for sensationalism and entertainment makes the media, whether this is the press, television or internet, appeal to anachronistic concepts and to the imaginative power of metaphors referring to prohibitions, such as *tabu in vitro,* and also to put the accent on cloning and the use of embryos for industrial use. Whether in the form of myth or science fiction the different forms of the eternal concerns of humans are updated: immortality, transforming the body to achieve eternal youth, and the nightmares of a future made from cryogenics and cloning. Sensationalism and fallacy engender risks shades, which leads the public to perceive risks they do not face, and to run risks they do not perceive.

In the field of public perception, problems seem to be beyond the experts and politicians as reasons for decisions are nor clear neither are solutions. Therefore it is not enough to impose more regulating principles and agreements on security, but it is very much needed to observe and clarify the cultural discourse implicit in idealising biotechnology as something good for society, the presence of ideological contexts of science and industrial policies and the distribution of benefits and risks.

Thus the interest of Observatories is to think research and application as a cooperative undertaking with both scientific and social aims, particularly to overcome the partial and fragmented construction of problems, to promote interdisciplinary conversations between experts and facilitate knowledge understanding and participation in public debates.

Collaboratories

The Observatory of Bioethics and Law is made up of an interdisciplinary team who investigate and draft reports and documents concerning the implication of ethics, law and society on biotechnology and biomedicine with the aim of offering guidance and increase debate among the public and specialists. The services provided for guidance concerning problems in bioethics, whether these are environmental or biomedical ones, are offered to bioethics committees, academia and also to private and public agencies, industries, laboratories and hospitals.

Also, with the aim of creating conditions for diffusing and circulating information, meetings and connections are encouraged between people interested in Bioethics, students, journalists, representatives of institutions and the public in general, through a Master in Bioethics, and also the association of Bioethics and Law whose meetings are organised around conferences, seminars and round tables on selected issues such as, sex selection, organ transplants and donation, blood transfusions and Jehovah's Witnesses, environmental risks, GM products, euthanasia, research on embryonic cell stems, forensic genetic tests and others.

The Observatory's production with the greatest diffusion are the Documents, publications regarding theme units as the ones mention above, which are presented in public, sometimes at a conference or a round table, and are widely distributed among institutions and media. Despite the interest for public understanding and projection, in this preliminary stage of conversation on bioethics the connection between experts and social agents is not solved and the artificial relationship between technological objects and biotechnological subjects is not clearly faced.

To represent the interest of society, lay members should be involved not only in public debates, but invited into selected seminars and finally be included in ethics committees , either as community representatives or interest groups such as subjects of experimentation. And thus bioethics committees would fulfil their own development from protection to consultation. However, the process is complex and requires the steps and connections to be systemised to create the ways towards conversation and collaboration. Thus, as regards composition, representation, training and functions of participants and their role as persons or groups with a capacity to decide, there should not be a random choice such as one for a public jury, since these are not individual opinions, but representatives. So it is necessary to establish minimum criteria regarding the origin of participating community organizations and interest groups, whether these are consumer groups, opinion groups, university departments, health institutions, and others. It would also be necessary to bear in mind their capacity to create public opinion, the occasional presence of more spontaneous organizations such as anti establishment movements who create opinion platforms against genetic

manipulations, web pages and an endless source of bulletins fighting against GM products.

Representatives must know who they represent and that there is not just one single voice, so there may be several competing groups with different opinions. They must have certain qualifications regarding training, reasoning, specific arguments, identifying values which are in dispute, a capacity for making decisions and defining problems. This requires preparation and training to activate understanding and create conditions to convey the information; establish collaborative relationships between teams of experts and public representatives or local representative groups; compare and confront interests, opinions and information from the media, and, lastly, learning substantive themes to define problems and, if possible, to achieve a feedback in processes following implementation. What is really relevant then is to learn how to frame or present the problem: ranging from who, how and where this is formulated, whether this is by theoretical induction, personal observation, opinion groups, public or private institutions or groups. Briefly, the expense of training and participation of representatives from the public sector should be part of research project's funding since they are the first and final contributors.

Bioethics and Anthropology relationship does not focus on principles and standards, images of humanity abstracted from its historicity and specific social relations, but on a framework where to interpret the proliferation of biomedical options and rhetorical choices that raises questions about values and the limits of human design deeply involved in particular discourses, instrumentalities and resources. And, as a consequence, to focus ethnographic and ethical action research onto the vulnerability coming from and the acceptability headed for nature remaking, body enhancement, implants, extension of life, unequal global health distribution, biocitizenship and biopolitics among others.

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Races: between Biology and Sociology

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Abstract.
As anthropologists, we have the ethical responsibility of actively let know human "races" are not a biological concept.

Contrary to what our common sense says about the existence of some great human races, based on traits perceived as essential (i.e. skin colour), this notion has no biological validity and the observed differences of traits are negligible compared to biological differences between individuals of a same population. The human species forms a single *continuum* or *clines*, following geographical gradients, in function of ecological barriers or gene flow and where the only real barriers are of cultural nature (linguistic, behavioural, ...). Today, the notion of human race has lost all scientific basis and is politically unacceptable. We do not have to imagine, however, that knowing that if race is a myth it will automatically eliminate racism.

The exact position to racism is not to deny the differences between populations, which do exist, nor to deny the need of Man to identify himself to a group, which is an undeniable need, but to assure that the diverse groups of people have the same access to resources, that no group as such, nor any individual, be discriminated.

Keywords*: race, racism, clines*

Introduction

Anthropology focused, very often in the past, on the study of differences between human groups and neglected the analysis of the variability present in each population (Susanne, 2003). It consisted in a typological approach which tends automatically to accentuate the variability between populations, minimising at the same time the intra-population variability. This attitude is very ancient. Since 1350 before our era, the Egyptians attributed to populations clear physical differences in the form of 4 colours: red for the Egyptians, yellow for the Eastern populations, white for the Nordic populations and black for the South-African populations.

Since a very long time, the descriptions of foreign populations are regularly filled with profound prejudices. This attitude ("autrisme") brings with it that "the other" is systematically considered as being imperfect, included (and foremost) in psychological and sociological terms, what permits, in fact, to justify the existing discriminations.

There was always confusion between culture and biology; one supposed that cultures technically simple are composed of less intelligent people. Only at the end of the 19th century becomes the analysis of cultures less ethnocentric. In 1896, Franz Boas supports that cultural variations might be explained through ecological and historical conditions. William Graham Sumner (1906) recommends study cultures for what they are but without any judgement of value without approbation, nor condemnation. We pass to the concept of cultural relativism.

A naturalistic debate

Human beings result, as all other species, of evolution: this is an aspect accepted by the scientific community, even if the different religions have for a long time defended the idea of a creation and thus of the absence of human fossils, and even if some creationist movements, such as the Intelligent Design, still want to promote faith in this domain (Susanne, 2005). The scientific observations are, however , clear through discoveries of a fossil human branch about 7 millions of years old, as well as analysis in terms of comparative anatomy, of embryological development, and nowadays in terms of biochemical and DNA data.

The mechanisms of this evolution are general for all living species, and not specific to the human species. The evolutionary history inside the human branch, including in the “racial” variability, is the fruit of factors such as natural selection, migration, genetic drift. The actual human variability can be considered as the result of this biological evolution, and of a differential adaptation to distinct environmental situations. The evolutionary forces have modelled the human species, and the human variability can be considered as a

naturalistic concept. At the same time, it has a geographical component by the fact variability will be linked to geographical isolation of populations in diverse environments .

Variability, also for the human species, is present at different levels

- for a part, this variability is existing between populations (inter-population)
- but for another part is also existing inside a population (intra-population variability).

Contrarily to what a general public could believe, it has been observed that for biochemical polymorphisms, such as blood groups, enzymatic polymorphisms and other genetic polymorphisms, the high majority of the total human variation lies inside the same local populations (intra-population).

Variability of human beings means indeed not only immediately "visible" characters, such as skin colour, morphology and dimensions, but also physiological traits, even in differential answers to diseases, and in biochemical characters (chemical constitutions of molecules such as proteins and DNA). Some of these traits are only genetically determined, such as the blood groups, others are characterised by an interaction between the genotype and the environment, such as stature, body composition and even the skin colour.

At the other side, the populations are different only in terms of frequencies of genes (quantitative differences) but not in qualitative terms (there are no genes typical of only one population or even one “race”). Moreover, human populations are never totally isolated at reproductive level. “Pure” races are a non-sense by the fact that human populations are characterised by mixing. Contrarily to the subjective methodology of the raciology, mixing between individuals of different populations is a constant of the human history.

Another typical characteristic of the human species is its polymorphism, resulting from the interfecundity of all human beings from the artic zone to the equatorial one. The migrations and mixing maintain and increase this richness at biological level, but also of course at cultural level.

Visible differences existing and we are used to consider that individuals appear more similar when they live nearby than when they live more far away. Also, neighbour populations seem more alike. These similarities are expressed at phenotypic level as well as at genetic level.

At genetic level, we can give as an example the sickle cell anaemia for instance, common in Central Africa and in India, but very rare in other countries. About the allele LAC*P, which allows adults to digest lactose, this allele is frequent in North Africa and in Europe, but less frequent in other countries. In general, also

for frequencies of blood groups, for instance, the genetic resemblance is highly associated with geographical proximity, *clines* are existing.

It is also the case for morphological resemblances: for instance, the skin colour is darker in equatorial countries and the robustness is higher in populations of high latitudes.

It means that we have the impression that we can group individuals in geographical categories based on genetic and morphological resemblances. The problem is that these classifications are each time different when the chosen trait is different: the one based on sickle cell anaemia is different of the one for lactose digestion, or for skin colour, etc. Moreover, as we saw already, this variation between populations is not informative because the differences between populations are much lower than variations observed inside one unique population.

In other words, classifications are totally arbitrary and do not represent natural subdivisions of the human species. Moreover, anatomically modern human beings are a rather recent species, the mitochondrial DNA and fossil evidences suggest an age of around 200.000 years. It means that the effects of natural selection and of genetic drift have had less time to produce large genetic differences inside the human species than in other older species. Moreover, we know that genetic drift tends to eliminate genetic differences between groups and that the dimensions of the human groups being reduced during their history many possibilities of genetic drift have existed.

“Races”

“Race can be defined as "each natural group inside a species from which the individuals present a determined combination of genetic characteristics". However, the application of this concept to the human species was never unanimously accepted, and many anthropologists are opposed to its utilisation. For many, the notion of race used by a general public or the notion of "large race" (based on the skin colour for instance) does not have an important biological meaning and does not suppose in any way clear subdivisions of the human species, contrary to what some can imagine” (Rebato, 2007).

“Some authors consider the races as *"semi-natural populations having some genetic traits in common, from which the immediately visible ones are the most important"* (Riquet, 1986). The term semi-natural refers to the nature of human beings itself, partly biological and partly cultural or social. Concerning the immediately visible traits, essentially the morphological ones (pigmentation of the skin, shape of the skull, hair structure, etc.), they are however submitted to environmental influences and express not more than a little part of the genetic

programme. It results in a great difficulty to divide human beings using biological traits" (Rebato, 2007).

In the typological and racial classification, the hypothesis is to say that races in their pure state have existed in the past, before migration caused a large mixture. In this reasoning, one forgets that migrations have always existed and thus gene flow as well. To say it with a play on words *"when groups meet they may or may not bleed, but they always breed"*.

In front of the continuous distribution (in *clines*) of morphological or biochemical traits studied, which renders each "racial" demarcation arbitrary, anthropologists to-day prefer to reject this typological concept which, moreover, has diverse methodological inconveniencies. It sterilises, in fact, the study of the origin of human variability and its comprehension; it also occults the study of the dynamics of populations and their interaction with the environment.

Populations can be characterised, not through physical traits but also through genetic frequencies: again it offers contradictory results and the maps of the different gene distributions in the populations all over the world do not superpose. As mentioned by Templeton (1999) on the basis of the DNA analysis in many human populations, *"human beings are one of the genetically most uniform species that we know, a large quantity of variation exists inside humanity but basically at individual level. The inter-population variation is much less important"*.

It was only after the II World War that human diversity was considered as the result of the micro-evolutionary process whereby gene pools of populations were differentiated under the effect of natural selection and genetic drift. The pretended "unmoveable" races became fleeting clusters of alleles. These populations were in constant mingling, adapting to local conditions, joining or separating. With molecular biology in the 1960s, phenotypes are abandoned in favour of genetic data. In 1950, a *Cold Spring Harbour symposium* of quantitative biology, named *Origin and Evolution of Man*, concluded that racial classifications had no longer scientific meaning and that researchers should rather be interested in the evolutionary process and the genesis of diversity within human species. It is in the same spirit that several declarations of UNESCO should be filed: the *Declaration on the race* of 1950, *Race and racial differences* of 1951, *Propositions on biological aspects and the racial question* of 1964 and the *Declaration on race and racial prejudices* of 1967. These texts partially answer to anthropological preoccupations but are also political and/or ethical answers trying to avoid that biological data would be wrongly used to benefit different forms of racism.

The scientific community changed in approach and mentality. Also in political terms, equality of rights becoming a social reality, raciology becomes irrelevant.

The study of differences between human groups will as of then no longer be qualifying but will retrace the origin of differences and try to understand the processes that it governs. The problem is that the limitations between such studies and studies of racial type have (and still are) often been blurred. If the biological study on human variation is relevant, problems of social and moral kind are often linked to it. Men have equal social and cultural rights, it is thus racist to classify individuals on the basis of traits of a group; it is immoral to pronounce judgements of values by mixing physical, mental, social and moral differences (Deligne et al., 2001, Susanne et al., 2003a).

In current language, the term "race" is still used to design sociological groups in a complex society, without corresponding to a biological signification whatsoever. The Hindus are considered as "white" in the USA but as "coloured" in the UK (as well as the Chinese, Pakistani and Malaysians). In Southern Africa of the apartheid, they formed a separate race (whereas the "coloured" race was represented by people of mixed origin). The first generation mulatto of a parent of African origin and a parent of European origin, who received the same genetic information from his father as from his mother and who has thus an ancestral origin of as well African as European, is considered in practically all societies as belonging to the black population. In South America, "mestizo groups" are often better defined with an enormous wealth of terms to name all the variances[1]. Thus, the biological reality does not cover the sociological situation. Certain American States have even defined the black race as formed by individuals having up to $1/8^{th}$ of black ancestral origin[2]. According to the laws of Nuremberg of 1935, a far Jewish origin was also enough to be considered as Jewish.

All scientists failed to create a consistent identification of races. Anthropologists agree that race, as a biological variability of humans, does not exist. No group of humans has ever been isolated for long enough to make populations very different from others. But, we continue to speak about white or black Americans, Arabs, Jewish, … stereotypes by mixing biological and cultural traits and so doing pushing certain economic and socio-political ideologies. We continue to confuse culture and civilisation on one side and genetic inheritance on the other, nation and population. It is forgetting that political oppositions are often the heritance of biological close populations, such as Irish and British, Hutus and Tutsis, Arabs and Israelis, Bosnians, Croats and

[1] In the New World, colonised by Spain, a hierarchical society was created, where each socio-economic group was defined by "race". More than 15 races were identified with at the top "pure blood" Spanish, these races included i.e. Indian, Barbarous Indian, Mulatto (a mixture of Spanish and African), Mustiza (Indian and Spanish), etc (Bernis, 2004).

[2] It is said that the Haitian dictator Duvalier told an American reporter that 96% of Haitians are white, explaining that Haiti is using the same procedure for counting whites as Americans use for counting blacks (Hirschfeld, 1996).

Serbs. It is forgetting i.e. that data relative to polymorphisms of blood groups, proteins or alleles HLA show that Jewish populations are genetically closer to non-Jewish populations of the same geographical localisation than to other Jewish populations geographically further.

Input of the genetics

If our understanding of past and present human variability has, in the last decades, radically changed, it is on the basis of the scientific progress in genetics, palaeontology, anthropology and ethology, but also (and maybe certainly) on the basis of changes in mentality and sociological modifications. As of then, the anthropologist studies the variability of populations and no longer the one of imaginary ideologies, keeping in mind that populations never stay isolated and that gene flows are constant, one observes *clines* of gradual variation. The only way to practice anthropology is to study Man as he is and not as one would like him to be (Susanne and Rebato, 2004).

The clear progresses done in the last decades in molecular techniques, such as the technology of recombinant DNA, the cloning of genes, the use of restriction enzymes or endonucleases, allow to analyse other polymorphisms such as the RFLP (polymorphism in the length of DNA fragments generated through the digestion by restriction enzymes) or the direct sequencing of nucleic acids (through the chain reaction of polymerase, PCR) and they allow to answer to the critics on the study of the previous polymorphisms. From the years 1980 on, it was possible to analyse directly the genotypes of the individuals, and to identify a very high level of variability (Rickards et al., 2003). Researchers have been eager to use the new molecular biology techniques to study ethnic or racial differences in health that are commonly assumed to have genetic causes. Some authors have demonstrated that this assumption is based on confusion between three very different concepts: genetics, race, and ethnicity (Pearce et al., 2004). The lack of major systematic genetic differences between ethnic groups, together with the extensive differences in lifestyle (diet, alcohol, smoking, etc.), means that ethnic differences in mortality and morbidity provide to some extent evidence against the importance of genetics factors and for the importance of environmental factors (Pearce et al., 2004, Rebato, 2007).

The study of fragments of the human genome has revealed that specific or particular genes to a population do not exist and, that a considerable genetic uniformity exists considering the large geographical dispersion of the human species (as it was previously noted, a part of the visible morphological differences are explained by the adaptation to a large range of biotopes). They have also demonstrated that the highest genetic distances are mostly observed between populations not between individuals: about 86% of all identified genetic variation is between any two individuals from the same ethnic group. Another 7% of all variation is between ethnic groups within a “race”- say, between

Spaniards, Irish, Italians and Britons- and only 7% of all human genetic variation lies on the average between major human races such as those of Africa, Asia, Europe, and Oceania (Lewontin, 1991). This limited genetic diversity of human beings indicates a rather recent and common origin of our species (Wilson et al., 1985), evaluated to happen 100.000-200.000 years ago. The evidences coming from the analysis of ADNmt (mitochondrial DNA) and from nuclear *loci*, including those linked to the X and Y chromosomes, confirm this recent origin as well as an African origin of Man" (Rebato, 2007).

The actual genetic variation reflects the history of migrations and of development of human populations from the African origin to the expansion of modern human beings. The genesis of human variability can be studied through genetic markers (Harpending and Rogers, 2000), but this variability does not imply a racial separation (Foster and Sharp, 2002).

We have already seen that the largest part of the genetic variation in the human species is present inside the populations, the human inter-population variability is also lower than in other species such as chimpanzees. This observation corresponds to our knowledge of the human evolution: it learns us that *Homo sapiens* being rather recent, about 200.000 years, that natural selection and genetic drift did not have time to result in large differences such as in older species, i.e. chimpanzees. Moreover, genetic flow between human groups is an important fact of the whole human history eliminating genetic differences between groups.

The analysis of the genome is one of the emblematic progress of sciences, allowing to decorticate life and somewhere to demystify life. To know the sequence of human DNA is a determining factor to understand human life and human evolution. The consequence of these studies will be the analysis of the genetic similitude between human beings and between different species. This allows already to say that human being and chimpanzee have a genetic similitude of more than 99%, human being and mouse around 90% similitude.

However, these little differences between great apes will be very interesting to see what could be qualified as specifically human. Which genetic accidents have allowed the human history? It will also probably feed some philosophical debates.

One evidence of the genetic analysis is already that the genetic pool in Africa is much more variable than elsewhere: the variation outside Africa represents only a part of what can be observed in Africa. Somewhere, we can say that genetically speaking all human beings are African.

At ethical levels, the genomics in medicine and in biology is bringing a danger, indeed, it puts the accent on the human genome in the media, the genetic

successes and the medical genomics giving the idea of an almost total genetic determinism on diseases, and even on behaviour. If in the 1980s, geneticists had to defend the idea that the human development was also genetically influenced, to-day one has to insist that the environmental influence also exist in the development of diseases and of behaviour.

The techniques of the modern genetics allow to decipher progressively the human genome. Genetic mapping, in the sense of locating a gene on a chromosome, occurred as early as 1911 for the gene of colour blindness on the X-chromosome and 1968 for the gene Duffy on the chromosome 1. Since 1973, "Human Gene Mapping Workshops" occurred to actualise human genetic map: this information was well known in the scientific world and published in books first, at computer science level afterwards.

Mapping the whole human genome is an idea which proved already in the 70s: "mapping the human genome is a challenge to the human intellect". But, technological innovations allow soon sequencing DNA bases and DOE (Department of Energy, USA) will propose in 1987 the challenge to sequence the total human genome. Already in 1988, the NIH (National Institute of Health) will give official character to this programme under the name of "Human Genome Project" directed by J. Watson and in 1988 also a Cold Spring Harbour workshop creates HUGO (Human Genome Organisation), an international organisation coordinating research at this level. If the United States is participating largely to this project, the United Kingdom, Germany, France, Italy, Canada and Japan are participating also: genome centres are realising physical and genetic maps as well as sequencing. The budget is estimated to at least 2.5 billion Euros.

HUGO, by localising and sequencing genes of congenital diseases, is promising future considerable medical progress, both at diagnosis and therapeutic level. It will allow indeed diagnosis and gene therapy of monofactorial diseases (linked to only one gene). But, multifactorial diseases will be implied also such as cancer, for instance.

Genetic research will undoubtedly lead to important discoveries and new forms of treatment. However, such benefits are a long way off and require large investments with potential benefits for a few high risk individuals. This leaves little to promote the health of the majority. The emphasis on genetic explanations for population differences in health has also led to controversial instances of "gene hunting" by multinational institutions. The affected countries may have inadequate or non-existing legislation on ethical and social protection for human subjects of health research in general, or genetic research in particular.

The genetic analysis developed very rapidly. However, it is only recently that molecular biologists realised that a huge variability exists inside each human population. The human genome cannot correspond to one person, or some people, otherwise the molecular results could appear as racist, because it is typologist. HUGO decided in 1994 to create another programme HGDP (Human Genome Diversity Project) to understand this variability. For many anthropologists, HGDP is, however, associated to some ethical problems such as the choice of the populations and their representativeness.

The HGDP created even anxieties in some of the studied populations: studies of genetics of population would have to answer indeed, as all "experimental" studies on human beings, to criteria of free and enlightened consent. Individuals must be informed of the goals of the study they are participating in, they must be free to participate, they must have free access to the results, economical consequences must be defined in terms of marketing of the genetic data banks or of exploitation of some individual or collective ownerships (Susanne et al., 2003b).

However, the ultimate goal of the project to obtain a full sequencing and the interpretation in functional genes and in a genetic map progressed dramatically: many biochemical diseases are mapped, their genetic origin better understood, diagnosis of carriers better managed, pre-implantation diagnosis started, genic therapy also started. It also brings human genetics and population genetics in the public debate. Which tests to practice? In which conditions of confidentiality? How far to go in the genic therapy? Answers are surely possible, but they must no longer be given by scientists exclusively.

These studies lead also to imply studies of the variability of the human genome in reaction to vaccination, or also in positive and negative reaction to medication (a topic called pharmacogenomics). It could lead to personalise medication after a genomic analysis of a patient.

The genomics will lead also to give a larger role to the genomic therapy, the utilisation of cloned organs or of animal organs in xeno-transplantation.

Practically all the new realisations of the human genome analysis have ethical implications. How to use the genetic analysis of a person? Can this information influence his assess to an employment? Are the insurance companies authorised to use this information? Is the genome of a person only a private thing, or can it be sold? Must the results receive a guarantee of anonymity?

The case of Iceland is exemplary: on December 17, 1998, the Iceland Parliament "sold" in a sense the genome of Icelanders and gave its agreement to an American company, DeCode Genetics, for exploitation of their medical bank data, genealogical archives and DNA databank of Iceland's population. About

3.000 Vikings and some Irish slaves populated the island between 870 and 930, they remained totally isolated practically to the second world war, practically during 50 to 60 generations. Through this isolation, Icelanders are characterised by a rather limited gene pool, interesting from a genetic and medical point of view. To establish the whole databank would cost 130 to 244 million Euros. Are in favour of this project people thinking it could contribute to the study of congenital diseases. Opponents question the lack of democracy being at the basis of this decision, on the lack of free and informed consent of Icelanders and the lack of anonymity of data banks. The project implies also a private company receiving a monopoly over the whole genetic data and the financial profit.

A more or less similar project exists for the Mormon population of Utah headed by Myriads Genetics, who identified and patented for instance the gene BRCA1 responsible for breast and ovary cancer.

Private genetic research is more developed than the public one and 80% of American geneticians is working for private companies. This tendency has to be questioned because it influences the orientation of the research and it limits return of profits to public institutions or to the implied populations.

In the case of the HGPD project, some South American tribes are even speaking of "bio-piracy". Also in population studies, free and informed consent must be secured: aims and objectives of the surveys should be clearly explained. Of course, the results could not discriminate the participants to these studies. One would not also use the results for pseudo-classification of populations. Results would be communicated to the individuals.

Right of difference and exclusion

The ancient conception of "they are not like us" often becomes "they do not want to be like us". Very subtle, the new European right-wing politics has recuperated the concept of "right of difference" that democratic movements had used to defend the human rights of certain prosecuted populations. These right-wing political movements even transformed themselves into defenders of ethnic pluralism to justify discriminations and expulsions.

By pointing some immigrants as scapegoats, new forms of racism are insinuated in our societies and receive, by votes on extreme right-wing parties, a democratic support which, paradoxically, introduces the germs of denial of democracy. This situation is part of the phenomenon of frequent exclusion in our actual societies: racism gives “an ethnicity touch of” exclusion and social hierarchies. Compared to violent forms of racisms, this is a "*soft*" racism in development.

Racism, affirming ethnic inequality, often exists in daily life under the form of multiple exclusion, inferiority and marginalisation acts as well as "legitimate" attitudes through these supposed differences. These attitudes can be subtle and accompanied by denials such as "I am not racist, but ...". However, as long as racism is denied, an antiracial campaign is not considered necessary: racism is considered being present only in the extreme right-wing parties whereas, in other movements, it would be only a matter of discrimination or xenophobia.

In a variable degree, all societies are multiethnic and with their own history of relation /domination of some ethnic groups on others. In this sense, all along the human history they have formed two main sectors of population: those that move to geographical and culturally different places, as conquerors, colonizers or emigrants for economic reasons, and the indigenous, conquered groups that remain in the lands of their ancestors (Bernis, 2004). The indigenous groups gather about 300 million people at the present time, and they live as minorities in the lands of their ancestors conquered and colonised by populations of different ethnic and geographical origin. In 1920, representatives of these groups began a long fight for the recognition of their rights, their patrimony and their cultures. In 1977, they were recognised by the United Nations and other international organisms. The period between 1995 and 2004 was established as the international decade of the world indigenous populations, with the aim of "(…) the promotion and the protection of the rights of the indigenous populations and their capacity to choose the options that allow them to preserve their cultural identity, without stopping to participate in the political, economic and social life, with a full respect for their cultural values" (United Nations 1998). This growing migration escaping from the misery produce some nuclei of ethnic minorities coming from poor countries, with a quick demographic growth and, frequently, with colonial links with the countries of destination. These minorities, besides being physically and culturally "different", frequently claim their rights to maintain their differences and their ethnic identity, and this exacerbates the outbreaks of racism and xenophobia, more and more frequent in the current world (Bernis, 2004).

Let us be suspicious of all forms of philosophies of exclusion, nationalism and religious fanaticism which attract fear, aggressiveness and hate. For all fascist regimes, and more generally dictatorial regimes, feelings are more important than intelligence because these regimes ask adhesion without discussion and reflection to values and/or leaders. Rationality and critical thinking, which allow a spacing out to manipulator ideas, are in these circumstances natural enemies. We need to continue the eternal fight of reason. We might not be entirely free and equal, but let us have at least fraternity which should command politics and international economies.

Human beings often fear their freedom: it is a tool we can not bring under perfect control. We prefer often stereotypes and ideological totalitarian remedies

to calm our feelings of inferiority and our metaphysical anguishes. Man has to be aware of his “animality” to take "his own animal" in charge.

Today, human beings are not more considered as the centre of the world, the cosmos is becoming the centre, which has to be defended against human beings. The biosphere is receiving an intrinsic value, higher than the value of the species *Homo sapiens*. A crisis is created and the carrying capacity of the biosphere is forcing us to find a new relationship between Man and Nature. Human evolution is a history of symbiosis, control and later on domestication of Nature, it is also a history of violation of Nature exacerbated by the exponential development of technologies and of population densities.

In Anthropology, we consider too often Man as an island outside of Nature; we have perhaps the tendency to think of him as being above Nature because he developed original qualities and because he succeeded in the conquest of Nature. In fact, we have more to consider Anthropology in terms of ecology, to place Anthropology inside human ecology. Man is not opposed to the Nature, he is autonomous but dependent on it. We must give an ecological thinking to Anthropology (Susanne and Hens, 1998).

Conclusion

In anthropology, we need to objectively study human variability; from this point of view racial classification, proposing pseudo-solutions to non existing problems, is a loss of energy. Moreover, it is creating a mental predisposition which could be a door open to racism.

The knowledge on the genome is becoming more and more a basic element of the relationships between people and institutions, tribunals, illness insurance, ethnic identification, and so on. This situation, besides the updating, in the daily language, of the concepts of race, ethnos and other derived words, urgently requires a wide debate among the civil society, the academic world, the legislators and the social and political institutions (Lewontin, 2000). As anthropologists, we have the ethical responsibility of actively participating in this debate, to lead it, to let know human "races" are not a biological concept.

Contrary to what our common sense says about the existence of some great human races, based on traits perceived as essential (i.e. skin colour), this notion has no biological validity and the observed differences of traits are negligible compared to biological differences between individuals of a same population. To divide human populations in a certain number of groups gives rise to arbitrary divisions and not natural ones. Populations are in fact local groups, in continuous change, of bio-cultural unities. The human species forms a single *continuum* or *clines*, following geographical gradients, in function of ecological barriers or gene flow and where the only real barriers are of cultural nature

(linguistic, behavioural). Today, the notion of human race has lost all scientific basis and is politically unacceptable. We do not have to imagine, however, that knowing that if race is a myth it will automatically eliminate racism.

The myth of the inequality of races is a political vision that rests on doubtful scientific data. It is put back onto the agenda by an ideology of extreme right-wing and by ethnocentric nationalisms. The history of this alliance between extreme right-wing and manipulated scientific concepts is long and, sadly, rich, as we just saw. The hatred for the other and the egoism provide always performing engines to demagogues.

Biological anthropology, as social anthropology, has been misused at different periods and in different contexts to justify the colonial exploitation, to fortify a nationalistic ideology, to control indigenous populations and thus to support the exploitation of Man by Man. But, anthropology can also serve to facilitate an educative system in a multi-ethnic context or intercultural relations in a global economy market. It can thus promote justice, equality and human dignity.

It is important to mention that we certainly can recognise the differences between populations but that these are gradual and according to geographical gradients, that they do not imply judgements of values and that they are relatively less important than other differences observed within each of them. As a consequence, the notion of race has, today, lost its scientific value, even if it can conserve a signification of social identification. The exact position to racism is not to deny the differences between populations, which do exist, nor to deny the need of Man to identify himself to a group, which is an undeniable need, but to assure that the diverse groups of people have the same access to resources, that no group as such, nor any individual, be discriminated.

Each individual is, biologically speaking, unique, it is this genetic diversity which is the richness of the humanity. The anthropologist knows that the advantage of this variability is the plasticity it gives in front of environmental changes. In the same sense, at cultural level, monomorphism leads to stagnation. Therefore, from Anthropology, we must condemn each kind of eugenism, political or pedagogical leading to a decrease of the human variability in biological or cultural terms. “The recognition of biological and cultural diversity implies tolerance to the differences” (Susanne, 1986).

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PART II

POLICY MAKERS IN BIOETHICS

- **Cell Nuclear Transfer (CNT) & YOD Cloning: a Necessary Identification**

- **Pre-implantation Genetic Diagnosis (PGD). Technical and Ethical Questions**

- **Ethical problems Fighting Genetic Diseases: Informed Consent in Genetic Research and Biobanking**

- **The Co-modification of Biotechnological Advances: the Case of Private Umbilical Cord Blood Banks.**

- **Is There any Specific Lesson to be Drawn from the South-Korean Forgery?**

- **Genetic Biobanks: Ethical Challenges from Systems Biology.**

- **The Quest for Absolute Health: Biomedicine as a Janus Bifrons**

Cell Nnuclear Transfer (CNT) an Yod Cloning: a Necessary Identification?

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Abstract

Throughout the last years, the discussion on the ethical significance of cloning, both reproductive as well as therapeutic, has acquired a growing importance in our modern societies. In spite of that, it seems that we are still far from reaching a consensus on the legitimacy of these practices. The use of the term "cloning", so fully loaded of negative connotations, is one of the reasons that help to explain this difficulty. The aim of the present work is precisely to carefully analyse its use, with the hope of contributing to clarify some aspects on the ethical discussion over this phenomenon. In this way, we will try to demonstrate that a cloning rarely takes place with the transfer of embryonic nuclear cells. Or that the technique itself, applied on somatic cells, in fact, can give rise to beings that are genetically very different from the donor. At the same time, we will analyse the ethical consequences of this new orientation of the terminology.

Key words: *embryos, therapeutic cloning, stem cells, human beings, names.*

But… What is cloning?

The term "cloning" is derived from the Greek word "Klon" which means "cutting" or "sprout". Starting from this basic linguistic derivation, modern science has created a concept that, as applied to biology, wants to make reference to the *production of a genetic replica of a strain of DNA or of a whole organism.* Therefore, a clone will be a DNA fragment or a genetically identical being to an already existing one. Nonetheless, the concept of a clone is diffuse. Theoretically, only those beings that share 100% of their DNA can be considered clones.

In practice, however, we assume that some slight variations in the genetic make-up of two beings do not make them loose their condition as clones. For example as happens with twins, that as all living beings who vary their genes throughout their life, and in spite of this, we continue to consider them identical from a genetic point of view. In the same manner, the sheep named Dolly never shared the entire DNA from the cloned sheep to which it owed its name and that was the source of the mammary cell. Nonetheless, it was always considered a clone. Certainly with this, we have altered the concept of clone to a diffuse term, as diffuse as the concept of whether a person is bald or not, as Professor Lorenzo Peña would say. As will be seen throughout this work, this will be of great importance, as it will require us to debate, for example, whether a genetically modified organism through SCNT is or is not a clone. Nonetheless, for the moment we will limit ourselves to follow up on our study on what constitutes a clone through the exposition of the methods that can be used in order to create them.

The faces of cloning.

Clones can be created in four different manners. The first is through what is habitually called twinning. It is the only manner that occurs spontaneously. For reasons that are still unknown, three out of one thousand fertilisations give rise not to one but to several embryos. These embryos are the origin of the twins, which, as a result of its process, share the same DNA. The second way to clone, which truly imitates twinning, is through the artificial separation of the cells of an embryo, in a way that they become two or more different embryos. Nonetheless, these embryos share an identical DNA. Generally, this is called *splitting embryos.*

The third way to create a clone consists of applying a bioengineering technique called *cell nuclear transfer (CNT).* This method involves the transfer of a donor nucleus of a cell of a being into an enucleated oocyte, which will then be activated and will start to divide. If the nucleus of the cell comes from an embryo, then it is called *embryonic cell nuclear transfer (ECNT)*, while if the nucleus comes from an adult cell, then it is called *somatic cell nuclear transfer*

(SCNT). The difference with the two earlier cases is that in the case at hand, the duplication of DNA may not be perfect, given that unless the oocyte comes from the cloned being, the new being shall not have its mitochondrial DNA.

Nonetheless, there is another substantial difference between the first two types of cloning and the third that will result in an important singularity for the purposes of this text. Both in natural, as well as in artificial twinning, the creation of a clone is a necessary consequence of the process. In fact, if artificial twinning would not create two embryos, we wouldn't doubt to blame the result as a defective application of the technique. In the case of natural twinning, we would not even grant such a name to an event that would not end with the creation of two clones. Nonetheless, in the case of the transfer of nucleus of cells, the creation of a clone is but one possibility of the technique, but not its necessary result. We will try to demonstrate this statement in the following paragraphs.

ECNT and cloning.

Let us consider the transfer of embryonic nucleus cells. Furthermore, let us consider the case in which an embryo would suffer some type of defect in its mitochondrial DNA that could lead to grave pathologies in its development. The most adequate therapeutic solution in such a situation would be to extract the nucleus and to implant it in an oocyte that wouldn't have such a defect in its membrane (evidently, the oocyte should be from a different donor than the person who originated the embryo). Would we be speaking of a cloning in such a case? From my point of view, it is evident that this is not the case. The reason why I reach this conclusion is that, strictly speaking, it is almost impossible to think that the technique has created a human being different from that already existing. Therefore, without the creation of a being, it is impossible by definition to speak of cloning. If in turn, I reach this conclusion, it is because in reality the only thing that we will have done is to seize a non-essential part of an embryo and replace it with a healthy one. I don't see any difference between this type of act and the undertaking of a transplant in an adult person. Therefore, in conclusion, we can state that in spite of the application of CNT in this first case, there is no cloning whatsoever.

Let us imagine a second case, in which the pathology is not within the mitochondria of the embryo, but rather in the DNA content of its nucleus. If we would undertake the same technique without any type of variation, we would definitely obtain, a cloned embryo from the previous one (provided that the oocyte would be from the same donor). It is obvious that an act of such characteristics would not make much sense, so we will therefore not take it into account. However, let us imagine that those in charge of the project would decide to use CNT not to clone but to cure the embryonic pathology. In order to do so, the most advisable form to undertake the project would be to extract the

nucleus, in whole or in part, and to subject it to gene therapy and only after this to introduce it into the enucleated oocyte. In this second instance, whether this is cloning would also be debatable. On the one hand, the argument could be that the "new" embryo would possess a DNA that is modified from the original, and therefore should not be labelled as a clone. Nonetheless, the objection could be sustained alleging that such a small difference in the DNA with the first is not sufficient to consider that a clone has not been created (we will later look at this theme again). Nonetheless, even accepting this, a second objection would still remain. If we consider that the "new" embryo shares the same DNA with the first (an axiom that we must accept if we don't want to return to the first objection) Couldn't we also conclude in this case, that maybe the creation of a new being has never taken place, but rather, the only thing that we have done is to cure an already existing disease?

The answer to this new question is slightly more complex, as it will depend on one or two determining factors. If we think that the extracted nucleus is, in reality, the organic whole that conferred the unity to the original embryo and thereby the discarded part could hardly be labelled as an organism, then it would be difficult to think that a new being has been created (there was one and there continues to be one identical to it, therefore, why not conclude that it is the same?). In turn, if we believe that when a part of the nucleus is extracted and then inserted in the oocyte, then what has been done in reality is to create two embryos, one healthy (resulting from the application of the technique) and one with a disease (the group of embryonic cells that we have not transplanted), the objection that we have not cloned because we have not created a new being falls at first sight. The healthy embryo seems to be the cloned embryo of the original sick clone that still exists in that non-transplanted nucleus. By luck or despair, that forces us to admit that the sick and the healthy being are clones. This does not stop from being problematic; as does anyone truly believe that a being who suffers from a genetic disease and another who doesn't are identical in DNA terms?

The most obvious conclusion that can be drawn from all the aforementioned is, in my opinion, that it is a manifest error to identify ECNT with cloning. It is reckless to speak of cloning in those cases where the technique is used to modify the mitochondrial DNA. On the contrary, in those where the object is to change the nuclear DNA, it is easy to argue that there has never been a cloning, either because a new being is not created or because the being that is created (healthy) is sufficiently different from the original (sick) so that we do not consider it a clone. Of course, the possibility remains open for the use of the technique to produce identical embryos to those already existing, which of course, would indeed give rise to a cloning. In my opinion, this use of ECNT would be absurd, given that the splitting of embryos is a much easier technique that could give the same result without any problems.

SCNT and cloning

Let us analyse the second possibility of CNT that which uses the nucleus of the somatic cells. As is well known, this is the method used by Ian Willmut and his team to clone Dolly the sheep. The experiment in and of itself had such repercussion that, since then, the use of the technique has been directly linked to cloning. This is nonetheless, nothing strange, given that SCNT has been particularly efficient when trying to achieve the cloning of cells or of pluricellular beings. Nonetheless, I will now try to demonstrate that the cloning of a living being is not the necessary result of its application, but rather, only one of the many that can be provided.

In fact, and to begin, SCNT has the considerable disadvantage that, in case that you want to clone a male of any species, the mitochondrial DNA will necessarily be different from that of its parent (in the case of females, it will depend on whether the donor of the nucleus also provides the oocyte). As a consequence, there will always be a part of the DNA that is different between them. Nonetheless, we will be generous on this issue and we will consider that both beings could be considered, as a whole, clone and cloned.

Now well, it is rather more complex to reach the conclusion that SCNT produces one clone if the clone is very different from the cloned being. This is due to several reasons. First, in order to begin, let us imagine an experiment in which SCNT is used to clone an entire being, which is usually known as reproductive cloning. Let us also assume that our transplant of the nucleus is carried out without any type of problems; thereby the embryo obtained is introduced in the uterus of the female, in a way that it will develop until birth. Nonetheless, let us imagine that at some moment during the pregnancy, the bearer suffers some type of pathology that substantially changes the DNA of the unborn, thereby being born considerably different to the person being cloned. Would we consider that in this case there has been a cloning? I fear that our answer to this question would be positive if we believe that the months in which the clone was in the womb are sufficient to consider it a being. However, if we believe that only the animal that is *born* with the same gene characteristics to another already existing one is considered a clone, then the answer must be negative.

Anyways, I will allow myself to strengthen my argument with another example. Let us now think of a case in which we do not wish to create an identical being to another already existing, but rather, what we want is to take part of a person's DNA in order to later modify some of it, in a way that the being that is created has a pre-established pattern. In this second case, it is much more difficult to think that what we are doing is a form of cloning. This is in spite of the fact that in this case we are also using SCNT as the technique: using a somatic cell, removing the nucleus and inserting it into an oocyte. The only difference here is that in the middle of the process, we will have made some substantial genetic

modification. But that modification has made that the SCNT never generate a clone, in spite of being correctly applied.

Let us look at another type of cloning, therapeutic, which always works at a cellular level. Here the differences are easier to observe. Let us think of a process in which the extracted nucleuses of the cells are subjected to gene therapy, in a way that its DNA is satisfactory for the desired therapeutic purpose. In such a case, it is difficult to know whether what would be happening could be considered a cloning or not. Probably, all would depend on the degree of variation that we would subject the DNA to. It would also depend on how far we would want to stretch the idea of cloning itself as a diffuse phenomenon. Nonetheless, let us imagine that the DNA variation would be sufficiently important so as to make the haematopoietic cells be capable of behaving as neuron cells. This is a phenomenon that, on the other hand, is often desired by researchers when a line is incapable of regenerating. Would we state in such a case we have cloned cells? And if we say so, what will be the type of cloned cell line? Of haematopoietic cells or neuron cells? From my point of view, the fact itself that the answer to this question is debatable means that it is absurd to speak of cloning in this case.

The conclusion that can be reached to all that has been mentioned is that SCNT can certainly be used for cloning, either the cells (therapeutic cloning) or entire beings (reproductive cloning). But this does not mean that this is its inherent objective. The final objective of the SCNT is to transplant a nucleus from a somatic cell. There is nothing more and nothing less. This is so much so that solely taking into account the technique used we can never know whether the result of all the process will be the appearance of a clone (something which would indeed happen in the splitting of embryos). Rather, the final purpose by the researcher would be necessary in order to know this. I think to speak of cloning would be reckless, if in fact the biologist desires to use gene therapy and SCNT is only an adequate means.

Final thoughts

All the aforementioned in this text can be summarised as follows: CNT is a technique that is useful for cloning, be it reproductive or therapeutic. Nonetheless, one can't make a deduction that cloning is the only final purpose of CNT, as happens with embryo splitting. In fact, ECNT can hardly create a clone, while SCNT can be combined with genetic engineering practices to create genetically modified organisms that in my opinion should not be called clones.

In my opinion, a distinction as that which I have made is useful and even, maybe necessary in order to adequately face the ethical discussion of the philosophical facts. In the first place, this allows us to free ourselves from the excessive use of the word "cloning". A word that is full of prejudices. In the second place, it

allows us to face phenomena, such as ECNT, from a new perspective, maybe more suited to reality. In the third place, it allows us to create a new formula in the distinction between what constitutes a cloning and what should be included in the field of genetic engineering.

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Preimplantation Genetic Diagnosis (PGD). Technical and Ethical Questions.

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Abstract

Preimplantation Genetic Diagnosis (PGD) is a diagnostic technique associated with assisted reproduction, which was initially developed as an alternative to prenatal diagnosis to reduce the transmission of severe genetic diseases for fertile couples with a reproductive risk. It is currently also used for other clinical applications such as increasing the pregnancy rate in infertile couples and couples who have experienced failure in previous *in vitro* fertilization cycles. In recent years, PGD has begun to find new medical applications in areas such as analysis of susceptibility to multifactor pathologies, HLA matching for existing children and non-medical applications such as selection of sex arising from cultural matters, individual preferences and family balance. PGD involves *in vitro* fertilization (IVF) and a subsequent biopsy of one or two cells from the embryo at three days. On the basis of the cells biopsied, a genetic diagnosis is drawn up of each embryo so that only those embryos, which meet the required conditions, are then implanted. As with other technical interventions in the earliest stages of life, the application of this technology has sparked intense moral debate. This paper describes the technical basis of PGD and looks at the most ethically controversial aspects of the technique while intentionally avoiding any arguments related to religious belief.

Keywords: *Genetic Diagnosis, Genetic Analysis, Assisted Reproduction, Fertilization in Vitro, Embryo Selection*

Introduction

Although genetics did not appear as a science until 1900, interest in learning and controlling the transmission of inheritable characteristics can be seen as an inherent part of the modern history of humankind. Evidence of this interest and of the effectiveness of the control achieved can be found in the processes of domestication of animals and the commencement of agriculture between 10,000 and 15,000 years ago (depending on the area involved). Full development of livestock and arable farming is evidenced in archaeological remains and in depictions such as the paintings on ancient Egyptian tombs (figure 1) and bas-reliefs from ancient Assyria (figure 2). These prehistoric processes established the foundations for the development of modern day agriculture and livestock farming based fundamentally on the selection of male and female parents for both the breeding of animals of particular interest for livestock and the production of commercial varieties of plants.

Figure 1: Tomb of Nefer and Ka-Hay (2770-2200 BC) in Ancient Egypt. The harvesting of papyrus and the use of domesticated animals are shown.

Figure 2: An illustration showing a relief from the Assyrian kingdom of Assurnasirpal II which depicts the artificial pollination of date palms.

The experience acquired in selecting features in animals and plants was probably influential in the recognition of inheritable features in human beings. Several ancient civilisations provide us with evidence of the stress placed on the hereditary nature of traits concerned with physical and mental health in human beings and even with their role in society. For example in the time of Homer the gift of prophecy was considered to be hereditary. Among the Jews of the tribe of Levi the priesthood was hereditary. The Hindu caste system is based on the belief that the dignity of an individual is an inheritable feature. There are also numerous examples of religious texts that refer to the inheritable nature of certain illnesses: 5000 years ago the tablets of Babylon listed more than 60 birth defects. The sacred writings of Hinduism give instructions on how to choose a wife, stressing that she must have no inherited illnesses and that her family must provide proof of positive qualities maintained over several generations. The Jewish Talmud explains that haemophilia is inherited and gives instructions concerning whether or not circumcision must be carried out if there is anyone in

the family who has had problems of coagulation, taking into account the degree of kinship and the sex of the individuals in question.

In spite of the interest shown by human beings in historical and prehistoric times in seeking to understand and control processes of genetic transmission, it was not until the rediscovery of Mendel's work in 1900 that sufficient information became available concerning exactly how genes were transmitted and how statistical methods could be applied to estimate the likelihood of certain features appearing in the descendants of a specific couple.

Mendel's work explains that individuals have two alleles or versions of each inheritable characteristic. These alleles can be the same (in the case of homozygotes) or may contain information that is somewhat different (heterozygotes). In each gamete of an individual only one of the alleles for each characteristic appears, though both are equally likely to form part of the gamete. This means that a descendant produced by sexual reproduction receives one paternal allele for that characteristic (transmitted by the spermatozoid) and one maternal allele (transmitted by the fertilized oocyte).

Mendelian theory not only explains the mechanism of inheritance but also provides a simple biological basis explaining Darwin's theory of evolution (1859) as regards the transmission of adaptive hereditary variations. According to this theory, natural selection is responsible for ensuring that those individuals with the hereditary variations that enable them to adapt best to given environmental conditions will have more descendants than those who are less well adapted. But these variations, which favour survival and reproduction in certain individuals, can only be of evolutionary interest if they can be transmitted from one generation to the next, and it is here that Mendel's theory blends into Darwin's theory of evolution. It is the coming together of these two theories that provides the basis for modern day evolutionary biology and genetics.

Interest in studying the inheritable nature of certain human features arose at the very birth of genetics. In 1902, shortly after the rediscovery of Mendel's principles, alkaptonuria was described as the first case of an innate metabolic error that can be explained genetically.

The application of genetic knowledge to characteristics of the human species was not restricted solely to clinical matters and to diseases. In the early years of the 20th century the theory of natural selection began to be applied to numerous questions in human society. The application of Darwin's theory to humans led a group of scientists to propose eugenics as a selection procedure that would permit the intellectual, economic and social perfecting of human beings. Since natural selection did not seem to act effectively upon the civilised society of the 20th century, it was proposed that the differential reproduction of persons of

high biological and social level should be encouraged (positive eugenics), and the reproduction of those considered biologically inferior should be avoided (negative eugenics). In this way, claimed the eugenicists, the evolution of the human species could be directed through an artificial form of natural selection.

Even though the extent to which genetics was involved in many human features was at that time unknown, attempts were made in the US to apply eugenics to characteristics such as criminal behaviour, intelligence, drunkenness, mental deficiency, etc. by passing legislation that permitted the forced sterilisation of "socially defective" individuals. In Germany, the eugenics movement allied itself with the Nazi regime to provide pseudo-scientific cover for the elimination of "bad genes" by sterilising and eliminating social groups considered inferior.

Concurrently with this perverse use of genetics on humans, major research was under way concerning the identification of Mendelian features and their analysis in human populations. There can be no doubt that one of the most significant advances of the 20th century in terms of contributions to the advancement of genetics was the discovery of the physical structure of DNA by James Watson and Francis Crick in 1953, which led to the acceptance of the idea that the basic units of inheritance, known as genes, were made up of DNA which could mutate. The molecules of DNA present in a cell are organised in chromosomes, and as early as 1956 it was determined that humans have 46 chromosomes in each cell. In 1959 it was discovered that an extra copy of chromosome 21 was the cause of Down's syndrome. In the 1980s and 1990s work continued to map hundreds of genes in specific chromosomal locations. A draft version of the Human Genome Project was completed in 2003, and in May 2006 the Project succeeded in working out the full sequence of chromosome 1, the last human chromosome pending sequencing. Thanks to all this, it is now possible to diagnose a large number of adult human disorders in foetuses before any symptoms of disease appear using prenatal diagnosis and, in embryos produced by in vitro fertilization prior to their implantation in the uterus, Preimplantational Genetic Diagnosis or PGD.

What is PGD?

PGD is a diagnostic technique that has been in use since 1990, and which is associated with assisted reproduction through *in vitro* fertilization (IVF). It was initially developed as an alternative to prenatal diagnosis to reduce the transmission of severe genetic diseases for fertile couples with a reproductive risk (Braude et al., 2002), though its use has been extended to other clinical situations such as increasing the pregnancy rate in women who have experienced failures in previous IVF cycles. According to recent data, by 2004 more than 1000 children had been born in Europe thanks to the use of this technique (Sermon et al., 2007).

PGD uses standard *in vitro* fertilization, including controlled ovarian stimulation, oocyte retrieval, fertilization by intracytoplasmic sperm injection (ICSI) and *in vitro* embryo culture (Pickering et al. 2003).

The ovarian stimulation used in PGD is no different from that used in any other *in vitro* fertilization process. A number of hormones are administered over the course of around four weeks, resulting in the development of several ovarian follicles and the maturing of oocytes, which are aspirated transvaginally with ultrasound guidance. Around 80% of the oocytes collected are suitable for IVF and are transferred to suitable culture media for subsequent fertilization.

In the PGD process, oocytes are normally fertilized by intracytoplasmatic sperm injection (ICSI), a technique which comprises the direct injection of a single sperm cell into each oocyte. This method enables fertilization to take place with extremely low quality semen samples, and it can be used even in cases when there are no spermatozoids at all in the ejaculate, because sperm can be obtained directly from the epididymis or testes by means of a minor operation called a testicular biopsy. ICSI is also the preferred technique if PCR is to be used subsequently for preimplantation diagnosis, as will be mentioned below (Braude et al. 2002).

Following fertilization, embryos are examined for the presence of two pronuclei that indicate normal fertilization. These embryos are selected and transferred to suitable culture media for *in vitro* development through their earliest stages. 24 hours after fertilization, cellular division should have taken place and the embryo should have two cells. 48 hours after fertilization the embryo should have four cells, and after three days it should have 8 cells. Morula formation is on day 4, and the embryo reaches the blastocyst stage on day 5, when the inner cell mass, a discrete clump of cells destined to become the foetus, is clearly differentiated from the trophoectoderm, destined to form the extra-embryonic tissues such as the placenta and chorion (Ogilvie et al. 2005).

PGD requires the biopsy of material from either the oocyte and/or the developing embryo. The cells obtained from the biopsy are used to analyse the genetic condition of the embryo via diagnostic techniques such as PCR or FISH. Unaffected embryos are transferred to the uterus (normally no more than two) for embryo development to continue. The biopsy of the first and second polar bodies of the oocyte is minimally invasive and damaging, as there is no direct intervention on the embryo itself. Although the use of this technique generally poses less ethical problems than actions on the embryo itself, it is not the technique of choice for PGD because the analysis of the genetic condition of the embryo is technically extremely laborious and because it cannot be used when it is the male partner that carries the genetic disorder. The most common way of using PGD is therefore to obtain one or two cells (blastomeres) from three-day-old embryos that contain around eight cells (Figure 3).

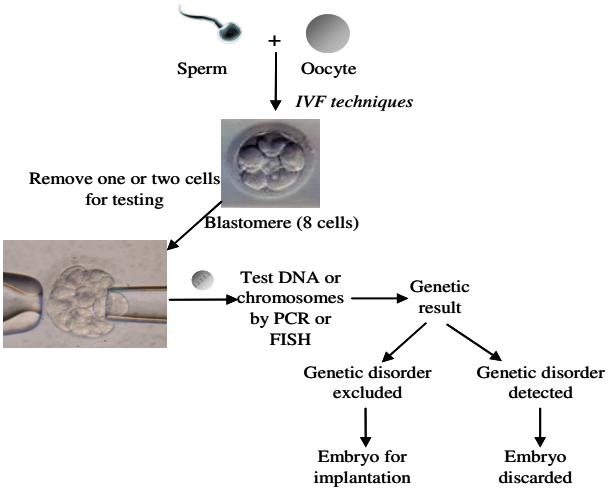

Figure 3: Preimplantation genetic diagnosis diagram.

Single blastomeres are obtained by suction by biopsy pipette after breach of the *zona pellucida* by laser, acid solution, or mechanical abrasion (Ogilvie et al., 2005). While the cells biopsied are used for genetic analysis, the embryos are maintained in suitable culture media in the laboratory so that they can continue to develop *in vitro* up to the blastocyst phase. Once the result of the genetic analysis is known, the blastocysts selected must be transferred to the uterus before hatching on day 6, so the time available for diagnosis is very limited.

Two molecular analysis techniques are generally used for the genetic diagnosis of biopsied blastomeres: Polymerase Chain Reaction (PCR) and Fluorescent *In Situ* Hybridization (FISH).

PCR is a technique that enables millions of copies of a specific, small portion of the genome to be obtained *in vitro* through the use of two DNA primers which hybridize with a particular region of cellular DNA. The technique requires prior knowledge of the sequence of the relevant portion of the genome so that the two primers, which must flank the portion of the genome to be amplified, can be designed. Thus, if the genomic DNA contains a sequence that is complementary to the primers designed, it is possible to obtain millions of copies of the portion between them, but if there is no such complementary sequence, there will be no amplification. The use of fluorescent marked primers means that several genomic regions can be analysed simultaneously, which enables diagnostic strategies to be developed for the detection of, for instance, several different mutations which may be involved in the same disease (Braude et al 2002). When PCR is to be used to perform the genetic diagnosis of the biopsied blastomeres, ICSI must have been used as the fertilization technique as the presence of

supernumerary sperm buried in the *zona pellucida* after IVF might lead to a contamination of PCR reactions with paternal DNA.

The other diagnostic method widely used in PGD is FISH, which consists of hybridation between a specific short nucleotidic sequence (probe) and the cells to be analysed. The cells are affixed on a slide and hybridized with a probe marked with a flourochrome. If they contain a sequence complementary to the probe they will be marked with the fluorochrome used and that mark will be detectable by a fluorescence microscope. This technique can be used to view various specific sequences of DNA simultaneously by using probes marked with different fluorochromes (blue, red and green) individually or in different combinations.

When is PGD used?

According to the practical guides drawn up by ESHRE PGD Consortium (Thornhill et al. 2005), PGD is recommended in two situations:

i. Patients at high risk of transmitting a genetic or chromosomal abnormality to their children, which includes single gene defects, namely autosomal recessive, autosomal dominant and X linked disorders, as well as chromosomal abnormalities (translocations, inversions, aneuploidies, etc). This application is known as high-risk PGD

ii. Infertile patients undergoing IVF with the aim of increasing the IVF pregnancy rates (for patients of advanced maternal age, and repeated IVF failure and couples with normal karyotypes who have experienced repeated miscarriages). This is known as low-risk PGD (or PGS).

a) High-risk PGD

The idea here is to select embryos free from certain genetic pathologies which may be present in or transmitted by one or both parents. These are generally monogenic pathologies or structural chromosome rearrangements. In these cases, a foetus is tested for a specific mutation when its family medical history indicates that there is a high risk that the foetus may suffer from a specific genetic disorder (>10% for chromosomal rearrangements and 25-50% for monogenic disorders), when recurrent miscarriage is related to parental structural chromosome abnormality and especially when serious health problems are expected as a consequence of these genetic disorders (Thornhill et al. 2005).

The estimation *a priori* of the risk of a genetic disorder in a descendent depends on the type of inheritance of the pathology in question. For instance, in autosomal dominant pathologies, diseases are expressed in individuals who are homozygotic for the mutated allele and also in those who only carry a mutated

copy (heterozygotes). Pathologies of this type are usually found in only one parent, and the likelihood of a descendent inheriting them is 50%.

In data collection concerning PGD in 2003, the most common autosomal dominant diseases checked for by PGD were Huntington's disease (52% of cycles for single gene autosomal dominant disorders), type 1 myotonic dystrophy (38% of cycles for single gene autosomal dominant disorders), adenomatous polyposis (5%) and Marfan's syndrome (5%). Preimplantation genetic diagnosis of these autosomal dominant pathologies accounted for 34% of all diagnoses performed to detect monogenic diseases (Sermon et al. 2007).

In autosomal recessive pathologies, diseases manifest themselves only in individuals who are homozygotic for the anomalous allele (two defective copies are needed for the disease to manifest itself). In these cases it is relatively frequent for neither parent to have the disease, though there is usually a record of its appearance in other members of both families. Occasionally the couple that undergo PGD may already have had a child who was affected by the genetic disease in question. In the case of diseases that are both autosomal and recessive, there is a 25% chance that the child will be affected when the parents are healthy but are carriers. In data collection about PGD in 2003, 31% of the cycles performed for oocyte retrieval to detect monogenic disorders were concerned with autosomal recessive pathologies, especially cystic fibrosis (43%), beta-thalassaemia (33%), spinal muscular atrophy (18%) and sickle cell anaemia (6%) (Sermon et al. 2007).

There is also a third inheritance pattern for monogenic diseases: pathologies for which the responsible gene is in a sex chromosome (X or Y). X-linked diseases (diseases for which the responsible gene is located in the X-chromosome) are more frequent because that chromosome contains more genes than the Y-chromosome. In X-linked characteristics, a distinction is drawn between dominant and recessive characteristics since individuals with two X-chromosomes (females) may have a single mutated allele for a certain gene and may exhibit the disease (in the case of dominant pathologies) or not (in the case of recessive pathologies).

According to data compiled by ESHRE (Sermon et al. 2007), specific preimplantational diagnoses for pathologies linked to the X-chromosome account for 11% of oocyte retrieval cycles performed to identify single gene disorders. The X-linked pathologies most commonly diagnosed by PGD are Duchenne muscular dystrophy (29%), fragile X (47%) and haemophilia (24%).

Males only have one X-chromosome, so if they receive a copy of the mutated allele from their father or mother they may be expected to display the disease. So in pathologies linked to the X-chromosome the sex of the child is an important factor in determining the risk of affliction. As a result, one of the ways

in which PGD has come to be used in X-linked pathologies is in analysing the sex of the embryo so that those with the greatest risk of suffering the disease can be discarded (generally male embryos). It must be stressed, however, that this use of PGD in selecting embryos by sex rather than according to specific genetic condition for the gene involved in the pathology is decreasing in the face of a relative increase in the use of PGD in other genetic diagnostic procedures.

So-called chromosomal abnormalities include a large group of genetic alterations that may affect the structure or number of chromosomes. Most numerical alterations, or aneuploidies, analysed by PGD affect the number of sex chromosomes of the embryo (X or Y chromosome). However, the cases in which PGD is used to check for structural anomalies are comparatively far more numerous: 86% of cycles of oocyte retrieval for chromosomal abnormalities concern structural abnormalities such as Robertsonian translocations or reciprocal translocations, which comprise the most frequent class of chromosome aberration analysed in Europe by PGD. (Sermon et al. 2007).

In the analysis of genetic disorders which are autosomal or X-linked, the technique most widely applied is PCR (described above), which identifies the presence or absence of allele mutations in certain genes which have previously been detected in the couple requesting the diagnosis. For chromosome alterations and the sex of embryos, however, the FISH technique is usually used. This technique enables to know the number of copies in a cell in a specific genomic region, or in more than one region simultaneously, along with their physical location and the number of copies of some specific chromosomes (detection of aneuploidies). If the intention is to check for structural alterations in the chromosomes it is necessary here also for the specific alteration carried by the parents to be known in advance. This is determined by a prior molecular analysis of the parents. However to detect numerical alterations it is more usual to use generic probes that identify the number of copies of each type of sex chromosome that exist in an embryo and the autosomal chromosomes that most frequently display aneuploidies: 13, 18, 21, X and Y chromosomes.

b) Low risk PGD (PGS)

Numerous earlier studies have shown that numerical and structural chromosome alterations increase with age and with pregnancy failure in many IVF patients (Munne et al., 1999; Boyle et al. 2001, etc.). This link has resulted in use of PGD being extended towards patients with a poor pregnancy prognosis following IVF. This new prospective application of PGD is referred to as PGS (Preimplantation genetic screening).

In this case, the objective of preimplantation diagnosis is to select embryos free from lethal chromosomal alterations, thus increasing the success rate of assisted reproduction procedures in couples with previous pregnancy failures. To that

end, patients are usually screened for the most frequent lethal chromosome aneuploidies (chromosomes X, Y, 13, 18 and 21). Implanting only embryos free from these aneuploidies considerably increases pregnancy rates in these cases.

Type	**Number of cycles**	**Proportion (%)**
Chromosomal abnormalities	529	18
Monogenic diseases	516	17
Sexing for X-linked	137	5
PGS	1722	58
PGD-SS	80	3

Table 1: PGD Cycles (and proportions) performed in Europe in 2003. (Source: data collection VI. ESHRE PGD Consortium) (Sermon et al. 2007). PGS: Preimplantation genetic screening; PGD-SS: Preimplantation genetic diagnosis for social sexing

As can be observed from Table 1, PGS is the most frequently used application in Europe and the most common indications for this application are advanced maternal age and recurrent IVF failure (Sermon et al 2007).

Alongside these applications, some assisted reproduction clinics offer preimplantation diagnosis for what is referred to as "social sexing", i.e. selecting embryos of one sex or the other for cultural, economic or social reasons.

The use of the technique in this case, in which the motives are not clinical, has sparked considerable ethical debate. Further reference will be made to this later. It is important, however, to stress that this application is relatively infrequent (see Table 1) and according to data compiled by the European Consortium the number of cycles carried out in these circumstances remained practically unchanged year by year. This is in sharp contrast, for instance, with the trend in the detection of monogenic and chromosomal anomalies, where use of the technique is gradually increasing.

c) Is PGD effective and safe?

According to data published recently by the European Society of Human Reproduction and Embryology (ESHRE), the breakdown of cases of PGD recorded by the PGD Consortium in 2003 with babies born up to October 2004 is as follows: 2984 ovarian stimulation cycles, 501 pregnancies, 373 reported deliveries and 453 babies born (295 singletons, 76 twins and 2 triplets) (Sermon et al. 2007). Records dating from the commencement of the use of PGD to

December 2003 show a total of 6200 cycles, 804 pregnancies and 1017 babies born.

To determine the effectiveness of PGD, the data on diagnoses made in 2003 compiled by ESHRE (Sermos et al. 2007) should be reviewed. These data are very similar to those that the Consortium has been compiling since 1999, and they have enabled us to work out a number of percentages evidencing the effectiveness of the process (Table 2).

In analysing the efficiency of the technique it must be stressed that an average of between 12 and 15 oocytes is obtained from each ovarian stimulation process. Most of the oocytes obtained are fertilized using ICSI, though the proportion of ICSI to IVF depends on the type of diagnosis to be used. In detecting monogenic disorders, all fertilizations take place via ICSI, because the PCR technique is used to diagnose the genetic condition of the embryo. However, in sexing for X-linked diseases, where the FISH diagnostic technique is frequently used, 26% of fertilizations take place via IVF.

Different stages of PGD	Chromosomal abnormalities	Monogenic disorders	Sexing for X-linked disease	PGS	PGD-SS
Average number of oocytes per OT	14	13,8	13,4	12	15
ART using ICSI / total ART method	87%	100%	74%	93%	94%
Embryos Fertilized/ inseminated	70%	69%	71%	57%	68%
Biopsied and diagnosed/ fertilized	74%	85%	73%	74%	69%
Transferable/ diagnosed	27%	50%	36%	36%	25%
Transferred/ transferable	72%	59%	64%	70%	81%
Foetal hearts/100 embryos transferred)	15%	17%	21%	17%	23%
Global efficiency (foetal hearts/ COC obtained)	1.2%	1.8%	1.9%	1.9%	1.7%

Table 2. Data and proportions at different stages of the PGD process PGS: Preimplantation genetic screening; PGD-SS: Preimplantation genetic diagnosis for social sexing; OT: Oocyte retrieval; ART: Assisted reproduction technique; ICSI: Intracytoplasmatic sperm injection; COC: cumulus oocyte complexes

Between 57 and 71% of the oocytes inseminated following ovarian stimulation are efficiently fertilized. The lowest fertilization rate is obtained in cases where there have been previous failures in assisted reproduction processes (PGS). The fertilization rates obtained are, in general, similar to those for assisted reproduction not related to PGD, i.e. around 80%. Only part of the embryos fertilized are successfully biopsied and diagnosed (between 69 and 85%). Following genetic analysis, some of them are ruled out because of their genetic conditions, so only between 25 and 50% of the embryos successfully diagnosed

are transferable. For various reasons, not all transferable embryos end up actually being transferred: the figure is between 59 and 81% of those embryos transferable because of their genetic condition and embryology. Finally, only between 15 and 23% of those embryos transferred will have a heartbeat (see implantation rate in Table 2). Thus, the overall efficiency of the technique, measured as the percentage of foetal heartbeats compared to the number of oocytes obtained following ovarian stimulation, is between 1 and 2%.

Sixty-nine out of 403 ongoing pregnancies (17%) presented complications, mainly bleeding and emesis. Seventeen babies were born with malformations (4%), eleven of them major malformations. Furthermore, abnormalities were found in 13 instances: four prenatally - two of which ended in termination of pregnancy - and nine postnatally. Seventeen misdiagnoses have been reported in various reports (Sermon et al. 2007): ten for PCR and seven for FISH. These data seem to indicate that the technique is relatively sound in terms of the rate of appearance of malformations following manipulation of embryos and in terms of the low diagnosis error rate. However, given the technical limitations of PGD as regards the quantity of sample available to make a diagnosis, it is advisable to check the genetic condition of embryos via prenatal genetic diagnosis as from the 11th week of pregnancy, by analysing the amniotic liquid or the chorionic villus.

An ethical analysis of PGD

In today's societies techniques concern with the beginning and end of life regularly sparks intense moral debates. PGD, in which decisions are taken concerning the beginning of life, is no exception. Many of the arguments used in this debate are concerned with religious beliefs. However, the ethical points discussed here deliberately eschew any specific religious approach. It must be stressed that our intention here is not to draw up a personal assessment of PGD and its use, but simply to highlight the most ethically controversial points and delimit the debate.

From a technical viewpoint it is important to note that PGD and PGS for aneuploidy screening are treatment options which are subject to relatively few regulations and standards compared to other diagnostic testing. This lack of regulation is striking in a technique in which obtaining the highest levels of accuracy and reliability is complicated compared to more routine genetic testing such as prenatal diagnosis. In this regard, there are no procedures in place in Europe for the accreditation of establishments that perform PGD, but merely a guide containing recommendations.

From an ethical viewpoint, establishments offering PGD must take two points into consideration: on the one hand they are dealing with an assisted reproduction procedure, with all the ethical and technical problems usually

posed at IVF units; and on the other hand they must inform and discuss with potential parents matters concerned with the genetic diagnosis of embryos. In this same regard, genetic advice should be given by qualified personnel capable of providing parents with the relevant information concerning the IVF/ICSI procedure, the risks of ovarian stimulation and ovum pick-up, the number of oocytes to be retrieved -which is greater than for regular IVF/ICSI-, the number of embryos to be transferred, the chance of pregnancy per cycle/start/ transfer, the risk of multiple pregnancy, cost, cancellation policy, etc. Parents must also be given information and brought into discussion concerning genetic risk assessment and recurrence risk, nature and severity of disorders inherited, reproductive options such as prenatal diagnosis, gamete donation, remaining childless, adoption, accepting risk without further examination, rejection of normal and affected males after sexing for X-linked disorders, number of embryos expected to be affected according to Mendelian ratios, disposal of affected embryos or undiagnosed embryos, and other points.

Consent to proceed with a clinical process such as PGD based on the greatest possible assurances in terms of the information received and planning for potential outcomes is certainly a significant aspect of our ethical analysis, but other questions must also be considered. These include the need to ensure that access to these diagnostic techniques is not limited by the financial resources of parents. It must be taken into account that PGD costs between 4000 and 5000 €, and that in most if not all European countries the technique is not covered by the public health system. Other ethical questions that must be considered include its application at the commencement of life and the implications of the method. These points are analysed below.

a) Selecting embryos based on their clinical condition

In clinical terms, the purpose of PGD is to enable couples who are at risk of transmitting a given genetic disease to increase their likelihood of having healthy offspring. The technique also seeks to reduce the risk of the mother suffering a miscarriage or having to undergo an abortion following adverse results in prenatal diagnosis (medical or therapeutic abortion). Increased efficiency in obtaining pregnancies that come to full term in couples who have suffered repeated failures in assisted reproduction cycles is, without doubt, another significant benefit in both individual and social terms, since the age at which couples have children is gradually increasing in Western societies, which entails a subsequent increase in the risk of producing gametes with chromosomal alterations.

The most sensitive point of PGD in ethical terms is obviously the positive selection of unaffected embryos and the uncertainty as to what will happen to surplus embryos (unaffected, affected and non-diagnosed). Ethical problems arising from the ethical status of the embryo are not exclusive to PGD, but rather

are shared with *in vitro* fertilization (where ethical questions are raised concerning the fate of surplus embryos) and with medical abortion (where the gestation of a foetus with malformations or genetic alterations detected by prenatal diagnosis is interrupted).

The legal position in regard to these matters differs from one European Union country to another, reflecting the different debating positions maintained in political and social life. There is usually no reluctance to admit that an embryo is an example of human life, but there are widely differing political, social and individual viewpoints concerning the moral status of embryos (whether or not an embryo is a person, i.e. a human being):

a) The pro-life position: embryos enjoy full moral status equal to that of any adult human being from the moment of conception.

b) The pro-choice position: embryos have no intrinsic moral status. Such status is acquired only at or near birth.

c) The gradualist approach: the moral status of embryos is minimal at the commencement and increases as they develop. According to this approach an embryo less than 14 days old has a lower moral status than one more than 14 days old because (according to current scientific knowledge) it is not until that point that tissue differentiation takes place, and because implantation in the uterus has not yet taken place, so continued development is not guaranteed.

For the so-called pro-life groups, preimplantational genetic diagnosis is unethical because human life begins at conception. Their position is that embryos are persons and as such they have rights, including the right to life and therefore the right to be born. They consider that there should be no manipulation of life, and that PGD is applied for eugenic purposes, since it implies birth control for individuals liable to transmit genetic diseases and the elimination of offspring affected by those diseases.

On the other hand, those opposed to this approach consider that preimplanted embryos are merely a group of totipotential cells growing *in vitro*, and that it is only when they are transferred to the uterus that they have the potential to become a human being. They argue that the decision as to whether to use these techniques is taken privately by families as part of their right to reproduction and their right to choose to have healthy children, with no intention thereby to discriminate against specific population groups. The gradualist position stresses the differences in implications between prenatal and preimplantational genetic diagnoses: the former can only take place after 11-16 weeks of pregnancy, while the latter is performed between the second and fourth day following *in vitro* fertilization. Together with the fact that in PGD fertilization is external and no physical or psychological links are established between the mother and the non-

implanted embryos, so that the trauma associated with interrupting a pregnancy is avoided, this supports the argument that PGD is ethically more acceptable than conventional prenatal diagnosis (Cameron, 2003).

The debate between these positions regarding the moral status of embryos has given rise to a great many discussion documents, and this paper is not the place where this matter can best be discussed. However, it is worth mentioning that the large number of medical abortions carried out shows that many people in many parts of the world consider the elimination of a genetically defective foetus to be morally acceptable (Leroi, 2006), and that there is a widespread trend to consider not implanting an embryo following preimplantational genetic diagnosis as more acceptable than a therapeutic abortion following prenatal diagnosis.

b) Selection of embryos by their sex

Historically, sex selection has been practiced more or less successfully in a number of ways. Methods based on the positioning and timing of intercourse and special diets are among the proposals put forward in recent studies (Levin, 1982). For example, some believe that superficial penetration and face-to-face intercourse are more likely to produce a female. Others believe that foods high in potassium and sodium and low in magnesium and calcium tend to favour a male.

Although the Universal Declaration of Human Rights and the European Convention on Human Rights consider that sex selection for non-medical reasons is intrinsically sexist, it seems unlikely that following a diet rich in bananas, for instance, in an effort to select the sex of your offspring would generate any ethical objections. But even if sex selection is generally ethically permissible, that does not mean that all methods of sex selection are ethically permissible. An obvious example is infanticide (Liao, 2005).

In PGD there are two applications that have direct links with selecting the sex of the embryo, one of them clinical and the other related not to the risk of disease but to the preferences of parents concerning the sex of their offspring (social sexing).

The former of these applications seeks to select embryos with little or no risk of X-linked genetic anomalies by selecting the sex of the embryo. Although some believe that in this case there are medical reasons that may justify application, it must be stressed that the procedure may involve discarding healthy embryos. For instance, in X-linked recessive pathologies such as haemophilia a couple in which the male parent has the disease could decide to implant only male embryos. This would ensure that their offspring would be healthy, because they would receive not the paternal X-chromosome that carries the disease but the

paternal Y-chromosome. However, there are no medical reasons for this, since female embryos carrying the allele for the disease would be healthy. Even so, some couples decide to have only sons because any daughter would be at high risk of having affected sons herself (Pennings and Wert, 2003). Another example in which clinical sex selection gives rise to debate is that of women with recessive X-linked alleles (heterozygotes), who have an a priori risk of 25% of having a male child affected by the problem. The use of sex selection in these cases enables only female embryos to be implanted which will not suffer from the disease (though half of them will be carriers). However, half of the discarded male embryos are healthy.

In social sexing the intention is to select the sex of a child on grounds of social pressure in favour of one gender (in Middle Eastern and Asian cultures sons are considered more valuable to families than daughters) or because parents wish to have a child of a particular sex. In the latter case a distinction is usually drawn between sex selection on grounds of convenience and so-called "family balancing", in which the family must have at least one or two children of one sex before they can seek one of the opposite sex. Selecting sex in response to a cultural preference for male offspring is a clear example of sex discrimination against women, and is therefore frowned upon by many groups on the international stage. However, in spite of estimates putting the number of children killed in the world at millions, especially in China and India, the use of PGD for this purpose is practically negligible compared to the use of ultrasound screening and abortion (Robertson 2003).

The most westernised version of sex selection -for reasons of convenience of the parents or family balance- is seen by some as an extension of an individual's right to control their own procreation (Bradfield, 2003). However, there is a clear trend towards other less invasive, less aggressive, less expensive and less ethically problematical techniques such as sperm-sorting. This technique separates sperm carrying a Y-chromosome (which would create a male embryo) from sperm carrying an X-chromosome (which would create a female embryo) by adding fluorescent dye to the sperm and sorting X-sperm (carrying more DNA) from Y-sperm (carrying less DNA) using a flow cytometer. This approach has proven to be 88% successful for couples seeking a girl and 73% successful for couples seeking a boy. As of January 2006, more than 1000 pregnancies have been achieved using MicroSort technology and more than 800 babies have been born.

c) New medical uses

As well as the applications of PGD discussed so far, other medical applications have been developed in recent years, including analysis of susceptibility and HLA matching for existing children.

Since the description in 1993 of the gene mutation responsible for Huntington's disease (HD), this disease has joined the catalogue of pathologies that can be diagnosed via prenatal and preimplantational genetic diagnosis, and numerous ethical problems have arisen which have been the subject of broad ranging debates. HD is an incurable neuronal degenerative disease whose onset age is usually around 40, and in which death occurs on average 16 years after onset. The possibility of diagnosing a disease such as HD –which appears after many years, during which time the individual is healthy- at a pre-embryonic stage has given rise to considerable argument as to whether or not it is appropriate to take decisions concerning embryonic and foetal development of individuals whose clinical problems will not appear at birth or in childhood but only at later stages of their life (late-onset diseases). There is no easy answer to this question, but in the case of HD prenatal and preimplantational diagnosis is considered acceptable, because of the severity of the illness and its effects on the quality of life of the future offspring. Avoiding the birth of children with those conditions reflects the desire of parents to have offspring with good prospects for an average life span (Robertson, 2003).

One of the most delicate ethical points concerning the use of PGD in late-onset diseases concerns the possibility of a parent at risk of suffering the disease expressing an interest in having a PGD performed when he/she does not know whether or not he/she will suffer it or not in the future. For at-risk persons who do not want to undergo presymptomatic testing, an exclusion test can be proposed. With such a test, only embryos that inherit an allele from the unaffected grandparent are considered as unaffected (Moutou et al., 2004). Evidently, a design of this type implies that the group of embryos that receive the genomic region in question from the affected grandfather will be automatically rejected, although only some of them would have fallen ill.

HD is an example of a late-onset disease whose diagnostic implications have been widely discussed, but we must ask ourselves if the situation is similar for the diagnosis of other late-onset diseases such as breast cancer, ovarian cancer, hereditary nonpolyposis colorectal cancer, familial adenomatous polyposis in adulthood or Alzheimer's disease. It needs to be clarified here that while HD is a serious genetic disease caused by mutations in a single, high-penetrance gene, the others late-onset diseases mentioned above involve susceptibility genes: they are multi-factor diseases in which several genes may potentially be involved, each of them with a lower penetrance, that is, not everyone with the faulty gene will develop the disease (Rice, 2006).

The application of PGD to susceptibility genes is a controversial topic which is sparking ever greater interest as further genetic and epigenetic bases for different diseases become known. Although there are no clearly defined barriers as to the medical indications for which the use of PGD is suitable, two criteria are generally applied: first, the diseases in question should involve high-penetrance

susceptibility genes, so that the probability of a child contracting the disease if the mutation is inherited is high; and second, the disease should be serious and difficult to treat (Braude 2006). This means, for instance, that PGD does not seem to be advisable for mild conditions such as asthma, eczema, etc, which can be well managed in medical practice, or for conditions such as schizophrenia, where a number of genes have been identified but there is no single gene that dictates the condition.

Finally, there is another application of PGD that poses further ethical questions: selection of embryos with identical genotypes in the human leukocyte antigen (HLA) system to those of an existing sick sibling for allogeneic haematotopoietic stem cell (HSC) transplantation. HSCs are blood-forming cells found in the bone marrow, the peripheral blood, and the umbilical cord blood. For several lethal malignant disorders, bone marrow or blood cell transplantations are currently the only therapeutic approach (Fanconi anaemia, for example). The success of a transplant depends on how well the HLA types of the donor and recipient match (Devolder, 2005). It has been estimated that in Western countries the chance of having an HLA identical sibling is no more than 15% (Pennings et al., 2002) and although compatible donors may be obtained from cord blood banks, the overall success rate of HSC transplant in a child with a sibling donor is substantially higher than HSC transplant performed with alternative donors (Pennings et al., 2002).

The most ethically sensitive point in selecting embryos compatible with a sick sibling is that embryos are selected not because they are at risk of suffering a disease but because of their usefulness as cell donors for their sick siblings. There is talk of "designer babies" and the instrumentalization of the future child.

This matter is too complex to be discussed here, as the question of instrumentalization can be approached from various directions. I would, however, like to point out certain precedents which are clearly admitted in society in which using someone as a means is not considered unethical. Some parents decide to have another child as a companion and playmate for the first one. Moreover, before PGD was available some parents with a child who needed a transplant of blood cells decided to have another child in the hope that it would be compatible and could thus save the life of the sick siblings. This is not regarded as wrong because of an instrumentalization of the second child. The fundamental technical difference with practices such as this one lies in the fact that PGD involves a selection that enables the probability of a new child being compatible with the sick sibling to be greatly increased.

No reliable data are as yet available on the potential effects on the future child of learning the reasons for which he/she was conceived in those cases where this has already happened, but here also there are different ways of tackling the problem from a theoretical perspective. Some argue that this use of the second

child goes against the need of all children to be considered and loved for themselves. Others, by contrast, argue that there are no indications that parents who seek medical assistance to obtain an HLA compatible sibling do not intend to love and care for the new child just as much as the child created naturally, or more (Pennings et al. 2002).

Conclusions

Data on the use of PGD in Europe show a clear trend towards increasing use for the diagnosis of monogenic diseases and chromosomal alterations. The fundamental ethical argument in favour of this increase is the clear psychological and physical advantage of selecting embryos not affected by certain genetic pathologies in high-risk families as opposed to the alternative of prenatal diagnosis and subsequent therapeutic abortion if the foetus is found to be affected.

These techniques are expensive (an IVF procedure must be carried out, followed by genetic diagnosis via PCR or FISH), so access to the technology must be guaranteed so that there is no discrimination in its use on grounds of the financial resources of the prospective parents, but rather on medical and technical grounds, such as whether it is suited to the diagnosis of the disease in question for that specific couple once prior clinical points such as the specific mutation carried by the families, the reproductive capacity of both parents, etc. have been reviewed.

The use of PGD as a way of selecting the sex of embryos is declining as X- and Y- sperm sorting techniques become more efficient and specific diagnostic tests are developed for the mutated alleles in X-linked diseases.

It seems unlikely that a catalogue of monogenic and multi-factor diseases will be established in the future for which PGD is medically and ethically recommended, considering the rapid advances that are being made in the field of biomedical research. The best way of limiting the use of PGD to applications that are considered technically, clinically and ethically appropriate would probably be to establish detailed guidelines providing consensus-based information protocols and genetic advice, which could be applied by organisations that carry out PGD, along the lines of the guidelines established by the ESHRE PGD Consortium (Thornhill et al., 2005). There should also be a review by a bioethics committee of the specific procedures in which PGD is to be applied, to monitor the proper application of the technology.

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Ethical Problems Fighting Genetic Diseases: Informed Consent in Genetic Research & Biobanking

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Abstract

This paper aims to promote discussion about a new range of ethical problems within the life sciences: those entailed by the use of biobanks in order to advance genomic research and help identifying and fighting genetic disorders. This is accomplished by means of a short review of the scientific and bioethical literature, as well as of the main international normative declarations. Some examples of genetic diseases, and some ethical problems they arise, are mentioned so as to introduce the main rules of good practice (privacy, consent, and confidentiality) in research. The emergence of biobanks is shown to compromise to a certain degree those traditional rules. For instance, while most documents and declarations at the global level insist on the need of genuine informed consent, the demands of research bring about new "open consent" models, which are making their way into legislation. Finally, the situation in Spain is presented as an example of this trend.

Keywords: *Biobanks, genetic databases, open consent, genomic research*

Introduction

One day in the 1960s, a biology graduate called Mayana Zatz was faced with a woman who sought genetic counselling because her sister had three sons affected with Duchenne muscular dystrophy (DMD), a muscle-wasting disease with no cure. The woman was getting married and was worried that any sons she might conceive would develop the disease. All Mayana could tell her was that she would be taking a gamble with any sons she conceived, and that it was up to her if she wanted to take the gamble.

Mayana decided to focus her research on that disease, and this decision became the beginning of a scientific career which made its way to the pages of the journal *Science*. On 2 March 2005, Mayana's efforts were instrumental in the legalization of research with embryonic stem cells in Brazil. Now she is the coordinator of the University of São Paulo's Human Genome Research Center, and many things have changed in the field of genetics. Research is being conducted around the globe to find a cure for DMD, or at minimum a therapy able to mitigate some of the devastating effects of this disease. However, even today, in Brazil one among five babies who die in the first year of life have a gene-related disorder (Zatz, 2005).

1. Diagnosing genetic diseases: some problems

Major progress has been made in elucidating the genetic basis of monogenic disorders, such as DMD, and in applying this knowledge in clinical practice. Much of this work pertains to obstetric and paediatric practice, and to the management of rare but significant groups of genetic disorders. One of those monogenic disorders is Huntington's disease (HD), an inherited neurological and degenerative illness that causes involuntary movements of the body, intellectual decline and some affective problems. Unlike DMD, in HD the onset of symptoms usually occurs in mid-life; like DMD, and while selected treatments can relieve symptoms in some individuals, HD is currently incurable.

Each male and female child of a HD-affected person has a 50% risk of developing the disease and is often referred to as "being at risk," a state described as living with an abiding sense of impending threat. The availability of predictive testing since 1993 alleviates the necessity for such a wait and provides other benefits, but it also generates challenges for at-risk individuals and their families, as the possible test outcomes have significant implications for future life courses (even if the test result is negative). Findings suggested that predictive testing was regarded as a significant life decision with important implications for self and others, while the right "not to know" genetic status was staunchly and unanimously defended. (Taylor, 2004)

HD is the most intensively studied area of predictive testing within genetic counselling. When predictive testing became available, it was decided that careful studies and the development of protocols would be needed, and thus a set of recommendations was issued by the International Huntington Association and World Federation of Neurology in 1994. After the first years of testing, follow-up of those given both high-risk and low-risk results has shown that both groups can suffer social and emotional problems. Those given low risks often do not experience the anticipated sense of relief, and may suffer survivor guilt. Experience has shown that many at-risk individuals have decided not to test. (Clarke, 1998)

This debate on prenatal screening, diagnostic and predictive testing in research and clinical practice for HD and other rare single-gene (monogenic) disorders has led to the emergence of three main rules dealing with consent for use of DNA samples, information disclosure with regard to family members, and confidentiality of research (Thomas, 2004):

1. *Privacy*. Every person is entitled to privacy: the right not to be obliged to disclose information about his or her medical history, or genetic characteristics.
2. *Consent*. Genetic information should only be obtained from persons when they have given their genuine consent. Consent is genuine when the information has been communicated appropriately and agreement is given freely.
3. *Confidentiality*. Where an individual has chosen freely to disclose private genetic or medical information, the disclosure should be treated as confidential. This means that information should not be communicated to others or used for new purposes without the consent of the person disclosing the information.

Now, a major challenge to genetic medicine is posed by "complex" conditions, which include common diseases such as diabetes, heart disease, cancer, and psychiatric illness, as well as variable responses to treatment, including lack of efficacy or susceptibility to adverse drug responses. Those conditions are the present target of genomic research and pharmacogenomics. But, according to the journal *Nature*, genomics research thrives on the sharing of biological samples and information about them, and is therefore affected by new and prominent ethical questions. Many of those questions deal with the nature and use of biobanks—the organized collection of biological samples and associated data, ranging in scope from small collections of samples in academic or hospital settings to large-scale national repositories. (Cambon-Thomsen, 2004)

Understood as collections of samples, biobanks have existed for a long time, but new developments in genetics and bioinformatics have transformed them into much more powerful tools. To a certain extent, the creation and use of new biobanks might compromise the traditional rules of good practice in research. For instance, an important source of material for establishing biobanks is

previously stored tissue samples, which could be put to a use completely different from that originally intended (Guthrie cards, originally used to screen infant blood for phenylketonuria, might be used for additional genetic screening). This possibility raises ethical concerns, which authorities are responding to by introducing specific regulations, such as the recent Biomedical Research Act (*Ley de Investigación Biomédica*, 2007) in the Spanish context, which we will examine below.

Some of the most pressing issues include the use and storage of genetic information (Thomas, 2004), its commercialisation and the need to determine what is understood by "benefit" in this context (Chadwick, 1999), and the existence of a duty to participate in genetic research. We must take into account that the benefits of research could be shared more widely by those who profit, and that there might be a duty to participate in research that could move medicine forward on the basis of solidarity. According to Ruth Chadwick and Kare Berg (2001), *"It is questionable whether individuals should be free, from an ethical point of view, to refuse to help in an effort to relieve suffering for what could be regarded as trivial reasons, such as refusing to allow samples to be reused for research on drug abuse because of the disapproval of drug users. The rules that govern informed consent evolved from a very different situation from the one that now pertains, and now might be the time for a fresh ethical perspective."*

2. A new ethical framework?

A sizeable part of the scientific community holds the view that genetic data should be considered a common good if they are of importance for the progress of medicine and the life sciences (Knoppers and Fecteau, 2003). This view reflects the sciences' dependency upon the ability to observe, learn from, and test the work of others. Without effective access to data, materials and publications, the scientific enterprise becomes impossible. Yet recent studies show a disturbing trend; increasing secrecy, cumbersome materials transfer agreements and complex licensing structures have made more difficult the sharing process on which science relies. "Because they were denied access to data, 28% of geneticists reported that they had been unable to confirm published research," an article in the *Journal of the American Medical Association* reports. (Campbell et al., 2002)

Although the information content of any medical data (including genetic data) is highly contextual and dependent on the particular circumstances, it is generally understood that human genetic data have a special (or even "excepcional") status, since they can be predictive of genetic predispositions concerning individuals and that the power of predictability can be stronger than assessed at the time of deriving the data. However, health and illness are both dynamic states that result from complex interactions of multiple genes, other molecules

and environmental factors. However, and notwithstanding the possible benefits of genetic tests, the truth is they say very little about biological processes; in the context of multilevel biological insight, genetic "exceptionalism" is a fallacy. (O'Malley et al., 2007)

The traditional way of reconciling the demand of publicity and the demand of confidentiality has been to protect the donor's identities by means of anonymization procedures. The possibility of tracing the person from whom sample and data were derived varies according to how the samples are linked to their donor identity in the database. Following Cambon-Thomsen (2004), samples and their associated information can be:

- Identifiable. The identity (or personal and unique social security number) of individuals is directly attached or linked to the samples or data.
- Traceable or coded. A code is attached to them and the correspondence between code and identity is physically separated from sample and data. A limited number of people can connect the code to the identity.
- Encrypted. There is a further level of protection through encryption (that is, the code is transformed into several characters that are linked to the code with the intervention of a third party). This third party intervention will then be required to trace individual identity.
- Anonymized. The link has been irreversibly cut between sample/data and the individual identity.
- Anonymous. There has never been any possibility to link the sample and the attached data to a given person.

However, the more sophisticated the encoding or encryption system, and the more exchanges of data and samples occur, the more difficult it becomes to destroy samples and generated data. In addition, it is sometimes necessary to keep data for further follow-up, and to use the original sample as a control. In such cases, some suggest the importance of making clear to the donor that withdrawal at a given date will ensure that no new results will be generated and that the remaining sample will be destroyed, even though this does not guarantee the destruction of existing data. This is a matter of controversy; for instance, Cambon-Thomsen believes that when scientific data have been produced with the consent of a person, this person should not have the right to ask for their destruction, but only for their anonymization. She acknowledges that such a view is shared by many scientists, but not by all ethics committees; consensus on these issues is still a work in progress.

3. A global approach to informed consent in genetic research and biobanking

In April 4, 1997, the Council of Europe's "Convention on Human Rights and Biomedicine" was signed in Oviedo, thus providing a sort of "Bioethical Constitution" for many European countries. As a general rule, the Convention states (art. 5) that any *"intervention in the health field may only be carried out after the person concerned has given free and informed consent to it. This person shall beforehand be given appropriate information as to the purpose and nature of the intervention as well as on its consequences and risks. The person concerned may freely withdraw consent at any time."*

Later that year, on November 11, the UNESCO adopted the Universal Declaration on the Human Genome and Human Rights. Its first article asserts the human genome as the underlying foundation for the *"unity of all members of the human family, as well as the recognition of their inherent dignity and diversity"*. In a symbolic sense, the declaration continues, the human genome is the *"heritage of humanity.*" Again, there are grounds to suspect that relying only on DNA to reveal identity, ancestry and human nature will lead to an impoverished understanding of us (O'Malley et al., 2007). Still, the Declaration is very clear in specifying that the benefits from advances in biology, genetics and medicine, concerning the human genome, shall be made available to all, in order to offer relief from suffering and *"improve the health of individuals and humankind as a whole."* (art. 12)

The UNESCO's International Declaration on Human Genetic Data (adopted 16 October 2003) insists on the necessity of a truly informed consent as a requirement for the legitimate use of human samples and genetic data: *"It is ethically imperative that clear, balanced, adequate and appropriate information shall be provided to the person whose prior, free, informed and express consent is sought. Such information shall, alongside with providing other necessary details, specify the purpose for which human genetic data and human proteomic data are being derived from biological samples, and are used and stored. This information should indicate, if necessary, risks and consequences. This information should also indicate that the person concerned can withdraw his or her consent, without coercion, and this should entail neither a disadvantage nor a penalty for the person concerned."* (art. 6.d)

At least since the Nuremberg Code was enunciated in 1947, informed consent is a necessary (but not sufficient) condition for ethical and lawful experimentation involving humans, but the Code does not mention consent forms. Rather, it has been understood that the goal of informed consent is to provide protection by making sure that potential research subjects understand the research they are being asked to volunteer for, its risks, its benefits, and its alternatives. Informed consent is a process, not a form, and only after that process occurs is documenting it useful. As George Annas has written, to protect the rights of

research subjects, the first question about every aspect of the consent process should be *"how will this help the subject?*" and not *"how will this help the researcher?"* (Annas, 2001)

However, a look at how informed consent takes place in genetic research shows that the traditional theory of informed consent is of little use here. We must take into account that it might not always be feasible to obtain competent, informed and understanding individual consent, especially when there is the possibility of future (at present unforeseeable in detail) use of samples for research (Chadwick and Berg, 2001). Let us remember that the debate on biobanks was initially shaped by the Icelandic case of *deCODE genetics*, the company that 10 years ago merged medical, genetic and genealogical databases in order to "create a new paradigm for healthcare [...] turning research on the genetic causes of common diseases into a growing range of products and services" (Casado da Rocha, 2004). This case has become a well-researched paradigm of the tangled relationship between science, industry, politics, and values, showing how genomics is a battlefield for the conflicting interests of private and public sectors, pharmaceutical industry and healthcare workers, academics and scientists—each with its own "logic" (Baca, 2006).

According to Árnason (2004), a major moral problem in relation to the *deCODE genetics* database project in Iceland is that the emphasis placed on technical security of healthcare information precluded discussion about the issue of consent for participation in the database. Árnason distinguishes between three aspects of the database and shows that different types of consent are appropriate for each, arguing that the traditional demand for informed consent is neither suitable nor desirable in this case.

This "traditional demand" can be found in the Declaration of Helsinki, the most cited and authoritative document in medical research, in art. 22: "In any research on human beings, each potential subject must be adequately informed of the aims, methods, sources of funding, any possible conflicts of interest, institutional affiliations of the researcher, the anticipated benefits and potential risks of the study and the discomfort it may entail. The subject should be informed of the right to abstain from participation in the study or to withdraw consent to participate at any time without reprisal. After ensuring that the subject has understood the information, the physician should then obtain the subject's freely-given informed consent, preferably in writing. If the consent cannot be obtained in writing, the non-written consent must be formally documented and witnessed."

As Chadwick (1999) noted, a debate that focuses on traditional principles risks ignoring new challenges brought about by advances in medical technology. Informed consent requires that individuals are given information about the research, and in the case of biobanks this is often impossible to do at the time of

collection, since these tools are designed to be used by many researchers, and for many projects well into the future (Kaye, 2004b).

To solve this problem, Árnason (2004) proposes a written authorisation based on general information about the project as an alternative to informed consent and presumed consent in database research that includes unforeseeable future research projects. Although the validity of the general authorisation does not require a specific discussion of the research to be conducted, its risks and benefits, Árnason (2004) provides a list of items which must be discussed as part of the process of obtaining authorisation. These safeguards are similar to those set forth in art. 10 of the European Directive 95/46/EC, on the protection of individuals with regard to the processing of personal data. This Directive, issued by the Parliament and the Council of Europe in 24 October 1995, requires that, in order to obtain the data, the donor must be provided with information about the identity of the data controller, and, most importantly, about the purposes of the processing for which the data are intended.

But, as Jane Kaye (2004a) has argued, there is a difference here. The Declaration was thought for a single research project, within a medical setting and involving physical intervention: "informed consent" was necessary in such a setting in order to protect the bodily integrity of research subjects. On the other hand, what the European Directive has in mind is the processing of personal data, and the requirement is one of "explicit consent", which does not require informing individuals about risks and benefits.

The most radical argument agains the necessity of informed consent in genetic research is that of Ants Nomper (2005), who argues that biobanking has proved the Declaration of Helsinki a "paper-tiger" that cannot be taken seriously, both *de facto* and *de iure*. When dealing with large databases for research, he proposes that the most appropriate approach to consent is "open consent" in which subjects provide samples and data for future research, whose details (ends, risks, benefits) cannot be specified at the time that consent is given, under a set of safeguards or conditions that must be in place, and cannot be altered after this kind of consent is obtained.

On the other hand, Kaye (2004b) argues against handing over information and samples without allowing participants some control over what happens to those in an unpredictable future. The possibility of individual opting-out of a research must be implemented, as well as collective measures in order to engage the population as partners in research (and not only "subjects"), along with the procedural safeguards to maintain public trust.

This emphasis on partnership is also made by Hansson (2006), who argues that subjects have interests both as participants and as end users of the research. If access is limited to researchers, confidentiality is warranted, and the procedures

governing the research are open to public and democratic control, then (he argues) most research using human biobanks may be carried out with a single act of open consent, on the basis of general information available when collecting the samples. Another proposed solution has to do with "consent waivers", in which research subjects entrust their consent with an independent third party to decide whether subsequent research using the biobank is consistent with the original consent provided by the subject. (Schickle, 2006)

4. Assessing the new Spanish legislation on biobanks

As of completion of this paper (2007), research is taking place at the University of the Basque Country (Dpt. of Genetics) on the genetics of Huntington's disease age of onset in the Basque population. Samples are being collected in the main hospitals in Bizkaia (Basurto, Galdakao, and Cruces), using an informed consent procedure approved by the Basque Research Ethics Committe (CEIC-E). In December 2008, the donor's identities, samples, and related data, will be stored at the Basque DNA Bank (UPV/EHU et al. 2005). This biobank is the brainchild of a new player in the health & research Spanish scene: the Basque Foundation for Health Innovation and Research (www.bioef.org), which seeks to provide a framework for communication and co-operation between the various sectors involved in health research, development and innovation.

Until now, there was not a specific piece of legislation in order to regulate this and other biobanks, but the legal situation has changed. Proposed by the Government on September 15, 2006, the law on Biomedical Research has been recently approved by the Spanish parliament. According to the Minister of Health, its aim is to encourage biomedical research while ensuring the highest possible level of health, ethical and legal guarantees to protect the general population. As for informed consent, the legislator says she has chosen a "flexible, middle way" in between open and specific consent: the initial act of consent might include consenting to further, related but unspecified uses of the samples. Thus every specific act of consent might include consenting to data and samples being used in other research lines, "related to the one initially proposed", by the same team or another one (art. 60.2). The degree of relationship remains unspecified and open to interpretation. There are at least two ways of understanding project relatedness:

1. In a strict sense, individual research projects are related when they are "lines" pursued by the same team, with the core theory and the body of previous research changing only slightly from study to study, and much of the prior work being reused in each line of research.
2. In a wide sense, given the speed of scientific development in the area of genetics and the vast spectrum of potential research hypotheses that may arise and can legitimately be addressed by biobanks (Schickle, 2006), there is no easy way to predict the range of their possible uses. If a researcher wants to use a

biobank, it is because she wants to test some hypothesis with the samples and data it stores, so hypothetically her research project is related to the one which originally produced the sample or data. In order to confirm the relationship, access to the biobank must be granted beforehand.

If the requirement of project relatedness is understood in the second sense, what the proposal puts in place is virtually a single-act open-consent non-commercial model, with opting-out and other procedural safeguards. (This is especially visible if we compare the Government's proposal and the last draft of the law after amendments were made; this draft, approved on March 20, 2007, leaves even more room for uses of the samples not intended by the original donor: cf. art. 58.2.)

According to the law proposal, consent can be obtained upon the collection of the tissue, or at a subsequent time (art. 60.1). Interestingly, the Declaration of motives (III) says that the lawmaker has foreseen transitional measures concerning *"biological samples obtained for any purpose before the passing of this law, so as to make possible their use for research, while at the same time protecting the donors' interests"*.

These measures are listed in the Second transitional provision of the law: existing samples may be used for biomedical research when the donor has consented to it, or when they have been anonymized; when the process of granting consent entails an "unreasonable effort" (a disproportionate amount of time, work or other expenses), or when the donor is dead or cannot be located, use of the data requires only the approval by a Research Ethics Committee, which will examine whether the following criteria are met: (1) the research is of general interest; (2) lack of data would make research impossible or less effective; (3) there is not an explicit objection to it; and (4) the confidentiality of personal data is granted.

Conclusion

The emergence of new biobanks is shown to compromise to a certain degree the traditional rules in genetic research. Although there are pressing issues concerning privacy and confidentiality, the most visible area of disagreement has to do with informed consent. There is a gap between theory and practice, as most documents and declarations at the global level insist on the need of genuine informed consent, but this requirement faces serious problems of implementation. Thus, the demands of research are bringing about new "open consent" models, which are making their way into legislation. Open consent has practical benefits from the perspective of researchers, but it needs strict individual and public safeguards in order to be morally acceptable. An interesting line of work could be to promote the convergence of interests between researchers and subjects, by means of transparency and benefit-sharing,

thus fostering partnership in research. The new Spanish law attempts to strike a balance between research needs (efficiency) and ethical demands (integrity), while promoting the interests of research institutions and companies; however, it sets in place a virtually open consent model, far away from the traditional demand of informed consent; time and further work will be necessary in order to assess its success.

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The Commodification of Biotechnological Advances: the Case of Private Umbilical Cord Blood Banks

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Abstract

This article examines the problem of the commodification of biotechnological advances. In the first section, we address this issue from the point of view of a fair social distribution of these sanitary resources in general and of biotechnological advances with medical applications in particular. The conclusion reached by this paper is that the market mechanisms currently in place give rise to a profoundly unjust distribution of this type of resources. In the second section, the general criteria described in the first section are applied to the problem of whether to authorize private umbilical cord blood banks. The conclusion reached is that the creation of these institutions gives rise to a more unfair distribution of umbilical blood cells than one based on a system of public blood banks that are supplied by donations.

PART I:

BIOTECNOLOGY AND COMMODIFICATION

Introduction

One question that is just as important as whether determined types of research in the field of biotechnology are ethically correct is what interests determine the objectives of research in general and how the benefits of the aforementioned are distributed. The problem of the "commodification" of biotechnological advances has a direct impact on these questions.

In order to specify the sense in which we refer here to "commodification" we begin by formulating three questions: a) a question of scientific policy: What should be researched? b) a question of technological policy: What experimental results should be put into practice? c) a question of distributive justice: How to distribute the benefits of scientific progress?

Commodification, understood here as the purpose of obtaining an economic benefit (for profit) is a determining factor in the responses to these questions.

Possibility of raising questions

Some authors consider that the development of science and technology (technoscience) responds to its own internal logic. Namely, the problems undergoing research are the product of the questions raised by the results of earlier research.

In this respect, Zygmunt Bauman maintains that one of the characteristics of Modernity is the preponderance of means over ends. This would be the key characteristic of what he denominates "technological response", which can be summarised by the principle "it is done because it can be done". (Bauman 2005:213-14). According to Bauman, there is no place for technological policy, since it is not an external end that determines the implementation of potential experiments. It is the possibility of doing them that determines they are done. And the Polish theorist uses the example of the first moon landing: it was done because it was feasible, not because space missions had any usefulness. First Man went to the moon and subsequently people asked if it had any usefulness (BAUMAN 2005: 213ss. and 240)

This example is only convincing at a first glance. The "space race" should be studied within the context of the Cold War. The United States and the Soviet Union were vying to demonstrate their superiority to the world in this field. Therefore, the U.S. government earmarked a large amount of effort and resources to achieve the objective of being the first to put a man on the moon. It

was a full-scale propaganda exercise. It was not a "technological response" but a political response. It was not undertaken merely because the technology existed to do it. Other things could have been achieved. However a political decision directed the efforts towards that objective.

Concerning the "logic of scientific investigation" it is true that the researcher's findings raise pose questions that may become the object of future research. But these "internal" problems are not the only possible answers to the question "What should be researched?" Scientific study can be directed or redirected towards other objectives "from outside". Furthermore, an answer has to be given to the question concerning what amongst the multiple internal problems should be researched. Hence, in a text yet to be published, Ascensión Cambrón points out that in most cases external interests determine the object of scientific research. And, according to the author, the problem of scientific responsibility and the limits of freedom of research[1] need reconsidering.

There is room, therefore, for the question on scientific policy and that on technological policy. Moreover, it is possible to distinguish analytically between these two questions. It is true that we find ourselves in the "technoscientific" age and the boundary between basic and applied research is hard to ascertain. But it is also true that there is a difference between the world "of the laboratory" and the "real" world (CALLON 2001:76-104). The question of what problems we should take from the real world into the laboratory would be a question of scientific policy. And that concerning what results produced in laboratory we are going to take to the real world would be a question of technological policy.

Patents and commodification

The commodification of the two former questions in the field of sanitary research in general and biotechnology in particular has been the result, in large part, of the special importance that patents have acquired in this field. The search for the patent, the procurement of a patentable result has changed the scientific *ethos* by directing the interests of researchers towards potentially lucrative objectives.

The patent is often an intermediate step between research and the applied research. Because the scientist that patents a new medication, or a gene, or a living being does not usually have the resources to obtain administrative authorizations, carry out tests and sell the product. In the paper entitled "The right to health faced with the AIDS reality" (CAMBRÓN 2002), Ascensión Cambrón highlights the extent to which patents have commodified scientific and technological policy in the field of AIDS research. In that work she analyses the

[1] The text is entitled "La superación del derecho por la biotecnología".

case of *stavudine*, one of the most extensively used antiretroviral drugs in the treatment of Acquired Immunodeficiency Syndrome. The research that led to the discovery of this substance was publicly funded. But Yale University patented the discovery for its own benefit and conceded the exclusive commercial rights to a pharmaceutical multinational to market the product.

The procurement of something "patentable" (i.e., with commercial value) was a determining factor in the direction of Yale's scientific research. Additionally, the prospect of making a profit was decisive in the multinational company's decision to purchase the rights – exclusively – and place this drug "in the real world". Nonetheless, *stavudine* remained out of the reach of the millions of AIDS-infected Sub-Saharan Africans[2].

The question of distributive justice

Distributive justice concerns the question of the fair distribution of the benefits provided by biotechnological advances, especially in the area of health. The formulation of this question may appear obvious to anyone with common sense. However, a number of authors analysed by Carlos Lema (LEMA, 2002) believe that justice has no place here. The authors in question are North American political philosophers, such as Nozick, Engelhardt or Buchanan, who label themselves as "libertarians" but who would more appropriately be classified as "neoliberals". These writers argue that justice is indifferent to the distribution of sanitary resources in general (which include biotechnological advances). In the view of the "libertarian" philosophers, the problem can be likened to the following situation: imagine a well-off middle class person has some surplus spending money and does not know whether to buy a jetski or go on a Caribbean cruise. If we know only this information, the choice this person makes raises no problem "of fairness". We do not feel motivated to quality as "fair" or "unfair" whether she buys the jetski or goes on the cruise. Our sense of justice will be indifferent to these decisions.

Some writers regard individuals as the sovereign owners of their bodies who can choose how much of their income they wish to spend on caring for them. The choice between taking out health insurance or taking piano classes is similar to that of buying the jetski or going on the cruise: it is indifferent from the viewpoint of fairness.

Nonetheless, and contrary to what neoliberal philosophers hold, the problem of the distribution of biotechnological advances is more akin to the following

[2] I personally had the opportunity to observe the commodification effect of patents on scientific and technological policies in my paper on human gene patents (ESTEVEZ ARAUJO 2002).

situation: imagine that in a village in the heart of Colombia, the mayor, who also happens to own most of the cultivatable land in the area, is riding in the latest model of Mercedes driven by a smart chauffeur while the children of the village have to walk two hours to get to the communal school, located in another district, because there is no public transport. This situation will probably have an effect on our sense of justice. We would wonder whether it is fair to see a person riding around in a car while the others (especially the children) have to walk. We would also be inclined to find out whether there is a direct link between the absence of public transport and the mayor riding in a Mercedes

This intuitive analogy may be further strengthened by a number of considerations that support the relevance of the question concerning distributive justice in relation to biotechnological advances with sanitary applications. First, one should take into account that these advances are a form of socially-produced wealth and, in the same way that it is relevant to consider the problem of distributive justice with regard to wealth in general, it is pertinent to formulate it in relation to this form of wealth in particular. Second, health is a basic asset; it is a condition that enables people to pursue other potentialities. Hence, the distribution of the means to conserve this asset or to recoup it is a relevant problem from the point of view of fairness. Above all, given the basic character of the health asset, that sanitary resources (and biotechnological advances) be distributed in a way so that the greatest number of people has access to it is a demand that stems from the principle of equality.

State or market?

If we accept that the distribution of biotechnological advances with sanitary applications poses significant problems of fairness, the next question is what the most appropriate mechanism would be to ensure a just distribution of these resources. In principle, there appear to be two possible answers: the market or the state.

In a book recently translated into Spanish, Ronald Dworkin (DWORKIN 2005) addresses the problem of the distribution of sanitary resources, which he believes is relevant from the point of view of fairness. In order to establish the fairest way to distribute these resources, Dworkin imagines an ideal market model. This imaginary idealization envisages two implausible conditions in the existing capitalist economies: the first that wealth is equitably distributed; the second, that everyone has updated information on medical innovations and their applications. This imaginary model would be appropriate to determine the fairest distribution of sanitary resources. Specifically, the type of insurance that everyone would be willing to take out in that ideal situation would permit the user to specify which services should be covered by the public heath service and financed through taxes (or through a compulsory insurance policy in Dworkin's

words). The remaining health care would be provided through private insurance policies for the individuals based on their personal preferences.

The role of these absolutely implausible ideal models (as is Rawls' starting point) is to create the impression of a possible conciliation between the individual freedom to decide what type of life each one of us wishes to lead, and a supraindividual viewpoint, which excludes those individual decisions whose costs are unacceptable to the rest of the people. However, in reality, it is not like this, since these models are not conceived to be put into practice, but to place its author in a position that allows him to decide in the place of others. What the author (in this case, Dworkin) imagines the individuals would choose in these circumstances is what he really uses as a criterion to determine what should be done (and does not develop the mechanisms of people participation that could be put forward based on the ideal model)[3].

Regardless of what one may think of these rational fireworks, only dialogical in appearance, the truth is that the distribution of sanitary resources by the market in the real world is profoundly unjust. One need only think of the history of *stavudine* according to Ascensión Cambrón that we referred to above, or the fact that the greatest amount of resources allocated to research by the private pharmaceutical industry is currently aimed at discovering a cure for baldness, which although not humanity's most pressing sanitary problem does hold the promise of great profit.

Whatever the case, the crux of the issue lies in the problem that the driving-force of production and distribution of "merchandise" focuses on the search for immediate economic returns rather than on the debate surrounding ideal models and their capacity to attain supraindividuals ends. This dynamic directs research and development towards the most profitable products, paying attention to the interests of the wealthy in detriment to the more needy sectors of society.

The commodification of sanitary resources and biotechnological advances poses not only the problem of "distortions" caused by a desire for profit, but also the problem of the "privatization of risks" (BAUMAN 2005: 230), which arises from business advertising strategies.

The privatization of risks consists of presenting them as eventualities that can be tackled in an individual manner, while a healthy life, exercise, an appropriate diet would be the main determining factors of a healthy life. The risks derived from pollution, pesticides, cancinogenic colorants, or stress generated by job

[3] Nonetheless, an exception should be made in Dworkin, who suggests several mechanisms of real participation in order to specify and determine the general criteria, although the latter derive from his ideal model. This question will be examined later on.

insecurity are left out. The causes of sicknesses are chiefly presented as individual and their remedies as well.

This is the best approach for the interests of the industries that manufacture and sell foodstuffs, health products, sports products or services linked to a healthy life. These products or services are turned into merchandise that is consumed individually or in the family. Every anxiety, every fear that has a connection with the state of the body can be turned into a new source of commercial gain. It is a question of exploiting this fear and offering a product aimed at combating it. As Bauman writes, anxiety is a very important source of profit for businesses.

Moreover, the privatization of risks brings commercial advertising to the fore. And in the permissible context of advertising, "informed consent" loses much of its meaning. This tends to become a mere formality, since what really makes the "customer" decide is not the information that the company is obliged to provide, but the effect that the messages have on their psyche. Indeed, informed consent originated a patient participation mechanism in the decision as to which medications to take (RUBIO and TRIGO, 2005). If we transfer this to a universe of commodity acquisitions that are the object of advertising and for whose evaluation there is an absence of technical competence, we transform it into an entirely insufficient protection mechanism. Nor would a safeguard certifying the truthfulness of the advertising compensate, as this would result in a contradiction. Truthful, objective or dispassionate information is the antithesis of advertising, which is emotive, deceitful in essence, symbolic, aimed at the subconscious, designed to arouse desire… In short, it is manipulative. What connection is there between driving a specific model of car and the driver's sexual performance, or between a detergent and an elegant figure? Nonetheless, these associations are regularly made in the commercial advertising we see every day on television.

In opposition to a distribution of biotechnological advances that are the result of the combined effect of profit-making and advertising in an extremely unfair world, this article defends the fact that the production and distribution of these resources must be guided by health policy considerations and that its recipients should not be treated as "customers" but as users of a public service. This does not imply that all decisions should be left to the state. There is a need to open up democratic participation channels so that citizens can have a direct say in these questions, since these will have a decisive effect on their lives[4].

[4] In another article I addressed this question and the mechanisms that would enable "lay" citizens to have a say in the decision-making of technically complex issues (ESTEVEZ ARAUJO 2005). Dworkin also points to the need to implement means of real participation for citizens (and not merely ideal situations in which philosophers may decide "as if" they represented the point of view of "reasonable" people). Specifically, Dworkin suggests allowing representatives from different groups to take part in the decision-making processes of sanitary agencies, and that

PART II:

THE CASE OF PRIVATE UMBILICAL CORD BLOOD BANKS

Formulation of the problem

One current problem to which the considerations concerning a just distribution can be applied is the question of whether to authorize private umbilical cord blood banks. This issue became headline news in Spain after the birth of the Infant Leonor. Her parents, the future king and queen of Spain, gave their permission to extract the blood from the umbilical cord and have it stored in a private foreign blood bank, as these institutions were neither regulated nor legalised in Spain. From the outset, this measure may be regarded as showing little consideration for the Law of the state that Felipe and Leticia will represent in the future, God willing. In any case, this issue is already the subject of debate in other European countries and in EU institutions.

In order to understand this debate it is necessary to have some prior information. The first refers to the blood from the umbilical cord. This is obtained by puncturing the vessels of the newly-born's umbilical cord. The umbilical cord blood is rich in embryonic stem cells (or haematopoietic stem cells), i.e., they can be transformed into any type of cell present in blood. At present the transplant of these cells is an effective therapy for patients with leukaemia, for example. Since 1988, more than 6,000 such interventions of this type have been carried out around the world.

Today there are public umbilical cord banks in Spain and in other European countries. These banks are supplied through donations provided by parents on the birth of their child. The banks' "stocks" are set aside for patients requiring transplants. The recipients of these haematopoietic stem cells extracted from the blood must be "compatible" with the donor's, in the same way as blood transfusions (although the compatibility or incompatibility is not exactly the same as that of blood types). There are networks of public banks that can be consulted whenever necessary to find out if any of them contain cells of the necessary characteristics required by the recipient. The public regulation of

public opinion should be also consulted on health policy-related issues. He recalls the experience of the citizenry meetings that took part in the definition of public sanitary assistance in the state of Oregon (Medicaid) (DWORKIN 2005). This type of experience (which has also been carried out in France and Denmark) highlights the fact that, if information is provided to them, the "lay" citizens who are interested can participate constructively in the decision-making processes on questions of technological, health and research policy

umbilical cord blood banks functions on a similar basis to that of organ transplants: it is free of charge, altruistic, anonymous, etc.

Private umbilical cord blood banks offer another type of service: they agree to extract and store the stem cells from umbilical cord blood and place them at the disposal of the donors in the event that they (or, better still, their children) need them. This is akin to someone depositing an amount of blood in case that person might require a blood transfusion in the future. Private banks charge for their services. Therefore, unlike the public banks, which are free, the private banks are profit-making entities.

The legal situation in Spain

The legal situation of private umbilical cord blood banks became somewhat blurred after the case of the infant Leonor. In the first place, there was a European directive from 2004 regarding the legal framework of human tissue and cells that did not specifically prohibit this type of bank (Directive 2004/23/CE of the European Parliament and Council, of March 31 2004, relative to the establishment of quality and safety standards for donation, procurement, control, processing, conservation, storage and distribution of human tissues and cells). The transposition deadline of this Directive concluded on April 7, 2006.

In March 2006 the government passed a Royal Decree establishing activities relative to the use of human tissues (ROYAL DECREE 411/1996, of March 1, regulating the activities relative to the use of human tissues). This regulation cannot be considered a transposition of the European directive, because nowhere does it state so (and the rules of transposition must specifically indicate their nature).

The Royal Decree did not explicitly prohibit the setting up of private umbilical cord blood banks, but it ruled out the possibility of allow them to function as businesses. This is so because, among other things, it established that the activities of the banks will be "not for profit" (art. 5.3) and because "the equitable distribution" of their deposits must be guaranteed[5]. In these conditions,

[5] The RD establishes in its art. 16.1 "The *Bank shall use the tissues in such a way as to guarantee their maximum benefit. Likewise, it shall guarantee an equitable distribution thereof in the case of an insufficient availability of a tissue*".

In this sense, Karen Olivier writes: "In my opinion, this clause establishes a basic point of connection between the public banks and the private banks, subordinating the profit-making interests of private banks to the sanitary efficacy of the tissue in question. In other words, in the event of insufficient availability of a tissue needed for a surgical implant, this would be fairly distributed in order to guarantee it be used to maximum advantage. Therefore, the private banks must cede the tissue they hold in deposit whenever necessary". (V. *Cuadernos electrónicos de la URB*, http://www.urb.es/ce/QiZ8745938392QQ)

the private banks can neither guarantee their customers the availability of their deposits, nor can they obtain a profit for the rendering of their services. Therefore, any interest in creating them would disappear, even if they were not officially prohibited.

Several days after the passing of the Royal Decree, the Government of the Community of Madrid issued a specific law on umbilical cord blood banks (DECREE 28/2006, of March 23, of the *Consejo de Gobierno*, regulating the establishment and working framework of the umbilical cord blood banks). This law did explicitly allow private umbilical cord blood banks and authorized them to charge for their services. This Decree was developed in the Order of April (ORDER 837/2006, April 6, by the Minister of Health and Consumption of the Autonomous Community of Madrid, regulating the necessary requisites for the authorization and accreditation of the blood deposits from umbilical cords within that Community) and in May the first authorization was granted to the company Vidacord to operate a private umbilical cord blood bank in the Community of Madrid.

The Ministry of Health and Consumption challenged the Community of Madrid's Decree before the Superior Court of Justice, which issued a cautionary suspension of the law on May 4 2006. Clearly there was an intense political debate surrounding this issue between the central government of the PSOE and the Community of Madrid governed by the PP. There is no information to know whether the autonomous government's interest to hastily authorize private blood banks was due to some type of specific political or economic pressure.

Whatever the case, the ROYAL DECREE 1301/2006, of November 10 solved the dispute. This regulation is a transposition to the juridical Spanish system of the European directive on banks of cells and tissue (in the second final item, this circumstance is explicitly stated).

In this Decree, like in the previous one, the Government does not prohibit the private banks, although it establishes some operation principles characteristic of a public bank. In that sense, it reinforces the gratuitous character of the services that the banks of blood of umbilical cord lend. This way, in the article 3 establishes that: "The activities of the establishments won't have lucrative character, and they will be been able exclusively to rebound the effective costs of the borrowed services for the development of the authorized activities". The regulation guarantees the equal distribution of the resources of the banks in function of the necessities of the patients. Thus the art. 15.2 establishes that "The establishments will preserve and store the cells, so that their maximum use it is guaranteed". Also, and according to the principle of equal distribution, "they will guarantee the access to the cells in the cases of insufficient stocks (...)" Therefore, the use of the cells of blood of umbilical cord cannot be reserved to the donor or its relatives with exclusive character. This position is reiterated in

the article 27 that establishes that "The autologous application will be limited to the case of therapeutic procedures of demonstrated effectiveness in medical established indications". "[In another case] the cells will be available for their alogenic application".

Arguments

Within this context, it is important to examine the arguments for and against private umbilical cord blood banks.

The most important and best documented text on the subject is the report by the European Group on Ethics. This document, drafted at the request of the then President of the European Commission, Romano Prodi, is entitled "Opinion of the European Group on Ethics in Science and New Technologies to the European Commission Nº 19 16 March 2004: Ethical Aspects Of Umbilical Cord Blood Banking".

The report sets out an impressive raft of arguments against the authorisation of private umbilical cord blood banks. Nonetheless, in the operative part of the document an unusually impassioned argument is made in the defense of free enterprise. This "freedom", which was only mentioned in passing in the main argument is used to counter all the other considerations, without offering any reason or grounds for such an extraordinary "evaluation". The report, therefore, opposes the prohibition of private banks solely on the grounds of the principle free enterprise, even though it recommends that these institutions should not be endorsed.

It is fairly reasonable to assume that the Spaniard Puigdoménech, member of the EGE, disagreed with the resolution and forms part of the minority in favor of recommending a ban on private banks. This assumption further corroborated by the relative detached stance that Dr Puigdoménech himself takes with respect to the resolution in an article published in *El País* in March 2006[6]

The incongruity of defending the authorization of private umbilical cord blood banks merely on the basis of the principle of free enterprise becomes even more apparent in an article by María Casado, who is held up as an expert in "bioethical" questions[7]. The article begins with a reference to the report by the European Group on Ethics in order to inform the reader that private umbilical cord blood banks "offer a service with no real possibilities of therapeutic use". Nonetheless, despite this, and after a "careful" deliberation, she concludes that "it is less a question of establishing prohibitions than of (...) supplying citizens

[6] PERE PUIGDOMÈNECH: *Una opinión europea*, EL PAÍS - Sociedad - 03-03-2006

[7] In *La Vanguardia,* 05/03/2006

with reliable and rigorous information - not advertising – in order to obtain a truly "informed consent". In other words, private umbilical cord blood banks need not be prohibited, but they should be obliged to notify in their advertising that the service they offer is completely useless. By applying this curious principle that "it is not a question of establishing prohibitions" to other similar contexts, we reach the conclusion that fraud should be authorized provided the swindler notifies the victim in writing of his intentions and objectives, so the victim can give his "informed consent" to be swindled.

Irrespective of this type of incongruity, the reasons expounded in the EGE document are sufficiently compelling to back the argument against the authorization of private umbilical cord blood banks. They are as follows:

First, it is a blatantly heartless system if we compare it with the public system of altruistic donations. Indeed, in a letter published in *El País*, several donors reproached the selfish attitude of the prince and princess of Spain for reserving their daughter Leonor's umbilical cord blood for her exclusive use.

Second, the context of pregnancy and birth are situations in which parents can be easily manipulated by businesses that sell these services. The father and, especially the mother, who like no-one else perceive the vulnerability of her future child and who want to safeguard it from all possible risks, present or future, are easy prey for advertising that promises miraculous future therapies based on stem cells and can be made to feel guilty if they deprive their offspring of the possibility of benefiting from them.

Third, (and this is the most important argument), the cells extracted from the umbilical cord currently have no concrete therapeutic use for the individual for whom they have been extracted. Hence, the European Group's report clearly states that "that is no evidence that umbilical cord blood will be useful in a subsequent transplant"; that "there is no medical evidence to support the validity of an autologous transplant [for the donor him/herself] of umbilical cord blood"; that "the autologous nature does not imply any advantage"; that "of the 2,500 – 3,000 transplants carried out [up to 2004], all originated from donors"; that "there is no truth that one's own cells are preferable to those from a donor"; and that "applications of stem cells from the umbilical cord are merely hypothetical". The argument collapses under its own weight: "Commercial umbilical cord blood banks offer a service that, at present, has *no real use* in terms of therapeutic possibilities. These banks promise, therefore, more than they can offer".

If in the event (today purely hypothetical) that one day a breakthrough is made to support the fact that the conservation of one's own haematopoietic cells has a real usefulness, then, as the report clearly states, this service should be assumed by the public health system and not be reserved for those who have the

economic resources to pay the almost 2,000 euros that Vidacord is currently asking for its services.

Conclusion: blood for all - and free!

The authorization of private banks would be a major blow to public banks, because the usefulness of their reserves for carrying out transplants of this type of cells depends not only on their quantity, but also on their variety. Public banks must have sufficient stocks and all varieties of existing types of cells in order to meet therapeutic needs. The opening of private banks would lead to a reduction in the potential number of donors and also a reduction in the variety of the deposits. Fewer people and fewer blood types would not benefit transplants.

Furthermore, the commodification of the deposit and conservation of umbilical cord blood cells would be to the detriment of the users of this service themselves. Since they are paying for something that currently has no use and there are no prospects that it will be useful in the near future.

To summarise, we can confirm that the authorisation of private umbilical cord blood banks would be to the detriment of public assets and would be prejudicial for all concerned than the exclusive maintenance of public donation-based establishments. In other words, the existence of private blood banks would currently give rise to a less fair distribution of this type of sanitary resource than the system, based solely on public banks. According to the considerations of distributive justice and all the others put forward, not only should the setting up of private umbilical cord blood banks be discouraged, but they should be specifically banned. This is the solution taken in Italy[8] and it is the one that should be taken in the EU in defense of a fair distribution of sanitary resources in general and of the by-products from biotechnological advances in particular.

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Is there any Specific Lesson to be drawn from the South-Korean Forgery?

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Abstract:

This paper explores some consequences and lessons we may extract from the Woo Suk Hwang forgery case in two papers on *Science*, in order to find whether there are specific ones attributable to research on stem cells. After briefly recalling the circumstances of the case, shared aspects related to scientific fraud and peer-review system in general are first considered. Then other consequences common to research involving humans are indicated, focusing on exploitation of co-workers and malpractice with donors, in order to highlight the importance of the issue of consumption of eggs (availability and efficiency) in those experiments and in the fraud. Next, specific aspects related to human stem cell research are taken up, ranging from the drawbacks of racing against other and legislation to evaluation of the scientific justification of research on embryonic stem cells and demand or a more careful assessment of cost benefit of the techniques proposed. All this brings to a broad questioning of, on the one hand, the epistemological grounding of the research strategy based on oocytes and, on the other, of the treatment of those subjects in the media. In the conclusion some specific lessons are extracted and a warning against gratuitous *ethicization* is placed.

Keywords: *cloning, epistemological grounding, ethics, human embryonic stem cells*

Introduction.

Since ten years ago we have witnessed awesome achievements in several areas of research directly connected to genetics. From the cloning by nuclear transfer of a mammal (Dolly, Wilmut et al. 1997) to the work on stem cells (Thomson 1998), and through the development made in the Human Genome Project till its partial completion in 2000, key aspects of the human biological constitution have been newly exposed to technological intervention.

Out of those, the research on human stem cells under the label of therapeutic cloning (or regenerative medicine, in a less dramatic appellation), has very particularly deserved a good deal of attention in the last years. Within this context, the trigger of this paper is what might be called the Woo Suk Hwang case.

We may just remind here how it all began three years ago when a paper from Hwang's lab stirred up quite a scientific commotion. The paper, published on the march 12th issue of *Science* (Hwang et al. 2004), reported "Evidence of a Pluripotent Human Embryonic Stem Cell Line Derived from Blastocyst", claiming to have obtained "human stem cells after somatic cell nuclear transfer" (p. 1670) and therefore showed "(…) the feasibility of generating human ES cells from a somatic cell isolated from a living person" (p. 1674). A second and even more striking paper, appeared a year later in the june 17th issue of the same journal, continued that work and offered "Patient-specific Embryonic Stem Cells Derived from Human SCNT Blastocysts", claiming to have obtained 11 human embryonic stem cells from patients with diverse health conditions.

Both papers, one by one, were decidedly hailed both in the scientific as in the general media and gave a strong push to the prospects of research on human embryonic stem cells, contributing to engender the belief that success and therapeutic application were closer than expected. Unfortunately, nothing developed as envisaged and rumours, denounces, problems and small confessions begin to move on.

On December 16th 2005, after the first reports of misconduct, regarding particularly ovules acquisition (the first ones dating actually as far back as June), and the beginning of denounces by former team members, *Science* inserted two erratum notes. Then so called problems and mistakes with the pictures and some data were disclosed and admitted, forcing preliminary petition of retraction of the 2005 paper, official academic investigation was announced, concern spread out, … and a first report of the investigative committee said that there was no evidence to support the claims of that paper. The end of the story is also well known: the final report from the Investigation Committee of Seoul National University, issued on 10th January 2006, concluded that both papers were fraudulent (Normile et al 2006).

The importance of this outcome can hardly be dismissed: it meant the occurrence of a double fraud in a "sensitive" and landmark area (human

embryonic stem cell) "perpetrated" in a first rate widely circulated and highly influential journal (*Science*). The wide coverage in the news of the alleged results first and of their fraudulent nature later, is having and will have all sorts of consequences for the scientific endeavour itself, mainly in frontier areas, as well as on the trust regarding scientific standards or on the confidence publications might aspire to.

In this paper I will explore some consequences and lessons we may extract from this case in order to find whether there are specific ones attributable to research on stem cells.

General aspects regarding fraud.

There are, first of all, quite obvious general consequences related to the actual practice of science that we might separate into two groups: those aspects related to the very forgery, falsification of data and results, or to methodological mistakes; and those issues related to the pitfalls and shortcomings of the peer review system.

Pure fraud in the sense of deliberate misconduct, as seems to be the case we are dealing with, does not seem to be frequent but it definitely happens, even if it somehow comes in degrees opening a wide range in terms of public acquaintance or damaging impact. Just to mention a more innocuous example, one recent case is that of Jon Subdø, a Norway researcher, in *The Lancet* in 2005. He said to have analyzed a public health database and claimed to show that taking anti-inflammatory drugs can reduce the incidence of mouth cancer. Supposedly the study was based on the scrutiny of the "lives and lifestyles" of 900 people but finally it was showed to have been made up (see Marris 2006). It has been reported to trigger the decision to change research policies in Norway but, unfortunately, it adds to other cases in raising questions about the effectiveness of peer-review system to detect and prevent fraud.

Then we have a more populated set of several kinds of blunders more or less severe that, in general, are variously detected and retracted sooner or later. For instance in a recent issue of *Neuron* (53: 463, 01 February 2007), the authors included the retraction of a paper published the year before (Neuron 50: 359–375; May 4, 2006) due to "serious irregularities in several figures" that were essential to support the conclusions (see Doglio et al. 2007).

With respect to the peer review system, it is well known that its nature, and methodology as well as its limitations and strengths are being subjected to all kinds of scrutiny of diverse depth and ambition, in general and well before this case (Couzin 2006). An almost undisputed foundation of the system, though, is trust (Kennedy 2006) and this is precisely what fraud violates.

We may, therefore, say that both of them, risk of fraud and limitations of peer reviewing, are issues and problems "permanent" in the scientific activity, not specific of investigation on stem cells or any other particular area. It is also apparent that both have somehow counteracting forces.

On the one hand, fraud is difficult to keep silent in a collective (not individual) and very competitive context, as we may infer from the short lapse of time needed to unveil the cases pointed out as examples. Even though the Hwang case was more complex and profound, the fast pace at which the events ensued since December 2005 to January 2006 is quite revealing.

On the other, journals take every measure they can to reinforce controls of quality and standards of truthfulness at the evaluation of submissions. At this respect, besides the ordinary implementation of editorial rules, we may identify exceptional initiatives taken both before and after the stem cell scandal. For instance, a large study of the practice of peer-review was underway, implicating three prestigious medical journals: *The Lancet*, *Annals of Internal Medicine* and *BMJ* (Giles 2006). In this study it was facilitated to investigators full access to every step and aspect of the peer-review process in order to evaluate the procedure, and the results are said to "…give qualified thumbs up to current editorial practices" and "… may also go some way to dispelling widely held doubts about peer review" (Giles 2006, 252). Not surprisingly, despite the independent and prior motivation of the study, connection to the Hwang case is unavoidably made:

> Horton [editor of The Lancet] adds that the study could also help improve public understanding of peer review. *"The timing is good, he says, because questions about editorial standards are being asked in the wake of the scandal surrounding the South Korean stem-cell scientist Woo Suk Hwang, who published two widely acclaimed papers later found to have been faked."* (Giles 2006, 252).

Regarding reactions directly triggered by the publication of those forged papers in *Science* we cannot but highlight *Nature*'s editorial "Standards for papers on cloning" (19 January 2006) conveying the outcome of their own survey on refereeing procedures. Though discarding "independent tests as a condition for publishing cloning papers", the journal explicitly encourages researchers "to seek independent verification", warns that "extraordinary claims require extraordinary proof", and advices to "use independent repositories of critical samples" (*Nature* 2006, 243).

Notwithstanding the responsibility journals have and their willingness to abide by it, the last paragraph of this editorial piece is quite remarkable in warning all that the issue has a more wide-ranging dimension which implicates a whole set of agents sometimes too prone to place the blame just over the shoulders of scientists

"The Hwang debacle reminds us that science is largely a self-correcting process in which scientists, editors, reviewers, journalists, funding agencies and institutions all play crucial corrective roles." (Nature 2006, 243).

We will turn to this in the last part of this paper, but now let's first consider briefly another group of consequences of the Korean case.

Consequences common to research on human subjects.

There is a second group of consequences that are more specific but not yet affecting only stem cell research. We can classify them as consequences common probably to any kind of research involving human subjects (related but different in research with animals).

They include, very particularly, the exploitation of co-workers of inferior status as well as any kind of malpractice with not-scientifically related donors, since it seems that all of this has happened in Hwang's laboratory. As it has finally been disclosed donors were paid for eggs despite statement on the contrary (but see erratum post date 16 December 2005 in Hwang et al. 2004) and junior lab member were among the donors (who were pressed to donate).

These aspects, notwithstanding their seriousness, at first view could be considered collateral with respect to our subject here, but they are quite meaningful, though, due to their role in the revelation of the fraud and in its very content.

It is now established that the existence of pressures on members of the research team to donate eggs triggered the first anonymous denounces to an investigative TV program (Sei Chong and Normile 2006) 2006). The first official acknowledgments of wrongdoing were also linked to the way of obtaining eggs and related payments. Hence, distrust on the reliability of published results fed on falsehood and irregularities concerning donations.

However, it is even more significant that the papers did not only lied about the origin and acquisition of eggs, but as well about the number of them that were used in the experiments. This is not a small detail but amounts to one of the central aspects of the forgery: beyond the main achievement of cloning human embryos and deriving stem cell lines, another important success of the studies was the extremely high efficiency claimed. The second paper reported using less than 20 eggs for each cell line, what implied reducing practically one order of magnitude the requirements known for other mammals (Normile et al. 2006, 156). The final report of the investigative committee confirmed that Hwang's team have got 2061 human eggs, well beyond the 427 they said to have used in the experiments allegedly conducing to both papers (Normile et al. 2006, 157). We will turn to this aspect of the forgery in the next section, in particular

regarding the consequences for the future development of research on human *embryonic* stem cells.

Specific aspects related to human stem cell research.

We will now examine those aspects and issues that we can more specifically attach to research on human embryonic stem cells.

First of all, it seems we have assisted to one of the worst cases of race against others, the ambition to outdo any other competitor regardless of means. Eagerness to race to be first is very common in science and, if you want, even beneficial as incentive to move ahead, but it is getting risky too. As Caplan & McGee wisely (and early on indeed!) advised, *speed kills*:

"Speed kills. This warning is sage advice. Too bad it's confined to motor vehicle operation. It is badly needed in science". (Caplan & McGee 2005).

But what makes this aspect a specific one regarding research on human embryonic stem cells is that it might be also considered a *race against legislation*, taking advantage of USA banning, as Caplan & McGee said, or of further legal restraints in other countries. The rather restrictive legislation on those kinds of experiments in most countries was under revision in a good number of them (the European Community itself and several of its members), precisely during the period when the experiments were being conducted by Hwang's team, and more permissive regulations were foreseen (as recently, for instance, in Spain). In this sense, it is not unreasonable to think that a more or less deliberate desire to rush before more research groups would be able to investigate, might have had a perverse effect on the reliability of results.

Nevertheless, being first is not just something sought after by eager scientists but by prominent journals too and this adds a new layer of complexity and risk to the whole issue. As professionals frankly admit:

"…, Science, like other high-profile journals, aggressively seeks firsts: papers that generate publicity and awe in the scientific community and beyond. The practice comes with some risks, critics say, because by definition firsts haven't been replicated" (Couzin 2006, 23)

We will turn to this when considering the role of the media in the state of affairs that we are beginning to describe.

Another different set of questions are related to what we may wonder whether it is not too weak a justification of experiments, as far as *specific* and *particular* good reason is concerned, because what we find is that they are grounded in just very general (and of course very well minded) prospects of medical application.

Similarly, it seems that no serious consideration of cost-benefit relation is being made beyond the securing of donors and funds for acquiring oocytes needed for experimentation: in a presumed therapeutic goal that should be applicable to a great quantity of cases and individuals it is not considered seriously, as part of the equation, the personal cost, probable ethical problems, economic temptations, etc., of a necessary means for the therapy as it is the availability of eggs in great numbers. This is why this aspect of the fraud, lying about the number of oocytes used in the experiments, is so important. Ultimately, we have to take into account that the main answer to criticisms and restrictive policies regarding investigation with human embryos, rests on the claim of the potential greater benefits to be obtained through clinical application in regenerative medicine. But one thing is the quantity of eggs that might be used in a reduced number of experimental settings around the world and a very different one, a whole disparate scale, how many would be needed first to advance therapeutic applications and then to develop and practice interventions on patients in a regular basis. To this respect we could read in the article in *Science* reporting the conclusions of the committee at Seoul National University that:

"… many researchers say the unravelling of Hwang's work resurrects the question of whether the technique will ever be efficient enough for routine clinical application." (Normile et al. 2006, 156)

Regardless the scepticism we may entertain with respect to these pledges of cure, we are entitled to ask defendants of the technique to incorporate these queries into their theoretical appraisals.

Moreover, unfortunately perhaps for some sort of researchers, but fortunately I think for the good shape of biomedical research in general, nowadays we can no more ignore the *indirect* costs/difficulties of a technique. The same way as we can no more disregard, for instance, the consequences and costs of global warming in the assessment of the cost/benefit of energy production through fossil fuels, or the cost/consequences of handling and disposing of nuclear waste when judging the possibilities to reopen the nuclear road to energy, we cannot either ignore the cost/difficulty of getting a great amount of eggs to make a technique, beyond the experimental dimension, a potential therapy available to a host of patients (I insist, let's not forget that the justification for those research attempts rests on medical promises). Besides, in the extremely hypothetical scenario of medical application, we may end up facing all sorts of social issues, stemming from the confrontation donors versus recipients, which may render the whole justifying strategy –therapy– futile.

All this his leads us to two sorts of questions: one, a direct epistemological issue regarding how deeply the scientific grounds of those investigation have been

evaluated; another, an indirect one related to the scientific provision of information to the media and their transfer to the public.

The first questioning is motivated by the need to emphasize the importance of a thorough epistemological grounding, specially in those sorts of research lines, in order to ask how deeply has the biological ground of those investigation been pondered and justified in general. More in particular, we should be able to know how seriously the comparison with other avenues of research, as adult stem cells, umbilical cord, amniotic liquid, etc., has been made. It is obvious that here it would re-emerge the issue of how to make a serious and adequate calculus of cost/benefit because, for instance, if it were the case that those other techniques would render less immediate or apparently successful results, even then, we might wonder how would they fare in the end if we took into consideration ALL the costs of each technique (note that I explicitly intend to make an epistemological point and not moral one at all). And finally, we could also question another alleged strongpoint of the technique: its better prospects to avoid rejection in transplantation, because, again, how seriously have been considered the limits of this approach if we have to admit as dogma that everything relevant to this problem lies just in the nucleus and therefore we do not need to worry any further about the immune system despite our scarce knowledge of it.

The second questioning refers to the media treatment of those research results and the, seemingly unavoidable, hype that accompanies them. It is enough to remember how the first paper in 2004 was reported as well as the second one the following year: cure for degenerative diseases was almost around the corner and replacement cells would be available nearly at will. But this was riding on a tide starting already with the cloning of Dolly in 1997 and the subsequent uproar over human cloning that ensued, without pause until the present day. We could, of course, if not justify at least understand and endure this exaggeration, admitting that it is natural as far as it touches so central aspects of human nature. But examples of less delicate cases may easily be recalled as, for instance, the now forgotten alarm around the *2000 effect* in computers or any other of your choice. This part of the problem belongs clearly to the mass media and their ways to pick and present the news. However, it is becoming more and more imperative to analyze also the very provision of information by researchers or academic journals to those mass media that are going to play the multiplying role. Again, we may feel understanding if we take into consideration the conditions and needs of current practice of science, requiring the wider possible resonance into the public in order to secure the funds, both private or public, necessary to go on with research.

Nevertheless, whether considering these mitigating circumstances or not, the net effect is that the public is getting an information highly biased, overestimated, partial and even contradictory, specially in areas related to biomedical investigation, where this (*mis*)information is joined to dramatised ethical overtones, as we will consider in the next and last section.

In any case, as one expert said to *Science*, a solution to this would probably amount to a broad cultural change:

"… studies are rarely accepted as dogma until they're replicated, says Altshuler, a distinction often lost on the general public –and sometimes other scientists– amid the hype that envelops firsts such as Hwang's paper. Says, Altshuler, 'A culture that wanted to see things reproduced before making a big deal out of them would probably be a healthier culture" (Couzin 2006, 24)

Unfortunately, I cannot pursue this topic here because it is too wide and would take us too far. Besides that, Miguel Moreno Muñoz has already carefully dissected it in his excellent work regarding the *"Rhetoric and ethic in the social communication of research with stem cells"* (Moreno Muñoz 2007) and I would refer the reader to it.

Conclusion. Lessons for stem cells research.

Besides the general epistemological warning introduced in the previous section, which is always at the root, I claim that we may extract the following three specific lessons for stem cells research:

a) We could use this experience to search ways to separate those epistemological issues, in case they are intended to be made from a secular perspective, from criticisms inspired by particular moral or religious convictions, which may use some of the same arguments (for instance the call for other research, as adult stems cells, or even the defence of women rights, etc.) but with a different purpose.

b) We could use this experience to begin separating just potential benefits from actual assessment of specific techniques, experiments or lines of research: the principle I think we should keep in mind is that *promise of cure is not privative of any* of those, at least not in the form of such generic pleas as the ones which have been used.

c) We could use this experience, vice versa, to begin separating more global ethical issues from specific problems raised by a particular technique: I am afraid that a calm and careful survey would reveal that *few, if any, of the presumed ethical issues posed by human stem cells research are diverse of those which might be raised in general for almost any technique of assisted fecundation*, or by the issue of abortion, or by problems of justice and freedom.

What I am pointing to is that we face the risk of *ethicization* in the sense of leaned focus on alleged but dramatic ethical issues regardless of scientific or epistemological grounding. By this term I intend to describe what is mainly a

media phenomenon, i.e. it is more frequent and has more impact through the mass media. It refers to the increasing tendency to accompany the information regarding any advance relative to knowledge or technology with the complement of a presumably or intended ethical questioning. So we are immediately warned that what has been described might pose an ethical question or problem or challenge, etc., even before being adequately informed in detail about what it is all about (Umerez 2003, 2004).

I hope therefore that all, or some, of these considerations may contribute to overcome the current situation where *moral over-concern coexists with epistemological over-indifference* or, in other terms, *exaggerated moral distrust coexists with exaggerated epistemological trust* (Umerez 2006, 2007). Because this state of affairs (should I say 'state of mind'?), concocted mainly by the mass media but not just on their own as we have noted, does not provide the best circumstances to deal with the numerous and serious challenges, both as promises and risks, that investigation on human stem cells opens up before us.

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Genetic Biobanks: Ethical Challenges from Systems Biology

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Abstract

Plans for human genetic databases at a large scale were started at the second half of the 1990s; the best known cases being those of the Icelandic Health Sector Database (run by deCODE genetics), the UK biobank, or the Estonian Genome Project. Quite often, those projects have been backed up by determinist and reductionist understandings of molecular biology. Partially as a consequence of the results of the Human Genome Project, this way of looking at the genome has been generally rejected and replaced by a more systemic view, which holds that the functions of genes depend upon many contextual factors, so that the properties of organisms are the result of complex interactions among the genome, other cellular components and environmental factors. In this paper we examine some consequences of this paradigm shift upon biobanks and the research it enables: biobanks with general purposes will only be useful if they are linked with many other databases. We think that this need of linking genetic data with others concerning personal health or lifestyle must be specially taken into account when discussing the ethical aspects of biobanks.

Keywords: *bioethics, biomedical research, genetic exceptionalism, genomics, informed consent.*

Introduction

In the late 1990s, several research projects in genomics were launched involving the creation of biobanks and other databases. Biobanks are the organized collection of biological samples and associated data, ranging in scope from the small ones in academic or hospital settings to large-scale national repositories (Cambon-Thomsen, 2004). As such, biobanks are not novel, but recent avenues open in genomic research have renewed interest in their putting in place. As genetic databases, biobanks store samples of biological material (tissue, blood, hair, etc.) in order to obtain data from their DNA. They have a dual character as collections of both samples and data, and many of the ethical problems considered in relation to them have to do with the possibility of reusing the samples for purposes other than the original.

The Icelandic database project was one of the first attempts to create a big population biobank for pharmacogenomic research (Etxeberria & Casado, 2001; Arnason, 2004; Casado, 2004; Casado & Etxeberria, 2004). It raised concern at the international level, and alerted about the basic ethical problems involved in the running and setting up of these databases. The case was especially interesting because of the way the database project was launched, by means of a Law approved by the Icelandic Parliament and involving all citizens. The database was triple, as medical, genetic, and genealogical data were cross-examined. Most controversially, the medical records were transferred by a "community or presumed consent", although individuals were eventually allowed to opt-out. Another controversial issue was the commercial nature of the enterprise, as the exclusive rights of use of the database were granted to deCODE, so that information carefully compiled and preserved by a national public health system became a valuable asset for a private company.

Although the Icelandic database project was paralyzed by a legal judgement from the Supreme Court in November 2003, new database projects have appeared in Europe. Some of those "human post-genomic biobanks" are the Estonian Genome Project, the UK Biobank, or GenomEUtwin in Finland (for a useful table of comparison, see Cambon-Thomsen, 2004).

In a more modest scale, research is taking place at the University of the Basque Country (Dpt. of Genetics) on the genetics of Huntington's disease age of onset in the Basque population, with samples being collected in the main hospitals in the Biscay region (Basurto, Galdakao, and Cruces) using an informed consent procedure approved by the Basque Research Ethics Committe. In December 2008, the donor's identities, samples, and related data, will be stored at the Basque DNA Bank. This biobank is a project of the Basque Foundation for Health Innovation and Research (www.bioef.org), which seeks to provide a framework for communication and co-operation between the various sectors involved in health research, development and innovation.

Both in the Icelandic case and the more recent ones, a sizeable part of the discussion has revolved around the question of how to regulate this research tool in order to improve efficiency while respecting the rights of privacy, confidentiality, etc. of the donors.

In this paper we address some of the ethical problems raised by the possibility of reusing the samples stored in biobanks, as well as some of the models of informed consent proposed to collect them. Given that we have examined in other paper the problems related to informed consent and the governance of biobanks (see Casado & Etxeberria, forthcoming), here we will focus on the problems related to the gaps between scientific knowledge about DNA and its social perception. As a matter of fact, many debates have uncritically assumed the thesis of the exceptionalism of genetic information with respect to other kind of data (Murray 1997, Etxeberria & Garcia-Azkonobieta 2004). We would like to argue that this thesis cannot be hold in the context of today's biological insight; even more, that this exceptional image of genetic information creates ethical problems by itself. The goal of this paper is to analyse how this situation affects to biobanking, in relation to both its research strategy and the very definition of what a biobank is. From a systems biology standpoint, it seems that "general purpose" biobanks, intended to be used by many different research projects or lines, will only be useful if they are linked to extensive collections of other data and samples. But discussion of the ethical aspects of genetic databases often remains focused only on the molecular level, and not on the necessary association between genetic and other (medical, lifestyle, etc.) data. This should be taken into account in any further discussion of the ethics of biobanking.

Informed consent and open-ended research

The Declaration of Helsinki establishes a well-known demand for the ethics of research:

In any research on human beings, each potential subject must be adequately informed of the aims, [...] the anticipated benefits and potential risks of the study and the discomfort it may entail. (Declaration of Helsinki, art. 22)

But this demand or requirement to inform the subjects has had to face new challenges brought about by advances in medical technology, most specially with those having to do with general purpose biobanks (Chadwick, 1999). In this new context it is difficult to adequately inform subjects about the aims, benefits and risks of the intended research, since biobanks are designed to be used by many researchers, and for many projects well into the future. In other words, biobanks are a resource open to many research ends, and the question is then, How to inform of those that are already unknown?

To this Nomper (2005) has answered that there is no such need to inform, since the reality of biobanking has proved the Declaration a "paper-tiger" that cannot be taken seriously, both *de facto* and *de iure*. He proposes that the most appropriate approach to consent in this new context is an open consent in which subjects provide samples and data for future research, whose details (ends, risks, benefits) cannot be specified at the time that consent is given, under a set of safeguards or conditions that must be in place, and cannot be altered after this kind of consent is obtained.

Kaye (2004) argues against handing over information and samples without allowing participants some control over what happens to those in an unpredictable future. The possibility of individual opting-out of a research must be implemented, as well as collective measures in order to engage the population as partners in research (and not only "subjects"), along with the procedural safeguards to maintain public trust. This emphasis on partnership is also made by Hansson (2006), who argues that subjects have interests both as participants and as end users of the research. If access is limited to researchers, confidentiality is warranted, and the procedures governing the research are open to public and democratic control, then (he argues) most research using human biobanks may be carried out with a single act of "open" or "broad" consent, on the basis of general information available when collecting the samples.

Systems biology and the death of genetic exceptionalism

At the end of the past century, the ELSI (Ethical, Legal and Social Issues) approach was introduced along with the Human Genome Project in order to discuss relevant issues in genomic research. The kinds of problems perceived at the time were often framed by a reductionist and determinist vision of genes; the influence of the image of the genome as the "book of life" has been such that the belief of its special or exceptional value for the study of life was pervasive. Genes or the genome are considered to be the relevant domain for the diagnosis and cure of diseases, a property that can be patented and owned, apart from a major source of personal identity. Although there was some debate on the scope of the exceptionality of genetic information (Murray, 1997, Etxeberria & Garcia-Azkonobieta 2004), it originated from the belief that DNA, and the information that might be derived from it, have unique features which will raise ethical, legal and social issues different from those raised by the processing of other biological materials.

The common image appears reflected in many official declarations and documents. For instance, the Universal Declaration on the Human Genome and Human Rights, adopted on 11 November 1997, states that the human genome "underlies the fundamental unity of all members of the human family, as well as the recognition of their inherent dignity and diversity. In a symbolic sense, it is

the heritage of humanity." (art. 1). Likewise, in its report on *Genomics and world health*, the World Health Organization warns that:

In genomics research and its medical application, familiar ethical issues such as informed consent, confidentiality, and avoiding discrimination and stigmatization take on different forms because of both the nature of genetic information and the specific social and economic contexts of individual countries. (WHO, 2002, 7)

After the completion of the Human Genome Project, there has been a shift in the current "genetization" of the scientific and medical culture. In a few years there has been a move from the term "genetics" (pertaining to genes) to that of "genomics" (pertaining to genomes) and other words ending in -omics, such as "proteomics", and more recently the rise of others such as "systems biology" (O'Malley et al., 2007). This term is not new, of course (as it has precedents in the 20th century biology of von Bertalanffy, Needham, etc.), but the systemic turn in molecular biology implies a substantial change in the way we think about the genome, by giving up the idea that it contains information in a static and isolated fashion, in concrete sequences ("genes") directly related to the different phonotypical traits. The metaphor of the genome as the "book" or "language" of life gives way to a different view of the role of the genome within the organism. This emphasizes the complexity of organic processes, which cannot be reduced to the properties of its parts or molecules. This is an important change in the way biology is conceived. As O'Malley and collaborators put it,

Systems biology will change biology into a more quantified and predictive activity while simultaneously overcoming the reductionism often practiced in genomics. (O'Malley et al., 2007, 68)

Thus, the systemic approach to biology tempers the more radical determinist positions in the late 20th century genetics. According to it, no single component (internal, like genes and other metabolic components, nor environmental, like food, education or pollution) is in general determining the construction of the organism and the preservation of life. Organic properties do no depend on the properties of isolated parts or static sequences; they rather emerge from the complex interaction of many components, both in the molecular and in the higher levels. This change can be described as a shift from a static, genocentric viewpoint, to a more dynamic one. As a result, the way ethical problems are construed changes (O'Malley et al., 2007, 70). For instance, the genocentric view sees DNA as a determinant of health: because it is biologically exceptional, it should be regulated by special norm, whereas after the systemic turn, health and disease are seen as the result of complex interactions between many genes, other molecules, and environmental factors. This way, an ethical problem such as the possible discrimination by insurance companies or employers on the basis of genetic tests should disappear, simply because those practices are based in

bad science: genetic tests actually say very little about the organic mechanisms and processes that we call health and disease. In the context of multilevel biological insight, genetic "exceptionalism" is a fallacy.

Other cases in which this epistemological reinterpretation might be of use include (1) the difficulties in accepting genetic modification of organisms, which are often based in the idea that the integrity of life depends on the genome; (2) problems related to patents and property issues related to the genome; and (3) the belief that identity depends upon DNA, or (to say it in the words used by the UNESCO) that the genome is the warrant of the "unity" of humanity, its intrinsic "dignity" and its symbolic "heritage". While in the static, genocentric view, DNA is a marker of ancestry or racial identity, in the dynamic reinterpretation it is only one part amongst many other components of our biological setup.

In other words, many ethical problems could simply be the result of a misguided epistemology. Adopting a view more in tune with systems biology changes many nuances when deliberating about issues having to do with the organic processes of living beings. It could be said that until now the debate has been biased or distorted by an outdated conception of biology; therefore, the ethical, legal and social issues of genomics should be reframed according to the present state of biological insight. This is why some authors are already proposing the development of a systems bioethics or even socio-ethics (O'Malley et al., 2007; Robert et al., 2006).

In the following section we will briefly summarize some of the consequences that this shift could have in our particular field of inquiry—the ethical problems with biobanks.

What a systemic approach to bioethics might change in biobanking

O'Malley and collaborators (2007, 73) point out that systems biology challenges some presuppositions about how the implications of scientific developments should be studied and criticized, suggesting that ethical analysis must work hand in hand with a social contextualization if we want to understand those developments in its actual complexity. We believe that adopting this kind of approach would entail some subtle changes in the discussion of the ethical and legal aspects of biobanks. For reasons of space, our discussion will be limited to apply to general purpose biobanks the basics of the proposal by O'Malley and collaborators, in order to make a few considerations about the implementation and use of these important research tools.

1. The main boethical problem originates if biological samples are collected without a genuine informed consent, as described by the Helsinki Declaration.

2. The genocentric, exceptionalist interpretation sees this as a threat, because an individual's genome potentially includes his "future diary" and "family secrets". Therefore, his or her privacy is considered to be directly threatened by any sample stored in a biobank.

3. The dynamic reinterpretation challenges this view by stating that DNA cannot say much about the health of an individual, because it is the result of multilevel interactions and emergent properties not directly dependent upon isolated sequences (although the analysis of DNA can reveal familial relationships).

4. This reinterpretation entails some interesting consequences for a socio-ethical approach to biobanking:

a) The first population genomics biobanks, such as the Icelndic one, were set up with the hope of using them as a tool to solve many health-related problems, by means of "gene-hunting" databases which would track the specific genetic sequences behind a given disease. The systems biology approach, seeing organic processes as more complex and with many other factors involved, will not deny the usefulness of sequence studies, but most certainly will reduce some of the expectations put into them.

b) The usefulness of general purpose biobanks is highly compromised if they are not linked with other databases including personal and medical information about the donors.

c) Legal regulation of biobanks (such as the recent Spanish Law on Biomedical Research, *Ley de Investigación Biomédica*) is focused on the rightful conditions for access to the samples stored, but says much less about the conditions of accessibility of other data that in time might be crucial for the research.

d) As a result, it might be the case that biobanks will only be successful in the close future in so far as they collect samples belonging to donors who suffer the same disease (that is, specific purpose biobanks). Another possibility is that general purpose biobanks include huge sources of additional information about the donors, such as their clinical history, lifestyle choices, etc., but then privacy issues would surely arise, not because of the biological sample, but because those related data.

Conclusion

In this article we have applied a current "paradigm shift" in biology, in which reductionist and determinist positions in genetics are generally replaced by a more systemic view, to an ethical inquiry with respect to biobanks and the way research is to take place through them. We have considered to what extent ethical concerns based on an outdated exceptionalist view of genetic information is damaging our understanding of what is at stake in research using biobanks. After all, genetic exceptionalism was adopted by both the defenders of research (the ones who made popular the image of the genome as "the book of life") and its critics. For instance, the criticism by Habermas (2001) is based on arguments which rely upon a reductionist and determinist vision of genetics (see also Umerez 2006). Systems biology, and its rejection of genetic exceptionalism, reduces to some degree fears about possible threats to privacy in relation to the use of biological samples in genetic research: although DNA can confirm identity or family relations, (which are important aspects for police and forensic research), what we call "health" and "disease" are complex conditions that cannot simply be deduced or predicted from a molecular sequence. A new approach, that of systems bioethics or socioethics, could help us channel the debate where the real threats might lie: that is, in the obvious need for researchers to access to additional information about the samples and their donors, and the necessary supervision so that the confidentiality and integrity of this information can be respected.

Biobanks challenge the traditional rules in the ethics of research because of its open (future uses of sample/data) nature. There is a big gap between theory and practice, as most documents and declarations at the global level insist on the need of genuine informed consent, but this requirement faces serious problems of implementation. Thus the demands of research are bringing about new "open consent" models, which are making their way into legislation, as in the new Spanish Law on Biomedical Research. (According to this particular piece of legislation, existing samples may be reused for biomedical research when the process of granting consent entails an "unreasonable effort"—a disproportionate amount of time, work or other expenses.)

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The Quest for Absolute Health: Biomedicine as a Janus Bifrons

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Abstract:

In most developed countries, the 'obsession of the absolute health' became a prevalent pathogenic factor. Iatrogenic diseases represent today the deleterious effects of the therapy which causes pathology independent of the condition for which the intervention was performed. A close reading of medical peer-review journals, and government health statistics, shows that in the Western World medicine frequently causes more harm than good. The medicine advance promises to eliminate all diseases, extending life span to infinity maintaining the freshness of youth: in fact, biotechnology is transforming pain into a technical problem, depriving suffering of its intrinsic personal meaning. Political economy considers pain a failure of the socio-economic system, and the patient himself perceives it as a lack of technique. Such a war against suffering is likely to destroy the individual's resistance to pain, and the normal individual becomes unable to accept suffering and death as components of reality.

Keywords: *Health, Biomedicine, progress, iatrogenesis, Janus Bifrons*

Introduction

Modern medicine today seems to have neglected its rich historical and humanistic tradition in order to follow the expensive and profitable progress of the biotechnological business, where those researchers not wishing to lose their power – and funds – make promises they cannot keep. In this paper, we would like to introduce biomedicine under the appearance of the mythical personage of Janus Bifrons, following the metaphor of Ivan Illich (Illich, 1999). Janus is one of the oldest Roman gods, and does not have a correspondent in Greece. There were several temples to Janus in Rome, the most famous was the one in the Forum Romanum, whose gates would be open in time of war, and only closed in times of peace. Several myths exist about his origin: the first month of the year was dedicated to Janus, and called January: Its festival was celebrated on January 1st. Janus was often depicted with two faces, and was then called Janus Bifrons. It was the god of all beginnings and of passages such as doors, gates and bridges, where it could watch simultaneously the entrance and the exit: that's the reason why it has two faces.

So, now we are just looking at biomedicine as a Janus Bifrons: with one face, we look at the statistics about mortality and morbidity, the fall of which is interpreted as a result of medical performance; with the other face, we cannot avoid the anthropological surveys that give us the answer to the simple question: "how are you"? For, the greater are the care opportunities, the greater is the number of people who have problems, needs, diseases, and who require to be protected from any kind of risks. In most developed countries, the 'obsession of the absolute health' became a prevalent pathogenic factor: in a world prostrated at the feet of the instrumental ideal of technological science, the medical system creates every day new pharmaceuticals and care needs. Everybody claims that progress must eliminate all diseases, extending life span to infinity maintaining the freshness of youth: no more ageing, no more pain, no more death. Here I want to stress that such a contempt of the art of suffering is the denial of the same human condition: in fact, as Nietzsche said, being human is the real illness. Biomedicine is transforming pain into a technical problem – say an economic problem – depriving suffering of its intrinsic personal meaning.

2. When we consider medicine from the historical point of view, namely medicine in the Western world, we must go back to Bologna, Italy: it was there that the University stemmed from the "Schools of the Liberal Arts", which flourished at Bologna early in the eleventh century, and where the *ars medendi et curandi* was born. It was there at first, that the discipline dealing with pain, anguish and death has been re-integrated into the domain of wisdom. So, the fragmentation of science was overcome: such a fragmentation was never present in the Islamic world, where the Hakim title[1] indicates the medical doctor and at the same time a scientist, a philosopher and a healer. But conferring to medical knowledge the university autonomy, including the auto-critics of its own

[1] al-Ḥakīm "the Wise" is one of the 99 names of Allah.

practice, Bologna sowed seeds of a highly ambiguous social enterprise, an institution that progressively made invisible the limits within which choosing to face suffering is considered a better choice than eliminating it (with euthanasia), as much as welcoming death instead of rejecting it with therapeutic fury (Illich, 1999). Of course, the Prometheus temptation fascinated medicine very early: but in the past, the medical doctor learned how to recognize the "Hippocratic face", the signs indicating that he was not in the presence of a patient, but of a dying person. Now, even ageing – and maybe later, death itself – is being consider simply a disease, as the Harvard University Gazette quoted on 28th August 2001, when researchers at Harvard-affiliated Beth Israel Deaconess Medical Center, Children's Hospital, and other institutions, have pinpointed a region on human chromosome 4 that is likely to contain a gene or genes associated with extraordinary life expectancy. This is the first study to use humans to try to find genes that play a role in life span. Many investigators thought longevity is far more complex a trait that wouldn't be influenced by just a few genes. According to Louis M. Kunkel, chief of genetics at Children's Hospital, whose lab performed the genomewide scans on 137 sets of two or more exceptionally long-lived siblings in the study, we have known that only a few genes influence longevity in lower organisms and that now it appears to be true in humans. Having found the region in which this gene or genes lie, the group intends to identify the exact gene or genes responsible for longevity. Scientists have long wondered what enabled centenarians to maintain good health for so long: the study's authors hypothesize that centenarians have a history of aging very slowly and either markedly delay age-related diseases – such as cardiovascular disease, stroke, diabetes, cancer, and Alzheimer's disease – or avoid them altogether. Once those genes are uncovered, scientists would like to understand the biochemical pathways the gene or genes affect to promote longevity. The authors speculate that such insight could lead to the development of drugs that mimic what centenarians possess genetically to escape the adverse consequences of aging. In other words, while in the past the medical doctor's realism subordinated the technique to the art of suffering and dying, medicine today would treat even ageing as a disease. Around 161 BC in the comedy *Phormio*, by Terence, an old man is asked by his brother what illness afflicts him replies: "*Why do you ask? The illness is old age itself.*" In 1732, the doctoral thesis of Jacob Hutter was entitled "*Senescence itself is an illness*". The incurable nature of the illness was commented on by Seneca: *senectus enim insanabilis morbus est* (Schäfer ,2002). Twentieth century optimism led to a marked change in attitude towards the issue of incurability in spite of the old and modern axioms, yet French sociologist and philosopher Emile Durkheim (1858-1917) wondered: if ageing itself is a disease, how can we distinguish the sick elderly from the healthy one? In fact, modern biomedicine got the habit of creating daily new needs in a world more and more imbued by the instrumental power of science and technology: an increasing quest for absolute health became a sort of social liturgy serving an idol – biotechnology – which, in change, turns off the subject. On the other side, the longitudinal projects on ageing are quite neglected so far,

in spite of their immense research potential from the social, cultural, and ethical point of view (Ballesteros, R.F.,., Zamarron, M.D., Rudinger, G, Schroots, J.J.F., Heikkinen, E. Drusini, A. Paul, C. Charzewska, J. Rosenmayr, L., 2004). The reductionism in Biomedicine today is a technical, cultural, and social paradox (Drusini, 2005).

3. From the technical point of view, synergic therapies created new diseases and iatrogenesis. From the social point of view, the uprooting of diagnostics harass the patient, the elderly, and even those passing away. From the cultural point of view, finally, progress promises lead to refuse the human condition and disdain the art of suffering. Medical doctors have lost control of the biological condition and biocracy: it's the industrial system today who claims the right to manage well-being. Corrupted by the financial system, biomedicine assists impassibly to the transition from the physical body to the "fiscal body". In fact, neither can we elude the contrast between the claimed "objective health" and the "subjective health" anymore, nor can we avoid considering illness as a transition from the 'physical' to the 'fiscal' body, with the financial parameters being a metaphor for the different diseases of a unique body. Modern biomedicine's first need is to make general the individual responses to disease. How biomedicine can afford this goal is quite clear: a new fetish rose from the ashes of medical ethics, a quite particular fetish: the human life. Thus, biomedicine ceased to look at the suffering of a sick person: the object of its care became something called "a human life". To transform a person in a life is a very lethal operation, and a very dangerous transaction: but ethics, institutions, universities, programs and courses created a perspective where life is presented as an item which is now subject to the medical, professional and financial management. Life as an "entity" – "Life on Earth", "The Planet's Life" – is always presented as something precious, scarce, menaced, and as something which needs more and more scientists, specialists, therapists, and research. Nobody can stand against this new fetish, a socio-cultural construction, so taken for granted that nobody might question it at all. The concept of 'life' – as anything special and precious – reminds us of the concept of 'value', and the latter deviated through the concept of 'possession'. 'Possession of life' indeed become the supreme value, and the *Homo oeconomicus* become the ethics subject. For years and years, "to preserve life" has become the principal reason of human action and social organization. In today's world – when "to have" is more important than "to be" – "to be alive" and "to have a life" bear different meanings. This ambiguous fetish, emerging from the scientific speech, runs the risk of overshadowing the (legal!) concept of 'person'. In the past, the fetus formation in uterus – the renewal of life – and the "Hippocratic face" – the coming near of death – were the two moments in which the healer left to take care of the patient. Today, medical doctors learn to be 'responsible of life' from the moment of the artificial insemination to the moment of the withdrawing of the organs for a transplant. So, the medical doctor somehow is responsible in the place of the patient: having the possibility to distinguish between a human life and a human being, or between a human being's life and a human being's non-life (i.e., the respiratory machine patient), the doctor becomes the social manager of a life, and no more the person

responsible for a human being. The position of such a doctor is perfectly tuning in with the health economy requirements.

4. In the historical perspective, diagnosis had a therapeutic value. The meeting between the doctor and the patient was essentially verbal, and the medical examination was a conversation. The patient was still able to describe its troubles – a lack of balance of its own humors, an alteration of its flows, a confusion of its senses. A journal of a baroque age doctor sounds like a Greek tragedy. So, in the past, the medical art was "the art of listening", until auscultation replaced it in modern times. Especially after the year 1945, the patient is invited to see its own blood examination results, X-rays, tomographies, magnetic resonance images, ecography waves: and here's the era of 'diagnostic imaging', where, together with the doctor, the patient looks at its own *imago*. Thanks to this kind of auto-view, the patient stops listening to himself, as a disembodiment of the ego. The diagnostic imaging, like other instrumental medical analyses, are no more that an abstraction of the medical ritual, made of curves of probability and not of real symptoms. Face to that stuff, even if the data do not represent the individual so far, but the arithmetic mean of a certain population sample, the doctor demands the patient to make its plans carefully. So, to decide what kind of services are needed, the patient is forced to gamble its own life. In their book *Dangerous diagnostics. The Social Power of Biological Information*, Dorothy Nelkin and Laurence Tancredi (1994) showed how an increasing number of people can be marginalized, excluded, or stigmatised as a result of predictions based on biological tests. The authors also explore how the new diagnostics are becoming a means for organisations to extend their control to the personal life of their clients, and to their future possibilities. They deal especially with the use of tests to predict disease in asymptomatic persons when the meaning of test results is uncertain, for example in some pre-employment examinations. Social constructs can be important in defining physical disease. In most primitive populations, some pathological conditions are so diffused that people do not consider them disease at all. In some areas of Africa, the sickle-cell trait is a 'normal' adaptive reaction to malaria, while in Europe it is viewed as evidence of a disease (Baker, 1989). The Nelkin and Tancredi purpose is to demystify the new diagnostic technologies by revealing the organisational pressures and preconceived values shaping their applications, and by opening debate on their social implications. Over 180 foetal disorders can be detected through foetal screening techniques, which can identify genetic anomalies in the placenta when women are only eight to ten weeks pregnant. Among others, some conditions are very dangerous, as Tay-Sachs disease, Down's syndrome, Duchenne muscular dystrophy, cleft palates, and so on. Based on current indications for amniocentesis, less than 5 percent of detected foetal anomalies are considered serious enough to warrant consideration of abortion. Prenatal testing is now a routine part of obstetric services for women over thirty-five

years of age. In the case of serious and devastating conditions, prediction through prenatal tests is clearly useful: but in some cases, demands for genetic counselling can reflect the desire to control reproduction in a questionable way. Some critics claim that new technologies have created new standards of perfection, who remind us the previous eugenics enterprise ("*to fall in love intelligently*").

As the American anthropologist Jonathan Marks stated (Marks, 2002), Madison Grant was a well educated New York lawyer with a broad moustache and an obsession with biology: his 1916 book, *The Passing of the Great Race* is a classic of American popular social thought. Grant analysed the social problems the U.S. were facing in a generation of immigrants and urban slums, concluding that these problems were basically genetic in nature. Too many constitutionally inferior people were coming in and having too many babies, which could only lead to the genetic infirmity of the nation. The genetic health of the nation was predicated on the excellent gene pool – or germ plasm – of north-west Europeans. The problem was that south-eastern Europeans were now immigrating in large numbers, posing a genetic threat. Drastic measures were obviously called for. To Grant, the problem was biological, and the solution too: sterilization for criminals and worthless race types. The Eugenics Society was interesting so much for its message: it was scientific, it was technological, it was modern. In fact, the first critiques by biologists of the eugenics movement would not come until nearly a decade later. In Russia, Manoilov and his assistants refined a test that essentialized not only sex, but sexual preference as well. A Doctor Livshits analyzed bloods of "homosexualists", some women "suffering from Lesbian love", and various others. The lesbians came out male, for instance. Nevertheless, The Human Genome Project has two interesting similarities to the eugenics movement in the 1920s. First, sequencing the genome is going to cure all types of cancer, when in fact the DNA sequence can't even cure sickle-cell anaemia, which we've had the sequence of for years. Second, the Platonism inherent in the eugenics movement – 'degeneration from an ideal form' – is resurrected in the Human Genome Project. In a purely medical context, it may often be appropriate to think of a 'normal' coding sequence of a gene, and 'degenerate' mutations leading to diseases. Thus, the cystic fibrosis gene, whose normal function of course has nothing to do with cystic fibrosis – that's just what happens when the gene breaks down – can be considered as a normal coding sequence with pathological variants. Summed over the entire genome, you get the normal genotype – without considering complications like diploidy or heterozygosity. It's a simple extrapolation of the Platonic folk wisdom that seems to work today in some medical genetic contexts. The point is that we don't have no idea of where the genes for normal phenotypes are. Take for example the genes for noses: we don't know what they do, what their variation is like, we don't even know how to find them. It isn't that there is one kind of normal nose and a whole of different mutant diseased noses – Marks stated – but a whole of different normal noses. Now that's the same for a hard, inherited trait. The problem with genes for behaviours is not just "*do they exist* ?" but "*how will they be interpreted*?" if they do exist. Do a 'monogamy

gene' exist (Lim et al., 2004)? The Marks opinion is that if you can't do genetics without stigmatising people, you shouldn't be doing it. Genetics tends to be oriented towards technological questions and technological competence – but the question "Can you conceive, design, execute, and publish this research so that no one gets hurt or stigmatised?" should be at least as important a question: and that would necessitate a somewhat different approach to the scientific training of geneticists.

And now I wonder what is concerned with injecting a new "consciousness of risk" into European women and men, for this is not a natural phenomenon. I am convinced that health and responsibility belong to a lost past: responsibility is now an illusion. In our world, being healthy is reduced to a combination of the enjoyment of techniques, protection of the environment, star wars and quest for immortality. Adaptation to the misanthropic genetic, chemical and socio-cultural consequences of growth is now described as *health*. Neither the Galenic-Hippocratic representations of a humoral balance, nor the Enlightenment utopia of a right to 'health and happiness' have anything to do with survival in a technical biomedical system. The pedigree analysis is followed by a capsule introduction to medical statistics and general genetics. You learn, for example, that childbearing is always a risk: 3 to 5 % of all newborns have a congenital defect. This is the "base risk" assigned to every pregnant woman. It resulted from the transfer of general statistical frequencies to individuals now conceptualized as subject to personal risk. The statistical observation, that on average one out of 200 newborns have a heart defect has become the individual risk of 0,5% for every pregnant woman to bear a child with a heart defect. Thinking in this way, one also runs a risk in using a bathroom. There is a 5% chance of a slip on the smooth tiled floor, resulting in a severe or even lethal injury (Samerski, 2001).

5. In his work Prometheus, Aeschylus describes the two gifts the Titan gave to mankind: the oblivion of the hour of death – thanks to Hope, which cannot see, acting as a medicine – and fire, which represents technique, the « savoir faire » enabling man to survive and to become the lord of the world. But technique and its progress are today based on the oblivion of death, related to the dream of immortality. Technique has made man free and has become his own world and essence. However, if by the term « technique » we mean "rationality", with man the actor and technique the instrument and means, then this concerns the past, whereas if we are thinking of technique as a domain or rather as a domination, this concerns the present: as Bacon said, scientia est potentia. Technique is based on the repression of death and the dream of immortality, we said. As far as modern biotechnology is concerned, such a repression is even more problematic: the impossibility for medical science to eliminate the problem of death, and at the same time the technical effort required for facing it, represents one of the

paradoxes of modern biomedicine. The identity crisis of the doctor facing a terminal patient, abortion, or death penalty, the ethical problem of therapeutic fury, or the case of a patient rejecting therapy, are witness to this paradox: any ethical problem is becoming a technical problem. Aristotle said that a physician is a scientist, and that medicine is a typical example of how an empirical knowledge can be transformed in an authentic science. The scientific knowledge of the doctor becomes thus universal in that technique was born from science and knowledge, being therefore deeply in debt to them. This we must bear in mind especially today, diagnosis often being no longer the result of the physician's intervention, but rather a tangle of analysis and instrumental readings indicating nothing more than a curve of probability. There, in the computerised laboratory of body repair, both patient and doctor have lost their role. Hans Magnus Enzensberger said that if in the past shamans and faith healers took care of fighting disease, in the present they have been replaced by molecular biologists. As a matter of fact, today the researchers, and not the priests, talk about immortality. In this view, what was before regarded as an error of medical knowledge, can nowadays be rationalized as an accidental mistake of technique, of the equipment, of the operator; similarly, indifference has been turned into «scientific detachment», and incompetence into «lack of sophisticated technologies». Biotechnology is transforming pain into a technical problem, depriving suffering of its intrinsic personal meaning. Political economy considers pain a failure of the socio-economic system, and the patient himself perceives it as a lack of technique. Such a war against suffering is likely to destroy the individual's resistance to pain, and the normal individual becomes unable to accept suffering and death as components of reality. In his work The Question Concerning Technology , Martin Heid egger (1977) wrote that we are bound to technique and deprived of freedom, do we passionately assert or apparently deny it. Such a sanitised vision of health, though, is but the reflection of a vaster mechanist and scientistic vision, identifying the ideal condition with optimal functioning, that is with the efficiency and effectiveness of the functions. In his book La souris, la mouche et l'homme' (1997), François Jacob points out how research is based on uncertainty. Another paradox, after decades of positivist certainty in the objective data of experimentation, breaks into the restless scientific world: research is not fortuitous, but it is unforeseeable. From another point of view, despite the many scholars claiming that health is not only resistance to pain, there is a strong tendency to simplify the conception of health, degrading it to a pain-free condition. Such a trend, though, hinders the understanding of the fact that health is not a condition at all, but rather a movable place that anybody can find in experiencing his own disease and pain. Pain has a meaning, a mismeasure, a pace, for pain is mother to life; such a mismeasure reminds us of Plato's distinction, where « métron » is the measure we get approaching the object from the outside, and « métrion » represents what is « suitable », fitting, with regards to the inner status of any living being. This «inner mismeasure» - pain, illness, malaise – which can in fact be usefully compared with scientific parameters, but never identified with them, is undoubtedly the mismeasure of any personal pathology, but it is also the one

and only place of its life, and therefore, it being unknown, it would be impossible to find a way to health.

Conclusion

Technology has nowadays gained an hegemonic position, profiting both from determinant resources and general attention (technology will be the basis of the next economic cycle), while other disciplines such as anthropology, history of medicine or philosophy are left with a marginal role: they are taken into account and tolerated, but just given the inoffensive character allotted to them by state and economy. Friederich Nietzsche (1986) could well assert, that the inventors of new values are born far from markets and from glory, and Guido Ceronetti (1979) that science made hearts beat longer, but disheartens: let us pay it, but without thanking. When worshipped, science and technology become ideologies: since they are above any research and project, thus they neutralize the subject and devalue the individual.

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PART III

ENVIRONMENTAL ETHICS

- Bioethics, a Global Concern
- Environment, Sustainability & Social Justice
- Democracy & Environmental Issues
- Nanotechnologies, Environment & Human Nature
- Culture, Nature, & Global Concern for the Natural Environment
- Recommendations to Improve the Environmental Security
- Animal Ethics and Process Thought
- Global Bioethics and Human Ecology

Bioethics, a Global Concern

Introduction by Saloña-Bordas, M. I.*, with chapter summaries by J. M. de Cózar-Escalante, J. Deckers*** & T. Heyd *****

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The term Bioethics was firstly proposed in 1970 by Van Rensselaer Potter (South Dakota, 1911 – Wisconsin, 2001), a North American oncologist who called for "*a new concept that* [would] *provide a guide for action.…"* He suggested that "*the knowledge about how to use the knowledge for the social good- might be called Science of Survival, surely the prerequisite to improvement in the quality of life."* (Potter, 1971). He opened the 1st World Conference on Bioethics claiming that "*This century will be the century of Bioethics or will be the century of chaos*" (Potter, Gijón-Spain, 2000). We had transformed modernity since the last century and we were entering a new Millennium. It was time to reflect and to plan a new future: "*New time, New dimensions*".

A few years before, a compatriot of Potter named Aldo Leopold (Iowa, 1887-1948) wrote a kind of diary that transformed the conscience of many citizens, giving birth to a new view of the interactions between nonhuman nature and human beings. Subsequently, modern historians and encyclopaedias have traced the origin of the concept 'e*nvironmental ethics'* to his reflections. In his diary entitled "*A Sand County Almanac*", Leopold reflected on our interactions with the environment, raising concerns over how industrial and agricultural development was contributing to the loss of emblematic species in his country. He also called for "*land ethic*", that is, an "*ethics of the earth*" or new philosophy of the natural environment.

Going backwards through our recent history we take note that in XIXth century Europe a movement, known as *Naturphilosophie* had come about, which cherished this idea of an '*ethics of the earth'* already. Its origins can be connected to the most ancient cultures of the world, ranging from Amazonia to India, from Alaska to the Australian Aborigines. We know that the return to Nature advocated by the *Naturphilosophie* School is reminiscent of the natural philosophy of the indigenous people inhabiting the American continent before the massive arrival of Europeans to their continent. The declaration made by the Squamish leader - known as "Chief Seattle"[1] clearly summarises these principles: "*Earth does not belong to Man, Man belongs to Earth*" (Chief Seattle letter to USA President). While this idea is as old as our own existence, many years of technical education have made us forget it, unfortunately leading to a severe loss of integrity of Nature. Interestingly, indigenous cultures are reaffirming their beliefs and are presently demanding that developed countries reconsider their developmental model and value system (consider, for example, their contributions to the Rio-1992 Conference and to *Agenda 21*).

The *Naturphilosophie* School gave rise to the emergence of a new scientific discipline at the end of the XIXth century that that made reference in its name to the idea of *Oikos*, the House: Oiko-logy (="knowledge of the *Oikos*, the house where all the organisms live"), presently called Ecology. Those who defend the integrity of ecosystems, as described by ecologists, aim to find the balance between human development and the environment, and tend to have a holistic view of humans. This is also captured by the concept of "Sustainable Development", the topic in vogue at many recent meetings as well as in political and scientific programs.

Years of research have demonstrated that it may be useless to develop a list of threatened species in order to preserve them. Over and over again, the process of establishing such lists has contributed to an increase in the number of emblematic species, threatened simply because of our interaction with them. Contemporary wildlife managers believe, rather, that the adequate preservation of habitats should be a priority in the preservation of a threatened species. We may ask: How can any animal species be understood in isolation from its natural environment? A lack of balance will likely show up in disease illness and symptoms of increased stress. A sad example of a lack of adequate management can be found in one of the last extinctions that occurred in Spain during the last century, the disappearance of the wild goat known as "*bucardo*" (*cf.* Geocities, 2000). This species was extinguished from the Pyrenees due to an concatenation of mistakes in the decisions taken for its preservation. After the death of the last female, a sample of blood was preserved for potential cloning of the species. Is a single female able to "resurrect" any extinguished species? Obviously not. Was

[1] Irrespective of the exact wording of what Chief Seattle may have said (*cf.* Clark 1985), this is a statement that we would do well to keep in mind at our present time.

the key to the extinction of this species based on the species' survival problems due to encroachment of its niche, or was it simply due to bad management of the last remaining individuals? For this species, it is known that the decision to change the habitat conditions and move the last individuals to a protected but inadequate area accelerated the disappearance of the last survivors. Ceballos and Ehrlich argue that "*population extinctions today seem to be concentrated either where there are high human population densities, or where other human impacts, such as intensive agriculture, grazing, and hunting, have been severe."* (Ceballos & Ehrlich, 2002)

It seems evident that as long as we do not change our model of development, no technology will defend us against our mistakes. In the same way the integrity of a person can only be supported in a healthy and balanced environment. Any well-trained clinician knows about the importance of a balanced environment in the management of an illness. Our attempts to undermine nature will always act against us, although the symptoms may not be detected within our short time-scales. It may take years to show, but at the end our own bodies will manifest symptoms of the Earth's illness, the unbalanced management of Gaia, Nature, or Mother Earth (whatever we call her).

When in the XXIst century no real agreement seems possible at a planetary scale on issues as basic as the need to reduce our emissions of greenhouse gases, or the need to protect civil populations against military attacks, when we know for sure how these issues are influencing our climate and our health and safety, it is clear that, as humans, we have not developed much during the last century, at least not at the same speed as our technologies have done. We have actually been ignoring the knowledge and experience acquired by our ancestors, taking on a childish attitude. In our technology-dependent culture this ignorance is increasing at a speed that is out of our control. Insofar as we are ignorant of the nature of the technological devices that our society has created, we tend to trust in that same technology to solve our problems (*cf.* de Cózar-Escalante, 2006). However, technologies never act by themselves. Their good or bad application depends on the use we make of it.

We need an urgent revision of our value systems. We cannot afford to wait. Future generations may lack the ability to solve the issues that we have refused to face up to. Unlike most or all nonhuman animals, we are able to face up to our responsibilities (Saloña- Bordas, 2004), and *"it's time to act."* (Wangari Maathai, Bilbao 2006). In 5 chapters dealing with diverse topics related to animal and environmental ethics, the contributors to this section take up this challenge, echoing the call for a global view of bioethics issued in Potter's last reflections, published shortly before his death (*cf.* Potter, 1988).

Jan Deckers develops animal ethics inspired by Alfred Whitehead's process philosophy. Process thought or the philosophy of organism poses a radical

challenge to the main ontologies which have dominated Western philosophy: classical materialism and dualism. In classical materialism, matter is understood to be inert, devoid of creativity, and lifeless. Dualism shares this understanding of reality with classical materialism, yet allows for one exception: the realm of the mind. While both classical materialism and dualism can be criticised for failing to provide an adequate understanding of reality, they have also been used to justify unacceptable ways of treating animals. The alternative of panexperientialism provides not only a better way to understand reality, but can also inspire the development of an animal ethic that harmonises many people's feelings about the treatment of nonhuman animals with appropriate justifications.

A new animal ethics is proposed and distinguished from previous work carried out by process thinkers in this field, particularly through a discussion of vegetarianism. Deckers argues that, if a morally relevant distinction between plants and animals can be made, most people in developed countries would be morally obliged to choose vegan diets.

Thomas Heyd reflects about the point of preserving nature in parks and natural heritage sites. It has recently been argued that such undertakings make no sense because any interventions to protect nature inevitably turn it into an artefact. This type of objection gains in strength when we become aware of the degree of management and continuous restoration that such areas require in order to maintain the diversity of species and landscapes for which those spaces are protected. Thomas Heyd addresses these issues in his paper, while offering a fresh perspective on the relation of culture, nature, and global concern for the integrity of the natural environment.

While acknowledging the common assumption that nature and culture are often perceived as opposed, he supports the view that this contrast is misplaced. This analysis provides him with the leverage to argue for what he calls "a culture of nature," by which he means a culture that seeks to support the actualization of the potentials present in the natural world. Heyd's proposal starts from an attempt to understand the notion of cultural landscapes, as introduced into the World Heritage Convention in the 1990s. One of the virtues of his account of the relation of nature and culture is that it leads to insights on how people may find an appropriate place in the natural spaces that surround them, and these insights may in turn be useful for a rethinking about the management of natural heritage sites and cultural landscapes. Ultimately Heyd concludes that management and restoration of natural areas are not necessarily at odds with the objective of preserving nature once the relation between nature and culture is properly understood.

Saloña Bordas connects environmental management with social justice, showing that there is a direct connection between how the environment and how modern

societies are managed. Focused on the model of the forest as a balanced system, the author demonstrates how energy fluxes in deforested areas are clearly connected with poor/rich areas, and with the unbalanced distribution of both energy and wealth between corporate producers and consumers. In the chapter, the importance of a culture of the forest for sustainable development and for the safety of people all over the world is shown. The need for an urgent revision of our standards is demanded, as well as the need for a more responsible attitude towards nature and other human beings.

Janos Toth focuses his arguments on the main problem of our modern societies, industrial pollution. This problem is of special importance in eastern Europe, where the author comes from and it is increasing dangerously in underdeveloped countries, where the most polluting technologies are moved to due to a lack of clear environmental policies in those countries. After years of political repression, citizens show a lack of respect for, and knowledge of the law, as well as a lack of environmental awareness, a situation which aggravates the tragic levels of this important problem. The effective potential of technology is increasing remarkably and is affecting people who live far away in space (in other countries) as well as in time (the next generations). Because of this reason society has to pay more and more attention to these negative effects, which exist through non-market mediation.

By focusing on the example of cyanide pollution, Toth shows us how the lack of environmental policies and environmental education of our societies may condemn future generations to live with our reservoirs of unsafe water. Toth develops interesting solutions focused on insurance systems to protect citizens from environmental disasters produced by industries financed by creditor banks that usually are compensated before the victims are.

José Manuel de Cózar points out how nanotechnologies are portrayed as being able to solve all our problems. In his chapter, the author discusses the most significant risks that developments in nanotechnology will pose for society and the environment from a bioethical point of view. The author shows us how there is no such thing as 'nanotechnology', but rather an endless number of possible nanotechnologies and ways to use it.

Several examples are provided in the chapter, showing how a number of nanotechnological projects will be carried out because of the values that support them. However, these projects might also display a range of conflicting values: endless change or self-restraint, individual gain or collective benefit, the search for immortality or acceptance of death, domination of nature or conviviality with her, recognition of the specificities of others or intolerance.

The examples of the knife (*cf.* Saloña Bordas) or the axe (*cf.* de Cózar) demonstrate that the problem is not in the technologies themselves, but in the

way we use them, whether we use them in responsible or in irresponsible ways. This is our option, and this is our opportunity. As de Cózar points out in his contribution: "*the future will come no matter what we do; but the success of the decisions that we take will depend on the responsibilities that we are willing to assume*".

At the beginning of the third millennium, new technologies may not be our last chance to solve our problems, but they challenge us to seek adequate information before we make decisions as producers as well as consumers and to assume the co-responsibility for our acts.

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Environment, Sustainability and Social Justice

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Abstract

A revision of the concept of Bioethics should be done demanding the consideration of Environmental Ethics as the main core that lodge any other aspect related to an "Ethics of Life" in it. Such demand was done by Van Rensselaer Potter, the person that first proposed the use of this term in his last revision of the concept. This claim is done in this contribution on the basis of our actual relationship with Nature and the unsustainable evolvement of the globalization process, done under the control of rich countries and transnational groups of power that manage the production and richness distribution of natural products, mainly proceeding from "underdeveloped" countries, where people are forced to abandon their lands and migrate to marginal activities in the suburbs of their main cities, or in our satisfied 1st world countries that accumulate and manage their richness at backwards of the basic human rights.

" Man has not inherited the Earth, he has only borrowed it from his children"
(Old Indian Proverb)

Keywords: *Human being, development, nature, sustainability, resources, anthropization.*

Introduction

Manipulation of the concept of Bioethics by specific groups more interested in focus it to problems that just worry developed sectors of our modern societies, may corrupt the primary idea developed by Potter in 1971. As "*A strategic ambiguity*" catalogued himself this tendency in his last revision of the concept Bioethics (Potter, 1988). Why have we arrived to a dichotomy between medical ethics, considered nearly synonym of Bioethics in occidental cultures, and Environmental Ethics? A denounce about the actual existence of an "ethics for the rich", based on secondary problems such as the right or not to be pregnant, deciding about the future of an embryo under developmental stage, the right to therapies that involve the destruction of embryonic cells, the right to decide when to die, etc., are more related to people that have their future sure enough to find time to discuss about minor questions than to those that only affect to people whose main worrisome is what will they eat tomorrow, or where will they sleep; if their children will return alive from school, or worst, when will they children have the chance to go to school instead of fighting and dying in wars supported and financed from our latitudes. When "*about 29,000 children under the age of five – 21 each minute– die every day, mainly from preventable causes"* (Unicef), mainly due to the bad quality of water and lack of access to not much expensive vaccines; our worrisome about abortion, euthanasia, stem cells, transgenics or *nanotechs* sounds quite offensive. In this chapter, I would like to analyse and focus this problem from a biological point of view.

Time to act

Wangari Maahtai (Nyeri, Kenya, 1940-) reacted on time. She founded *The Green Belt Movement* in 1977 to provide a future for other women in her country and sustainable forests for future generations. She has recently visited our country. It was a nice experience to share with her about the importance of the forests in the sustainable future of any culture. She won the Nobel Price of Peace in 2004 after her personal crusade against deforestation in her country. Now is your time.

Let us begin with a simple exercise. You may have done it previously; but I'm sure that this time, things will work different for you. Take your time to think about it properly. What would you take with you to a desert island? In this traditional game, you are only allowed to take 3 things with you. Take now a sheet of paper and face with the challenge of writing a text on a white sheet. You may need to draw up first your idea about a desert island. Draw an island with yourself; it's a good way to break down the white barrier of the paper. How do you consider that this desert island is? Take into account that it is really desert, absolutely deserted. You may have drawn a nice palm on your rock. There is no desert in such idea; at least not as desert as to consider that there is no sign of any living being. Now you are under the real situation, it means that there is

nothing else but a solid rock in the middle of a desert ocean. At least, if we have had a palm tree we have had shadow for the sunny days, protection against storms, and coconuts for drinking the juice and eating the pulp; luxurious!

Now is time to check yourself; what have you written down on your paper. What are those three things that you consider are really important in your life, as important as to make the effort to take them with you, or to be sure about its presence if you want to survive alone in the desert island. That's what you have at a global scale in your planet. Too much has been speculated about the potential existence of life in other planets, or at least about the potential existence of adequate conditions for it, a place where to look or refuge when no future will remain in our corrupted planet. Too much money has been spent on this peculiar crusade, when no funds can be found to prevent species extinction and to solve basic needs for more than 90% of world population. Nevertheless, the more we search "outside" the more conscience we should develop, as we are absolutely alone at one side of an immense desert of planets, stars and galaxies. We have no alternatives, no other place to go, really.

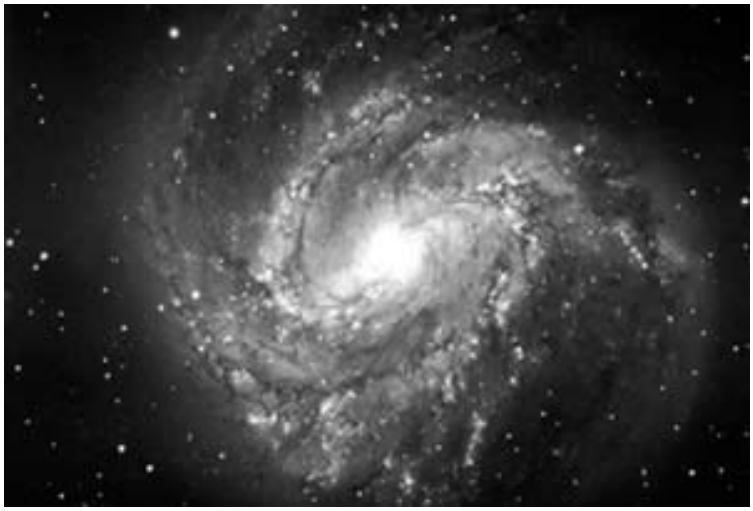


Fig.1. Via Lactea. In a small extreme of this system is our planet; no sign of external life has already been found during years of spatial explorations, no realistic alternatives to find an adequate place where to escape to our stupidity.

Planet Earth, a place for life

What are those adequate conditions for our survival and that of our future generations?

1st.- Water. Was it your first option? May be not but you are lucky today; you are allowed to you reconsider your decision after reading the last paragraph, and you can write again the 3 real priorities in your life. Take your time; what have you written this time? Water in capitals or just H_2O to minimize efforts, you lazy

reader? What do you consider for water? H_2O and nothing else but H_2O, that means, distillate water? You may die in few minutes if you drink just distillate water, take care about thinking that H_2O is much enough for your survival; that new technologies will allow you to "build" as much water as you will need in the future. You inhabit a living body that has been evolving on this planet for millions of years, more that 70% of your body is water as solute that sustains organic and inorganic elements in a balance solution. You first need ions in this solution –especially K and Ca to think better your next two options- and you are surrounded by hectolitres of salted sea water in your island; useless at all. You are going to be in the middle of an ocean, a desert ocean, in that "paradisiacal" island, with no competitors for your daily needs of water. But you may remember the film Waterworld; in a world surrounded by water, paradoxically, the main problem of survival for that society was the drinking water, a safe source of fresh water. In your evolutionary process you abandoned the primary element, the sea, millions of years ago as a reptilian ancestor and your body gets adapted to lower concentrations of salts in your body to survive on a world surrounded by fresh water. In the same way, all the vertebrates have osmotic problems in sea water. Furthermore, human body is not adequately adapted to preserve its own water and you will lost an important amount of water just to be alive, through sweating as well as through urine and faeces. Mammals in general and human beings in particular are bad regulators of the levels of water in their bodies. We need to consume about 2-3 litters of "water" every day drinking it liquid or eating it in the composition of our food, nothing else but other living beings that also have water in their composition. And we can not drink any kind of water. It's not enough with the chemical basis of the water, H_2O. In water you have something else, minerals in a balance solution that allows you to develop normally all your daily activities, including the effort of thinking about what to write down next on that white sheet of paper.

More than two thirds of the earth planet is covered by water but only the 1% of this water is available to be directly consumed to satisfy our daily needs; and we waste it, corrupt it unconscious. This water is mainly in temperate countries and underground. Temperate countries have shown an absolute lack of a '*culture of water'*. Water has been historically misused, corrupted, polluted and used as an arm against other people. Most of the historical confrontations within humanity had the control and management of the water as the basis of the conflict. Thousands of people die every year due to the lack of a basic human right, the access to safe water. The *Universal Declaration of Human Rights* express clearly in the article 3 that "*Everyone has the right to life, liberty and security of person*." (U.N., 1948) Water is the basis of the existence of life, a security problem; is the basis of our own existence, corrupting the water, kidnapping the control and the access of this basic need equals to corrupting and kidnapping the human right to life.

Nevertheless, water is not only used for direct consumption by humans. Water is basic for food production. We eat living beings, animals and non animals but living beings with similar or higher levels of water in their bodies. Therefore, water is basic for food production. One person needs more than 3000 litres of safe water *per* year to cover her/his basic needs of food following U.N. estimations (source: FAO & FIDA, 2006) ; that means a minimum of about 10 l/day . But, a resident in the poorest areas may not have access to more than 5 l of water /day whereas middle to high income citizens may receive 10-20 times this amount of water. The reason should force us to a serious reflection about the management of natural resources. What explains such unbalance distribution of a basic resource? Our capability of paying or not for it; nowadays, the much you can pay, the more you are allowed to consume. Such inheritance conduces to the exhaustion not only of "goods" but of organisms that are overexploited to exhaustion, i.e. fisheries, wildlife, etc. Such attitude only benefits the enterprises that manage de distribution of safe water. Such prejudice should be urgently revised to give priority to politics, people and attitudes that really contribute to the availability of safe water for our future and that of future generations.

Moreover, we also need water for our daily sanitation, to clean our houses, cities, industries, to wash away as far as possible our waste and other residues that disturb our aesthetics in our residential areas. At last, but not at least, we need water to reduce analphabetic and human exploitation all over the world. A child, mainly girls in underdeveloped countries where water does not arrive to their houses, needs the whole day to wear the daily needs of water for the family. Day after day she/he has to walk for hours to the nearest water source and back home charging litres of water to cover the family needs. A time that should have been dedicated to her/his education and leisure, but that is sucked up by a silenced kind of slavery at the whiteness of XXI century. The *Declaration of Rights of the Child* express clearly in the 7th principle that "*Every child is entitled to receive education, which shall be free and compulsory....*" (High Commissioner for Human Rights, 1959). Therefore, two basic rights are kidnapped if you are a child in too many countries, the right to life and the right to your education.

Illiteracy was a serious problem in our countries at the beginning of the last century. In 1940 more than 23% of women had no access to basic education in Spain. Sum it up to their lack of legal protection and security, their economic dependency to men and you will explain our high birth rate levels. In nearly 2 generations, birth rates have fall down to the lowest levels in Europe, with less than 1.3 children per couple in the Basque Country, one of the most prosper regions in Europe and with the lowest birth rate levels. Only migration is beginning to compensate the truncated generational pyramid. Insecurity, hopefulness but a low social level of immigrants sum up to the man-dependency system of immigrant women already maintains high birth rate levels in this section of our societies, something that may change in 1-2 generations; as soon

as we make sure the access of women to education. An aspect that is only available in countries where water is a safe resource that arrives to our houses thanks to an adequate management. If overpopulation is a serious problem in your country, work on these 2 main priorities; the access to safe water for the whole population, and the access of women to education and economic independency. The population will reach stable levels in few years, just 1-2 generations. Remember that water is basic for life and that any attempt against the safety of the water is an attempt against the future and stability of your country, against the future of your culture.

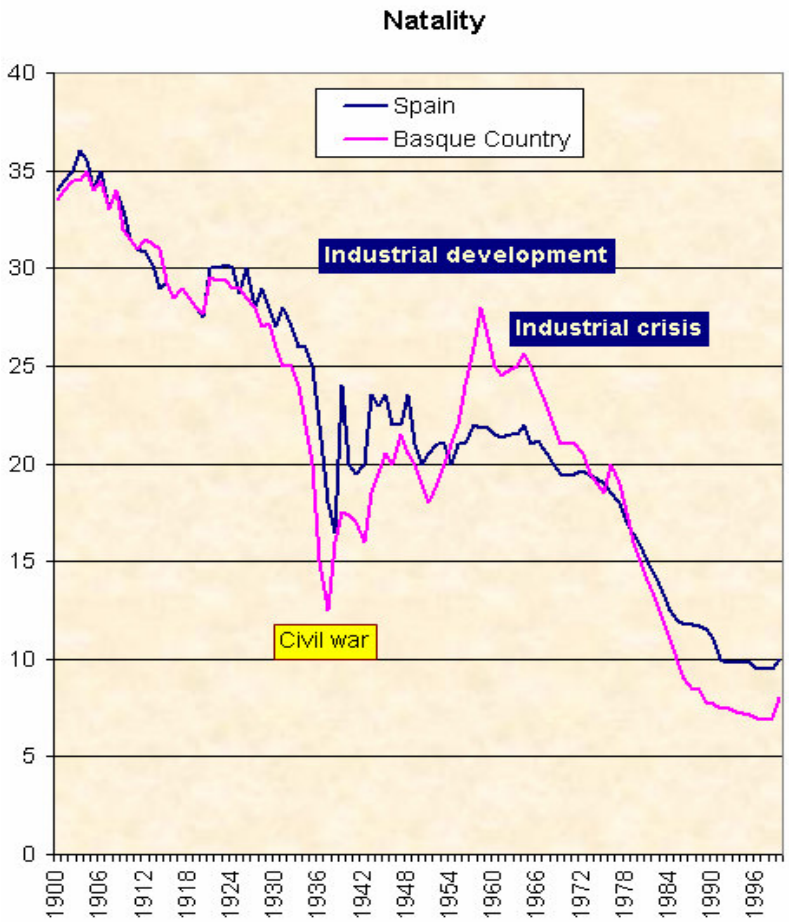


Fig 2.- Evolution of birth rates in Spain and Basque Country during the last century. During 50's and 60's, the Basque Country developed especially the industry of navy and iron that contributed to important incomes of immigrants that trend to abandon our country after the industrial crisis. Therefore, the reduction of the birth rate is not so much related to such crisis but to the access of women to the University and high qualified employments.

Let's go on, what is going to be your second priority in your desert island. The playstation? A wood stick to try to fish something from the waste ocean? You may remember "*Cast Away*", where Tom Hanks had to discover by himself how useless were all those things we give vital importance in our saturated lives, the

car, the laptop, the Game Boy…; his attempts to capture any fish for food during the first days in that desert island. A fishing rod may help, sure. Did you ever think that he was really lucky, extremely lucky? He arrived to an island where water was not a problem at all, and rain guaranteed the water supply, at least the days of rain. He was surrounded by a sea full of fishes and in a forest with plenty of food. But this is not our story; he really had those entire 3 elements that are basic for our survival. Let's go on; what do we really need after water?

2nd.- Soil. Soil is the basis of our economy. A person with land was a woman with future, at least in the past! She/He would have had lots of suitors. Nowadays, people look for other priorities; a stable position, money in a bank account enough for a good house, for a big car, for holidays, and so on, neither time nor money for many children; nowadays, they result too expensive. This is especially dramatic in some cultures, where women have no right to inherit the property of any land and are forced to abandon their own house when her husband or father dyes. If overpopulation is the real basis of our planet problems, give not only water but economic independence and a stable position to women all over the world and birth rates will be drastically reduced in few years. It is not speculative; as previously reported, Spain has been a clear model about how in one generation, the free access of woman to the university (culture) and to the job market (independency) has reduced drastically our birth rates to the lowest levels in Europe, especially in the Basque Country, where I come from (fig. 1). Therefore, if overpopulation is a real problem in "*underdeveloped*" countries, if there is not enough space, or food, or water, for everybody in your country, work hard to give education to the women and economic independency to them. You will solve the overpopulation problem in few years. But let's go on with the question of the soil, the real problem.

Advance of desert is tragic in many countries, and forces people to migrate to our countries. More than 99% of the world's food supply comes from the land, while less than 1% is from oceans and other aquatic habitats (FAO, 1991); there's no potential future for us in deep oceans. In a 5 year period ('94-'99) the Gobi desert expanded over 20,000 square miles. The area is larger than New Jersey and Massachusetts combined. The Sahara in Northern Africa is the largest desert in the world; at 3.5 million square miles is larger than the continental United States; it has spread south over 250,000 square miles in the past 50 years. The desert is about 150 miles from Beijing and still expanding. The first effect of the expansion of the deserts is the lost of fertile soil. *Desertification - expansion of the desert - is a grave problem that affects not only those countries in the direct path of the encroaching arid lands, but also has implications for the rest of the world. To give some idea of the scale of the problem, the last 50 years have seen the Sahara desert spread southwards to cover an extra 65 million hectares, and on a global scale, the area of useful land lost each year exceeds 6 million hectares*. (Oxfam International) and the worst new is that it does not stop; it advances exponentially year after year, as the hollow in the ozone layer.

And now check the news about the boats arriving every day with dozens of immigrants to our coasts. Where do those *illegal* immigrants come from? Most of them from tropical countries where the lost of forest and desertification are their main environmental problems, including the accumulation of waste from irregular origin, probably from your country too. Next time you change you mobile telephone or your laptop check first where is it going to end.

Twenty-four billion tons of topsoil is lost worldwide each year, as the human population grows. And you will do right now the easy estimation, as the population grows we lost more fertile soil due to the need of more surface for food production; a fallacy as false as easy to conclude. More than the 80 % of the world production is consumed by the 20 % of a bulimic society obsessed in accumulate goods, that has no time to consume, and that prefer to throw it away as rubbish before sharing it with the most unfortunate sectors of our own societies. A perverse evolution of modern societies allows people to develop money-centred priorities in the access to basic goods, as much as we assume that we are able to pay for them, as much as we are able to store. Those that can not pay are directly rejected from the "group", increasing the list of marginal people in suburban areas or continents; as Africa, the forgotten continent. Let add a new film to our particular cine-forum, the *Darwin's Nightmare*, a film to be seen at all schools and civil forums of our overfed societies. *"I could make the same kind of movie in Sierra Leone, only the fish would be diamonds, in Honduras, bananas, and in Libya, Nigeria or Angola,crude oil."* (Hubert Sauper, Film Director). In this film, an example focused on a pest, the Nile Perch show to us how "*last Christmas, the children from Europe received grapes from South Africa and the children form Africa received tanks from Europe*" (pilot interview)… *This booming multinational industry of fish and weapons has created an ungodly globalized alliance on the shores of the world's biggest tropical lake: an army of local fishermen, World bank agents, homeless children, African ministers, EU-commissioners, Tanzanian prostitutes and Russian pilots*…In the Eastern Congo alone, the casualties of war on each single day equal the number of deaths of September 11th in New York." (film synopsis). You can try to check the true stories related to the traffic of diamonds, coltan, fuel, etc.

Acts as simple as refusing wood and other incomes of irregular origin, consuming local products or fair trade certified goods, and refusing hypothetical needs created by aggressive campaigns of marketing, may contribute to a better distribution of goods, ensuring those cultures a real and sustainable development and a future in their own countries. You may have seen them in your towns, with illegal copies of CDs, DVDs, *jewels*, etc. You may have also bought some stuff, thinking that you contribute to make him earn some money. People that depend on mafias to survive that do not receive any benefit from those illegal activities rather than allowing them to remain alive as well as the sell an amount of products every day.

I have a friend that always defends that she will never sell the land she inherited from her parents. She has a good work at the university, a nice house in the city, two nice children -may be not so children right now- and with an adequate education to be sure about their future. And she always says it, that she will never sell the land she inherited from her parents. "*You never know what will happen in the future"*, she argues. You may have a stable situation and you lost tomorrow your work, a bank crash, a divorce, doesn't matter whatever happens in a moment of your life, and all your material possessions are useless. Money is not digestible at all, cars are useless without fuel; their values are absolutely subjective. Never forget the situation in countries like United States, Argentina, when people lost all their possessions and had to learn how to survive during and after the depression. Is in such moments when we learn adequately the real value of things and priorities. Soil, as well as access to safe water, is actually the basis of speculation. Millions of people are forced to abandon their lands as corrupted governments sell to trans-national corporations to enrich themselves and their relatives. The corrupted management of land and water, the first two basic resources for our survival, should be prosecuted and condemned as the most terrible sin of this century.

3^{d}.- Forest or seeds, it's just a question of time. Mathai used indifferently the terms "forest" and "seeds" in her conferences. Put all the ingredients together, water + soil + seeds and, what will you get if you wait for time enough? That is the forest and an adequate soil where to obtain productive cultures of vegetables and legumes, that will ensure your survival and that of your children, generation after generation. That is sustainability, nothing else. Future is not under the sea. *Homo aquaticus* was a nice dream for Jaques Cousteau, but just a dream. The ocean is an immense desert; remember the tragedy shown in Waterworld; things changed when they arrived to a place where the three elements were found together, their particular Garden of Eden. Never miss the north, face the 'sirens calls' of speculators and fight against them; check your real priorities in life. It's a hard crusade but is your future, and the future of your relatives. "*Plant a tree, educate a child, write a book*", those are the keys of the real happiness, those are the keys of future for humankind; forest, children and culture; any attempt against them are attempts against your own identity.

Therefore, you should include the project of the *Forest* in your suitcase, in your project of life. Not the forest as an entity, neither soil, nor tons of water for years of thirst. It's obvious that there is no room enough inside a suitcase for such quantities of elements to maintain you alive for years, but we knew from the beginning that we were working on a imaginary project for an imaginary island, our island, Gaia, the planet where you live, that really is 'in the middle' of nothing. We are in the middle of nothing, surrounded by desert planets, by desert galaxies. Nothing but speculations has been all tentative to try to find symptoms of live in other galaxies. If you destroy your environment, you are destroying yourself. "*I'm myself and my circumstances, and if I don't safeguard them I do*

not safeguard myself', (Ortega y Gasset, Madrid, Spain, 1883-1955)**.** That is the basis of ecology; that is the core of sustainable development. You can not survive alone, as you can not survive in a desert island without water, soil or seeds. Nevertheless, although a forest is to big for a portable suitcase, seeds do not need to much space, and if you have had care to be sure that you have the elements previously detailed, water and soil, you will be sure that the forest will be a reality in your future and in that of your future generations that will inhabit your island, your project of life.

From the self-sufficient land manager to the land speculator

Human beings have managed natural environments from the beginning of our own history. First we just catch it, collecting vegetables, hunting of fishing other animal species; with time, we developed ways to control the production of our basic needs.

At the beginning there were open lands and forests, depending on bio-geographic specificities.

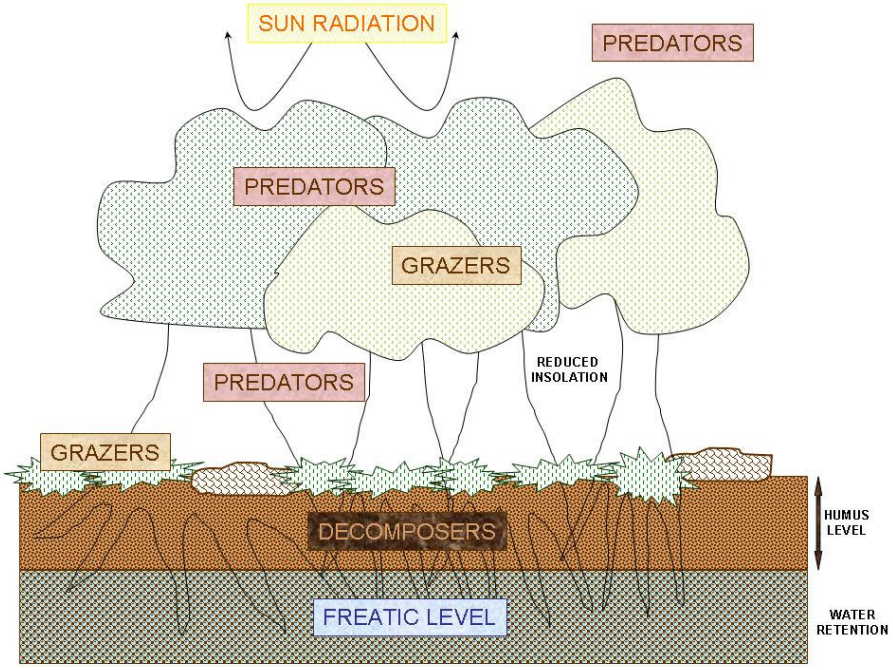


Fig 3. Structure of the biotic community inhabiting any forest of our planet; years of common evolution have developed complex interaction between each integrant of the community. The disappearance of one piece of the system may force to the disappearance of many other pieces directly related to it.

Human beings evolved in open fields, escaping from predators and developing instruments to compete directly with them for the food. With time we developed

stable structures culturing the soil and rearing animals for our own consumption (fig 3a). As our production capability increased, we began to share and interchange benefits with neighbours evolving towards bigger and more autonomous society models (fig 3b-c). As produced, waste had to be naturally recycled by decomposers in soil; until we accelerated the process at such speediness, producing more and more waste, that nature has arrived to be unable to process it. As we don't want to assume our own waste, we search for places were to store or destroy it. No goods return to the soil that feed us in an unbalance model of development that requires of artificial incomes to maintain it.

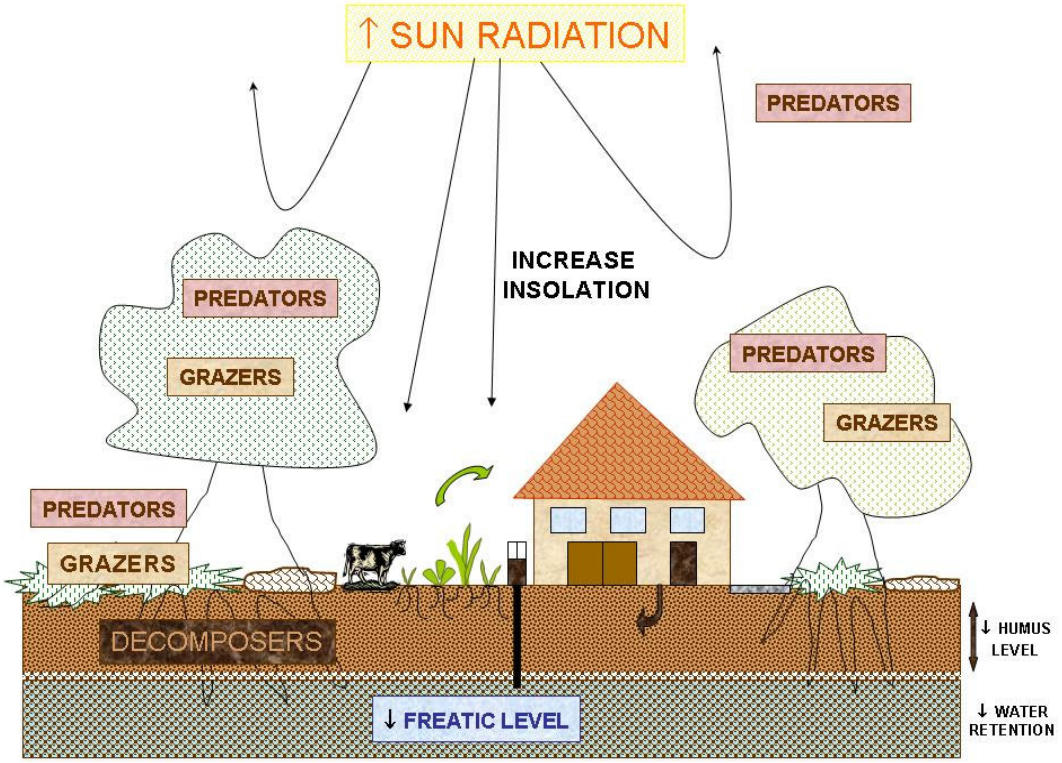


Fig 4 . Forest clear-cut and surface used for residence, agriculture, farming, leisure, etc. If organic residues are not returned to the soil, it will lost its fertility after years of abusive exploitation. The reduction of the root system due to deforestation difficult the maintenance of the freatic level of subterranean water: The increase in the demand of water for irrigation, sanitation or leisure makes the rest.

Modern societies have evolved at the backwards of natural processes, isolated in urban areas were technology has increased our ignorance about natural processes (fig *) . From 1950 to 2000, the populations of the cities have been increased four times (Smith and Braein, 2003); four times more

people that have to be "feed" with natural product transported from natural areas.

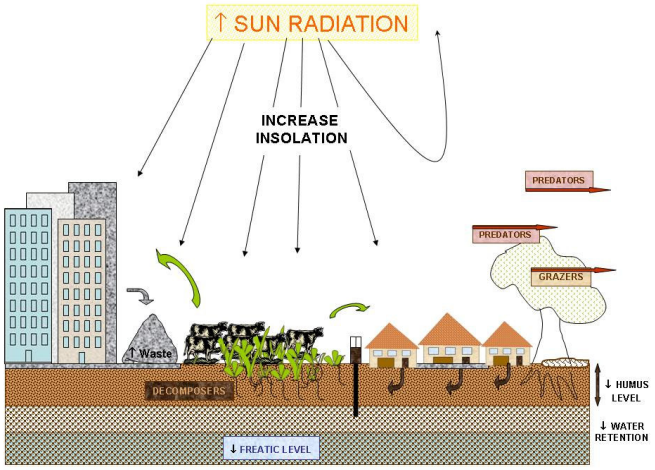


Fig. 5. As human settlements increase the soil occupation, primary resources should be produced and transported far away from the areas of demand, the requirement of an exponential increase of primary resources forces to the development of unsustainable ways of production and management of waste and an increase of displaced people that has no access to their basic needs.

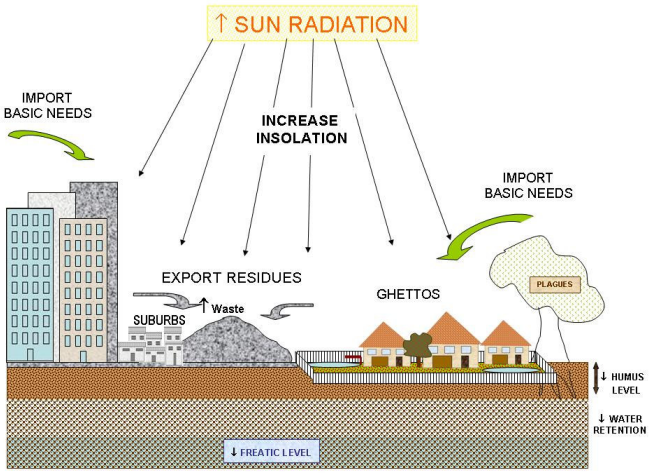
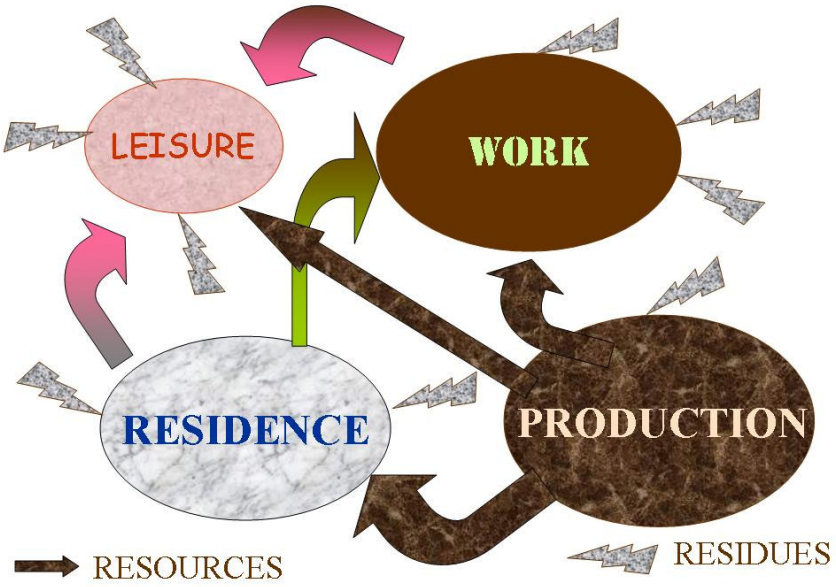


Fig 6. People with resources tends to get isolated "golden ghettos" due to safety reasons The energetic demand is maximized in those points for the transport of incomes, export of residues as far away as possible and maintenance of a life style based on consuming as much as you can afford.

To increase the production, modern technologies that required of specialised professionals are demanded and controlled by economic power groups that

displace the traditional family units to marginal areas and activities. A clear model is the increase of drug production in tropical regions where people has no access to food or other basic needs.



To satisfy the demand of those that can pay for those resources, products should be transported from long distances, increasing the energetic demand. As result of our uncontrolled exploitation of natural resources, deforestation has arrived to critical levels all over the world; it may be the real global process that characterise all the continents of our planet. Nowadays, we live in a place with single houses, unproductive gardens and swimming pools for each family units, that increase the demand of safe water at unsustainable levels; but we can pay for it, and this is enough for our conscience; we work far away, sometimes in another region, we produce technologies in other specific areas but importing all the basic resources needed at all these points from distant areas of our regions (fig. 4). In all those points, an increase of incomes is produced and more waste is generated that should be transported as far as possible or simply destroyed by incineration as we have no time to get worried about waste problems.

Such unsustainable model of development of modern societies has increased the demand of natural goods to such levels that most of our “needs” should be imported from those considered as underdeveloped countries, displacing thousands of people from heir natural areas. People menaced by unfinished wars to control the management of their richness. Our frenetic rhythm of life increase

the demand of stupefacient drugs to allows us to maintain it, drugs that are produced instead of basic needs for local inhabitants of those regions.

Deforestation, the real condemn of humanity first sin

Forest is the climax of terrestrial ecosystems and the basis of our economy (fig. *). It is the main responsible of fertile soil production and prevents the lost of fertile soil due to wind and water erosion. It takes hundreds of years to arrive to develop a forest and an adequate layer of productive soil, but few hours to cut it down with modern technologies.

When you plant a tree you may have to wait all your life until you see it completely developed, but it takes one's breath seeing it fall down on the floor. Forests were always there and wood seemed to be an endless resource. During the last century, more than 50 % of primary forest has disappeared from the earth surface. For example, "*in three decades, 15% of the Amazonia forest was clear-cut and 4 or 5% was degraded through timber harvest or fire. Each year, an average of 18,000 km^2 of forest are felled—an area larger than Massachusetts and half the size of Costa Rica*" (Nepstad, 2006).

There will be always isolated exceptions, as the real interdependence with the forest that is observed in some aborigines, as Amazonian. Out of them, human beings have always evolved and developed at the expense of the forest. Our avarice and fear towards beasts arrived to the forest early in our evolutionary process. We evolved at backwards of forest values with a special fear towards inhabitants of this delicate ecosystem. This is specially dramatic in our culture, with ancient stories told to our children generation after generation where a bad woman inhabit in the profound forest in an old house may eat your children (*Hänsel and Gretel*), poison her step-daughter (*Little Snow-White*) or where "beasts" may be waiting for young girls to be forced (*Little Red Riding Hood*). Forest is the place were indefensible people, traditionally women and children, should never go into; a place full of dangers, monsters and bad people; refuge of terrorists, a danger for our allies. Many cultures have refused the forest as an entity -except for wood production- destroyed it until their own destruction. After the industrial revolution, it has been systematically ignored and placed under abusive exploitation. Take a look to your country. Improve this moment to walk through your countryside and observe the surface of original forest that already survives surrounding your village; if you are lucky enough to have any redoubt of your ancient forest in your surroundings. Go into the forest and observe, observe in absolute silence, concentrated on the noises, on the movements surrounding you and fall into attention that you are in something else that a group of trees. As well as water is something else than molecules of H_2O, a forest is much more than a group of trees. The forest is the most mature and balanced system on the earth where all creatures look for protection, home or food. And we destroy it each time we cut down a tree. We have exploited the

forest since our origins. We hunted his animals, took death tress and sticks back home for fire, cut his wood for construction, and managed his soil for agriculture. Balance and sustainability was already possible, until we forget our interdependence and began to destroy it massively, to replace it with monocultures of imported species that destroyed the natural balance of our soils, to demand his soil for farming activities and urban speculation.

Clear cutting the forest gave to us not only the award of the wood, but an adequate soil where to plant our vegetables and legumes, an open field were our cattle could freely graze, a place where our children could play free of the beasts that wait for them in the profound forest (fig *). We lost too many years ago the culture of the forest, and it's actually shown as an enemy to control, exploit and destroy.

Industrial era gave us fertilizers to replace the natural flow of organic matter that occurs in a balanced forest, and we consider ourselves capable to survive in deforested regions with open fields and fast roads through which arrive as fast as possible, as far as possible. But, have you ever stopped and think about where do you really want to go, where do you really need to arrive? As the rabbit in Wonderland, we always feel as we are arriving late… may be too late in this irreversible process of deforestation. Let check the consequences of our irresponsible management of natural forests

1st Lost of fertile soil.- Forests are the unique responsible of the development and preservation of fertile soil. Adequate compost policies may return some of the organic compounds to agricultural surfaces. Nevertheless, most of the organic production (food) is extracted and transported far away from the production regions and waste accumulated or destroyed far away from were the organic matter was extracted. Therefore, our farming activities will always contribute to the lost of soil fertility. Unproductive soils found new investors in industrial activities and were abandoned charged of pollutants after the industrial crisis. The Basque Country has a pioneer legislation referred to the management of polluted soils. Lost of primary forest and industrial crisis have been two of the main handicaps inherited in our country after years of an absolute lack of environmental legislation. Actually, new ways if enrichment are found through urban speculation and we are not far away of this problem as a region with an important surface of coast affected of another crisis, the catastrophic reduction of traditional fisheries (ref).

2nd Weather and water unbalance.- Forest is something else than a simple group of trees, within its important function we know that they are the main responsible of weather regulation. Massif movements of water under gaseous stage in the atmosphere are under the control of the forest. Trees attract the clouds and control the rain, reduce the impact of the raindrops on the soil during a storm, prevent the erosion and retain the water in the soil maintaining the

freatic layer under balanced and sustainable levels. A deforested slope lost easily the fertile soil after a storm; increase the sediment levels in rivers and dams and the risk of inundations.

Press Release

BBC news, October 02 2006 http://news.bbc.co.uk/2/hi/asia-pacific/5394626.stm

At least 15 people in Vietnam are now known to have died as a result of Typhoon Xangsane, which buffeted central provinces over the weekend.

The coastal city of Danang was hardest hit, with hundreds of people injured and thousands of homes destroyed.

The typhoon has destroyed thousands of homes

The Times, December 02, 2006

Hundreds dead in landslides

MANILA Typhoon Durian may have killed up to 400 people in the central Philippines after heavy rains and winds sent tonnes of mud and boulders the size of cars crashing on to villages, the Red Cross said.

Those are not the first tragedies in tropical areas due to the lack of a global environmental policy, and are probably not going to be the last one this year. Millions of people will continue to migrate to marginal areas and to developed countries if no alternative is developed to our unsustainable life style.

3d Lost of biodiversity.- An international team of scientists discovered recently what they called a *"lost world"* in the Indonesian jungle (February, 2006); a paradise with dozens of new animal and plant species to be described. A paradise, that may be clear-cut and all these new species condemned soon to

extinction due to speculation and to the lack of a global forest protection policy at planetary scale. Global warming is neither a joke nor a fantasy of hysterical ecologists. If we ignore the importance of the Forest as main regulator of weather all over the world, this risk will continue to menace us. It is continuous and dramatically occurring and denounced in all tropical countries, from south-eastern Asia to Amazonian and tropical Africa, the countries with highest level of migratory movements to suburban areas and techno-developed countries. It has been traditionally related to the need of soil to cover increasing demand of agricultural and farming activities. Nothing but a fallacy when we observe how deforestation continues and whole villages are forced to abandon their lands, millions of people are forced to migrate and their lands occupied by speculators with more power than local governments and corrupted administration. Women and children raped and forced to prostitution and slavery in our countries where such activities, although illegal, already exist. The abnormal situation of distant regions such as Galicia, Amazonia, western coast of Africa, etc., where climatology and primary forest can not justify such percentages of fires (cf. FAO 2001 report), is a clear symptom of an ill society –or probably that of their direct managers- that systematically ignore the value of the forest preservation for their own future. What do all these countries have in common? The use of their deforested soils for extensive monocultures and farming, production that is selected and controlled by transnational enterprises with more power than the local administrations, with capability to control your own needs and desires through aggressive campaigns of marketing; agriculture too many times deviated towards drug production to satisfy our demands of leisure and "intergalactic trips"; speculative urbanism; tourism isolated in "golden ghettos", ignorant of the real country that they visit, consuming goods that are not accessible to people that live in marginality and is forced to prostitution to survive. Too many denounces that are passed over every time we read the news in our journals.

Fig. 7. A campaign of marketing; in the text: "*Fulfil all your desires. We celebrate one year of avarice. Avarice vicious me*". This is an example of an aggressive campaign of a computer store in the Basque Country. Computers and mobile telephones are one of the principal destinies for coltan, the main cause of the "ethnical" war in Central Africa.

Overpopulation and farming have traditionally been shown as the main cause of forest destruction. Modern human population is growing due to inadequate nativity policies and people are forced to abandon their lands and go into the forest, and probably destroy it to obtain portions of land were to culture their basic needs. "*Nowadays we know that famines are created by policies, not by pests or droughts*." (Southgate, 2006). Abusive taxes and restrictive laws limit in corrupted countries the potential of the people to decide about their own habits. You may believe already that Africa is a country were people has nothing to eat and that is the reason of the historical famines; nothing more distant from reality. Except in punctual areas, were the lack of rains and desertification of soil has reduced dramatically the fertility of the soil, Africa is one of the richest continents on the world with minerals –diamonds, coltan, fuel, etc.-and other primary stuff that is very well paid in our countries, but whose benefits never arrive to their habitants. "*Above all, governments need to get out of the way, to cut restrictive tariffs, to remove state marketing boards, to allow businesses to work - because Africans are perfectly capable of feeding themselves if only they were allowed to."* Southgate, *Ibid*.

Most of these people are forced to abandon the lands were they born, were the traditionally worked due to speculation and to illegal uses of those lands.

Forest fires, who gets benefits from them?

Forest fires have always existed. They contribute to the return of minerals to the soil, minerals that are absorbed through the root system of the trees and integrated in the molecules of their own composition through specific metabolic routes. But in rainy areas, water may solve those mineral before they are absorbed by the roots and contaminate rivers, underground water etc. Forest fires have been an historical problem in my country, especially in Galicia (N. Spain). As Amazonia in South America, this is the Spanish region with highest percentages of uncontrolled fires; something abnormal due to our climatology, but that shows the risks of doing policy at the backwards of people.

The tragic situation reported from Galicia this last summer is nothing new. In two weeks, more that 10 thousand hectares of forest burnt out in this humid and rainy region of Spain. Galicia suffers from forest fires every year, but the last one (2006) has been extremely dramatic menacing the safety of people inhabiting suburban areas. Northern Spain has historically been known from his green fields, rich pastures where milk production and derivates where well known in the whole country, and are already demanded and popular. Cattle reduction after UE regulation transformed most of those pastures in monocultures during 1980s, especially pine in the gulf of Biscay and eucalyptus more to the west due to climatic preferences of both species. You may not ignore that Galicia is one of the main ways for drug entrances for European

consumption. Drugs are produced in deforested tropical soils and controlled by oligarchies that displace entire communities from their original settlements.

PRESS RELEASES

LA VANGUARDIA - 18/03/2002

BIODIVERSITY

Two million hectares of Peruvian forest have been devastated for coca plantation.

BBC news, 2nd October 2006
http://news.bbc.co.uk/2/hi/africa/3528519.stm

Cannabis remains the most widely grown drug on the continent

'Cannabis switch hits food crop'

The UN drugs watchdog has warned that food shortages in Africa are becoming more serious because of a shift from growing crops to cultivating cannabis.

Something similar occurs in tropical forests. Transnational corporations buy soil to indebted governments for monocultures displacing whole villages from their traditional cultures to control the crop and drug production, mainly in Central America and Southern Asia. Deforestation is arriving to dramatic levels in specific regions of the planet. Only the Amazonia forest includes 10 different countries where we can be find 30 million of inhabitants from which 20 million are Indigenous that speak over 200 indigenous languages (*cf.* Nepstad, 2006). All these people and countries are actually pressed by farmers, wildlife trade, mineral, oil and gas prospectors, drug producers, soil speculators; there are too many people interested in the richness extractable from primary forests where human and non human beings are simple merchandises or obstacles to be overthrow. Massif migration that disturbs so seriously our peaceful lives is forced in origin by land speculators, and maintained by ethnic wars, supported by gun producers and runners that are or act, once again, under the connivance of our "developed" countries. If you consume them, consider your part of direct responsibility on the tragedy of whole cultures all over the world, on the thousands of people died on their cruises to arrive to our countries.

Tropical forests are destroyed not only due to the inherent value of the wood but to obtain soil were to cultivate the coffee, cocoa or tea you drink every morning, the seafood you eat for Christmas (i.e. mangrove destruction several times denounced) but also for illegal goods of irregular origin

With the lost of the forest, the soil remains vulnerable to water and wind erosion. Last tragedies occurred in south-eastern Asia (Press Release, *Ibid*) due to water floods -and more recently in northern Argentina, as I visit the country for research- are mainly due to the serious deforestation of the mountains surrounding the urban areas. Tons of mud transported by water, buried hundreds of people in few hours.

Have you ever asked yourself where do all those tons of mud come from each time a storm flood a village? Forests are the main regulators of the stability in soil. With their top they reduce the impact of the water on the soil; with their roots they prevent the soil erosion during the rain. Unfortunately, the lack of rigorous statistics difficult considerably an adequate estimation about the actual rate of lost of fertile soils all over the world.

Fig 8.- Panoramic view of one of our hills from the UPV campus (Leioa, Bizkaia). This image is quite similar to what you can appreciate on many regions all over the world, deforested mountains unproductive and absolutely vulnerable to water erosion, with the consequent lost of fertile soil for future generations, and periodical inundations of valleys where the main human settlements are placed. The situation arrives to tragic levels in tropical areas where rains are concentrated to specific periods of the year.

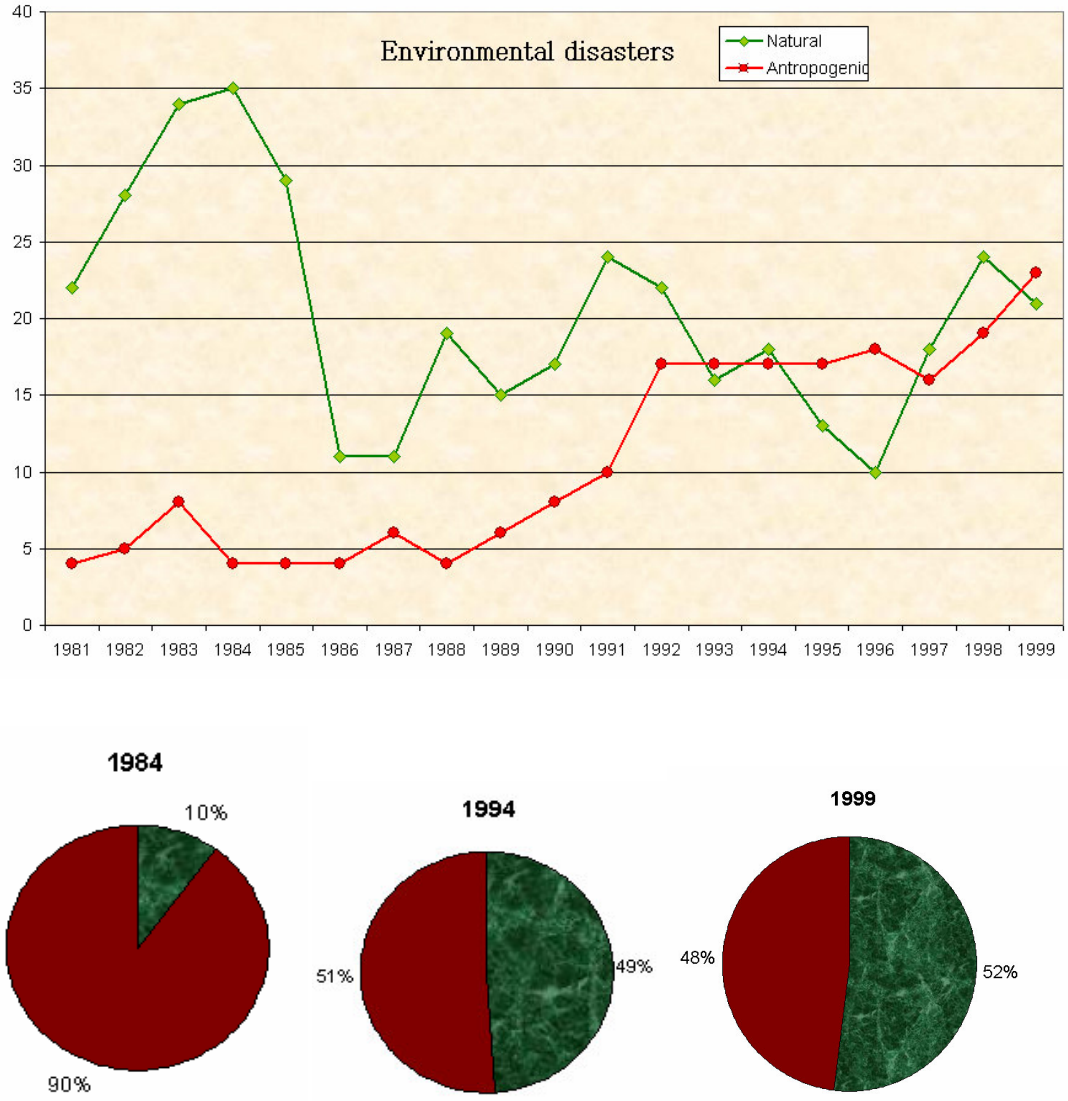


Fig.9. Tendency of the disasters caused by human activities (brown) opposite to those of natural origin (green); a) historical evolution through the last century, b) comparative percentages for years 1984, 1994 and 1999. Whereas those of natural origin remain nearly stable with a slight tendency to be reduced during the last years, anthropogenic disasters are increasing exponentially.

Artificial fertilizers have shown to be short term solutions to the progressive lost of fertile soil all over the world, sometimes with unproductive soils finally abandoned as unique end of the story and human settlements moved to more productive areas. Uncontrolled deforestation, probably a more correct expression should be uncontrolled "*deforestators*", are the main responsible of the lost of fertile soil all over the world.

The victim of our unconscious model of development will always be the environment and the *poorest*[1] of the world, and we rarely assume our responsibilities.

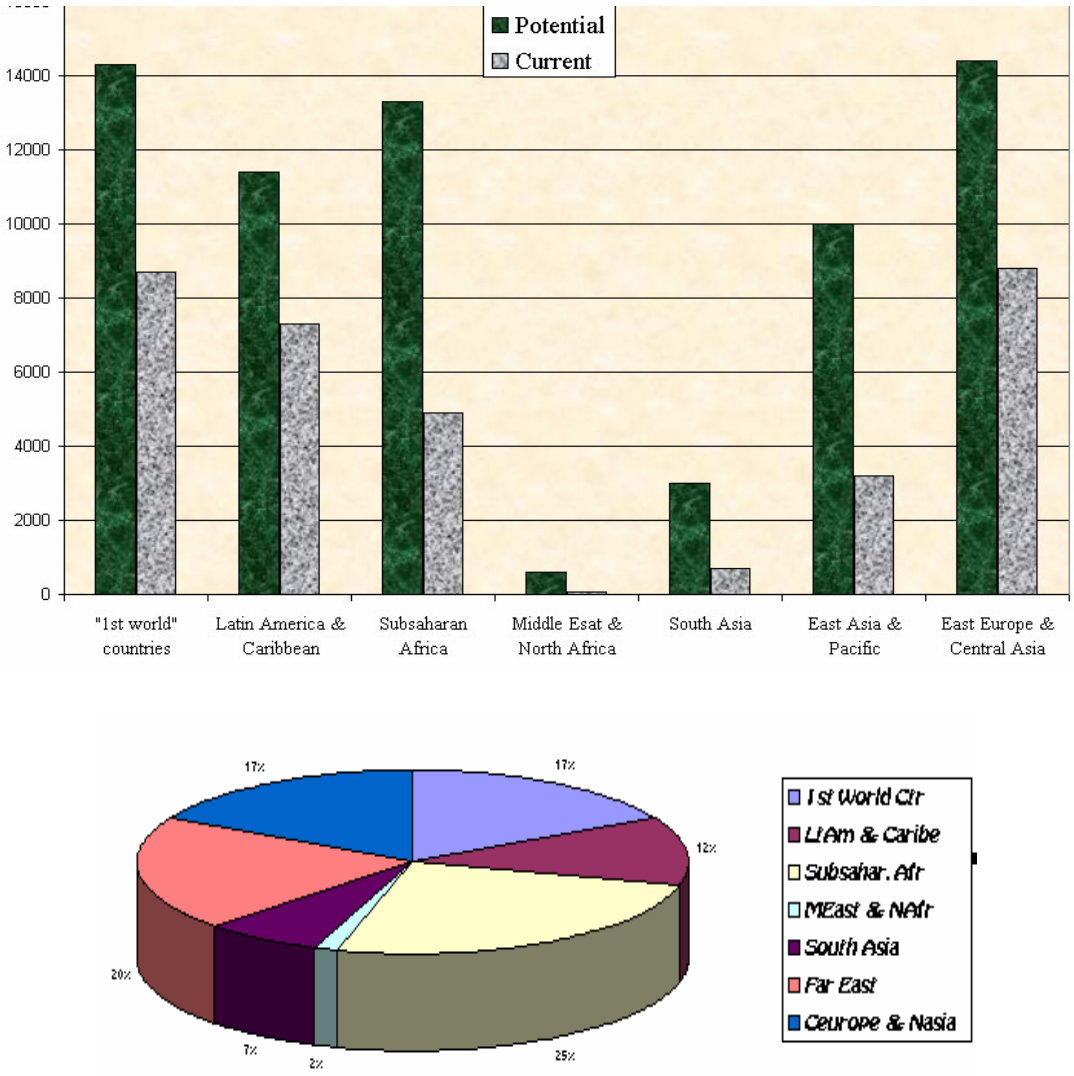


Fig 10.- Percentage of forest surface lost during the last century in the main geographical regions (source: International Monetary Fund, Organization for Economic Co-operation and Development, United Nations & World Bank Group, 2002)

[1] Considered poor because the access to the basic needs, food, safety water, fertile soil, has been denied to them

Island and coastal inhabitants, the main victims

At global scale, continental coasts and small islands may be the first to be affected of our lack of culture towards forest preservation. On December 26, 2004, the highest tragedy of our history was recorded, with more than people died after a tsunami due to an earthquake (BBC News). No prevision and no preventive measures permitted the evacuation of million of people inhabiting those areas in south-eastern Asia. The forest, a mangrove, helped to a whole village -The Moklen people in Southern Thailand- to survive, housing their people during the disaster. They were the first t return to their village after the disaster (IUCN, 2006). "*Two people died in the settlement with dense mangrove and scrub forest, while up to 6,000 people died in the village without similar vegetation"*. (Kinver, BBC News)

Islands are the most vulnerable regions of our planet due to the lack of terrestrial regions in their neighbourhood to protect them against wind and water erosion. Land area covered with forests varies a great deal among small islands, ranging from 94.4 percent in Suriname to less than 1 percent in Haiti (FAO, 1999). As main regulator of water balance, the forest acts as a regulator of storms, reduce the impact of water on soil and stops the erosion and lost of fertile soil in tropical areas.

One of the main risks of global warming is the disappearance of the ice deposits in mountains (glaciers and poles). Where is this ice going? As water, through rivers and streams, it will finish at the sea with the consequent elevation of the sea level; may be just some centimetres, but a level enough to menace the coast of islands, especially those of coralline origin. Some inhabitants of Polynesian islands are beginning to ask for refugee to the continent. The disappearance of natural paradises in Oceania and coral reefs is going to be the first symptom of our illness. The lost of the natural reserves of water in Glaciers and Poles the inheritance for our future generations.

Discussion

I've chosen the example of the forest because it was my main research topic when I was preparing my PhD. During those years of study of the faunal inhabitants of the soils I arrived to understand how much important was the forest four our future as human beings, and to differentiate between the Forests as entities and those monocultures were only trees could be seen, nothing else. You may have other questions or problems that fear you in your community. Focus and work on them. You have an important amount of non governmental organisations with ideas and projects already to be developed, with vacancies; check their web pages periodically. Do it alone if nobody else understands your worrisome, but work. Never think that others will arrive to help you. You may be alone in your adventure, but is your story, the story of your life.

When Van Rensselaer Potter suggested the term *Bioethics*, he expected the development of a forum where to build a *bridge to the future*. In 1999, a group of experts met in my country developed the *Declaration of Bizkaia on the right to the environment*. We cannot conceive life without a substrate where to develop it, without an environment where to survive. We are not much different to other animal species. Although we have been able to develop technologies to get as much isolated as possible from the natural environmental risks, we need the natural resources for survival. As a forest, our climax as Gaia should be developed on the basis of a balance forest model, with a balance soil as substrate, with balanced fluxes of energy. *"Diversified local economies are stronger than monocultures"* (IFRC, 2001). In Ecology, diversification is synonym or richness. Homogenization of cultures, languages, ideas, development models, etc have always ended on instability and ethnic confrontations. Ignore other cultures and reduced them to starvation and isolation will conduct to our own self-destruction. Poorness abolition should be our priority in the construction of our own future.

Wangari Muta Maathai, the president of the NGO *"Green Belt Movement",* visited the Basque Country last September, 2006. It was a great experience to share with her the importance of a culture of the forest in the sustainable development of people all over the world. She earned the Nobel of Peace 2004 thanks to her culture of sustainable development and peace through the environmental management. Her project to involve displaced women in the reforestation of their country will be historical as no other person has had such power to restore deforested regions. "*GBM provides income and sustenance to millions of people in Kenya through the planting of trees. It also conducts educational campaigns to raise awareness about women's rights, civic empowerment, and the environment throughout Kenya and Africa."* (GBM main page) If something really urges is the development of transparent policies to protect and restore the primary forest at a planetary scale in the same way as we have understood the need of protect the coral reefs. And old oriental sentence remembers that we are like snowdrops, extremely vulnerable on the hand but with an immense power when we advance all together as an avalanche. Remember that you will be never alone. Find a project to develop in your country and you will meet people interested in joining you. "*Think globally, act locally*"

Poverty is Denial of All Human Rights

Peace should be understood in a human way – in a broad social, political and economic way. Peace is threatened by unjust economic, social and political order, absence of democracy, environmental degradation and absence of human rights.

Poverty is the absence of all human rights. The frustrations, hostility and anger generated by abject poverty cannot sustain peace in any society. For building stable peace we must find ways to provide opportunities for people to live decent lives.

The creation of opportunities for the majority of people – the poor – is at the heart of the work that we have dedicated ourselves to during the past 30 years.

Muhammad Yunus **The Nobel Peace Prize 2006,** Nobel Lecture, Oslo, December 10, 2006.

Now it's time to look face to face to your mirror and revise your standards. You may be living in a developed country; you may be part of a middle class, with a stable position, with a school. You may be part of the 20% of human population that has daily something to eat and a bed were to sleep; 20% of population that consumes more than 80% of natural resources whereas the rest of the world may be surviving with less than 1 $ *per* day, that may be sleeping in the bank entrance of your quarter, or that cannot go to school because has to fight in mad-full wars. An 80% that has no time to discuss about abortion or euthanasia, as surviving is their unique priority; an 80% that will have no access to those transgenics that are supposed to solve the problem of hunger in the world, a problem based only on distribution not on production; an 80% whose stem cells will never contribute to their development. Re-consider your priorities and face up speculators and corruptors. May be your own future is under risk. You may be disappointed with the actual massif arrival of immigrants to your country. Think about your part of responsibility in the actual unbalanced situation between "*developed*" and "*underdeveloped*" countries. Think about the risk of being the next.

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Democracy and Environmental Issues

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Abstract

There is a prima facie conflict between responding effectively to environmental issues and democratic governance. I discuss three problems which bring out such a conflict and spell out a conception of democracy (an aggregative conception) according to which the conflict is unavoidable. I then argue that a different conception of democracy is preferable (deliberative conception) and that according to this conception, there need not by any conflict between responding effectively to environmental issues and democratic governance.

Is there a fundamental conflict between responding effectively to environmental issues and democracy? Problems which arise due to the special character of environmental issues and a particular conception of democracy indicate that there may be such conflict. In this paper I consider three such characteristic problems:

(1) The problem of institutional decisions.

(2) The mismatch problem.

(3) The problem of external enforcement.

The first problem stems from increasing reliance on expert institutions in decision making regarding the environment. If reliance on expert institutions is unavoidable due to the complexity of environmental issues one wonders how, if at all, the general public can have a direct impact on decision making in this

realm. A common answer is that the general public should have very limited access to such decision making.[1]

The second problem is caused by the fact that environmental consequences of either individual or collective actions may affect distant places and not become visible in the foreseeable future. The space of environmental effects is vast, both spatially and temporarily. A polluting factory may not cause harm in its immediate surroundings if prevailing wind patterns are favorable. Even when it does so the damage may not become apparent for decades. Yet, the very same factory might alleviate unemployment. This leads to a mismatch between different preferences. Preferences for a clean environment, sustainable development etc. will be weak if they attach to things that are distant, debatable and even uncertain. But preferences for full employment attach to what is here and now. It is clear what they are for, and it may also seem clear what can be done to satisfy them.

The third problem arises because of the local focus of democratic decisions and the global character of environmental issues. Responding effectively to environmental issues such as air pollution requires coordination among many parties (nations, states, cities, townships), but the only way to achieve coordination involves an external agent (international institutions, federal government, municipal authorities) with the ability to monitor the relevant collective actions. But this transfers authority from those most directly affected into the hands of external agents which may frequently have the power to constrain local choices.

In the first section I discuss these characteristic problems in more detail. In the second section I discuss a common conception of democracy – the aggregative conception – according to which environmental issues and democracy are in a fundamental conflict. In the third section, I discuss another conception of democracy – the deliberative conception – and argue that it is preferable to the aggregative conception. In the final section, I argue that from the point of view of the deliberative conception of democracy, these three problems need not demonstrate a fundamental conflict between environmental issues and democracy.

[1] This is demonstrated by a proposal now under discussion in the Icelandic parliament. Earlier laws defined a substantial role for an input by the general public into the decision-making procedure but the proposal now under discussion aims at restricting access by the general public.

1. The three problems

Democracy and institutional decisions

To illustrate the problem of institutional decision I focus on a recent environmental controversy in Iceland: the construction of what will be the biggest hydroelectric power station in Iceland, Kárahnjúkavirkjun, which is now under way in the north-eastern part of Iceland, in an area in the Icelandic interior that used to be one of the most pristine areas in Europe. The project is huge. It includes the one of the tallest dams in Europe with a 190m vertical drop and a 57 km^2 reservoir, whose water level may fluctuate annually some 50–75 meters.[2] The generating capacity of the power plant will be 690 MW, and it will increase energy production in Iceland by about 7%. This takes place in a country whose population is just below 300,000. These figures show how huge the project is.[3] The complexity of the project is heightened by several factors, two require special attention. First, the main water supply comes from a glacial river that is moved from its own path to the path of another river. Second, the reservoir is in the Icelandic highlands where danger of erosion is considerable. The importance of these two factors is increased by the fact that the river, which provides the main water supply, is especially muddy. At the mouth of the river, this fact will have profound effects on the coastline and the ecology of the ocean. At the reservoir it increases the danger of erosion profoundly due to the amount of silt that will be left on the banks of the reservoir when its water level has reached its lowest point.[4] The project has met with much resistance, both in Iceland and elsewhere; the benefits are questionable, especially if we look sufficiently far ahead, while the immediate environmental sacrifice is unparalleled in Iceland and the risks taken are staggering.[5]

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[2] Technical information about the project can be found at the website: http://www.karahnjukar.is/En.

[3] In addition to the hydroelectric power station the Kárahnjúkar project includes an aluminum smelter, high-voltage power lines, reserve energy supply, and roads.

[4] Another consequence of the large amount of silt in the water is that the reservoir will fill up in around 300 years. This makes the claim that the energy produced by Kárahnjúkar project is renewable, questionable. But is the source which Kárahnjúkar project uses any more renewable than, say, the source which an oil fuelled generator uses? The source is, of course, renewable in the sense that the river will continue to run after the reservoir has filled up, but it will no longer be a source for the production of electricity comparable to what it is today. Moreover, although the production of electricity in Kárahnjúkar project does not yield greenhouse gases, its impact on nature is profound and irreversible.

[5] Mark Lynas discusses the project in "Damned Nation" in *The Ecologist* (Dec 2003/Jan 2004), on-line at: http://www.natturuverndarsamtok.is/news.asp?ID=149. It is also discussed in "Power Driven" in *The Guardian*, November 29th 2003. On-line at: http://www.guardian.co.uk/weekend/story/ 0,3605,1094541,00.html (Retrieved Decembere 10th 2003) The latter article promted a response by Fridrik Sophusson, the Managing Director of Landsvirkjun, which can be found at:

The decision to go forward with any project in Iceland that may have considerable environmental impact must be taken after an assessment that involves both the work of experts and public input. The assessment process can be divided into four steps. First, the project undertaker must publish a report on the environmental impact and the economic benefits of the project. Second, this report is subject to expert and public criticism. Third, the State Planning Agency, which is an expert institution, has to evaluate the report and approve or reject it on the basis of this criticism. Fourth, the Minister of Environment has the last word in this procedure and is not obliged to follow the ruling by the State Planning Agency. In short, the project undertaker must make a case for the project, it is subjected to expert and public criticism, and the final decision is in the hands of a democratically elected person. In many ways, this looks like an admirable procedure. In the case of the Kárahnjúkar project, the State Planning Agency rejected the proposal made by Landsvirkjun, the National Power Company. The Minister of Environment, Ms. Siv Fridleifsdóttir, revised this ruling and issued a permit for Landsvirkjun to go ahead pending minor amendments.

The decision by the Minister of Environment has been criticized for being undemocratic. But why should one complain that the decision was *undemocratic* rather than unfortunate, short sighted, or economically unsound? In defense of the minister it has been pointed out that procedural standards were met and that a decision like this should, in the end, be made by a democratically elected person rather than experts who are not responsible to the general public. The minister is democratically elected, is accountable to parliament and represents a majority in the parliament which is itself democratically elected.

Criticizing the decision taken by the Minister of Environment as *undemocratic* creates problems to the opponents of the Kárahnjúkar project. The alternative seems to be to have decisions of this sort taken by expert institution, similar to decisions about speed limits on highways, which are taken by engineers and safety experts? Such decisions are intended to serve public interest but the fact that the public is not involved in the decision-making process does not undermine their legitimacy. However, leaving major decisions about environmental issues at the hands of experts might imply that the view, that such decisions should be made in a democratic way, had been abandoned. Critics of the Minister of Environment have insisted that the decision procedure should be open to the general public and, also, that the final decision should be subject to democratic criticism. The final decision should then be left to a democratically elected person who can reverse any decision made by the State Planning Agency. This tension between relying on expert institutions, on the one hand,

http://www.lv.is/files/2003_12_8_FS_Bref_Guardian_031203.pdf (Retrieved December 10th 2003).

and insisting on direct democratic responsibility, on the other, is the *problem of institutional decisions*.

Local preferences and distant benefits

The mismatch problem stems from different spatial and temporal frames, namely the long range of environmental effects and the local focus of democratic decision. This becomes clear if we consider issues like pollution. It is clear that we are constantly polluting; we drive cars, we produce household waste, and we eat agricultural products which are produced using artificial fertilizers. Is this pollution harmful? There is too much pollution, but since there are so many sources of pollution it isn't clear that the factors just mentioned are the ones responsible. Even if we agree that these factors are somewhat to blame it is not clear what should be done; the relation between possible action and preferred consequences is too loose. Consequently, it is difficult to form definite preferences and to reach a general consensus concerning environmental issues.

Democratic decisions, on the other hand, have a narrow focus. What triggers the need for a democratic decision is usually something pressing and present: lack of employment, a hope for tax reduction, a need for better roads etc. Definite preferences are easily discernible in these cases. Furthermore, the relationship between available action and possible satisfaction of preferences is relatively tight.

It is relatively easy for people to have definite preferences concerning issues whose focus is narrow. As the space of effects becomes larger and less concrete, as is often the case in environmental issues, determining preferences become more difficult. Moreover, environmental issues may demand a time frame extending far beyond that of democratic decision-making. A hydroelectric power project supplying energy to an aluminum smelter may require decades of research,[6] whereas decisions as to whether to build an aluminum smelter are taken within a short time span based on market conditions and cyclical changes in the metal industry. Hence, environmental values may be strong in theory, yet they turn out to be weak in practice. I call this the *mismatch problem*.

Global environmental issues vs. local democratic decisions

The basic source of the problem of external enforcement is similar to that of the previous one, namely mismatch between democratic decisions and environmental values. The mismatch that gives rise to the third problem is a simple coordination problem: Responding effectively to environmental problems requires coordination among many parties (nations, states, counties, municipal townships etc.). It is pointless for Iceland to keep its waste out of the ocean if the

[6] In a volcanic area like Iceland the time frame might even be longer since the natural cycles extend over decades or centuries rather than years.

neighboring countries in the North Atlantic continue to dump toxic wastes into it. Likewise, a reduction of the emission of greenhouse gasses in Europe has limited benefits if the United States do not do so likewise. A single nation might, of course, adopt stricter environmental standards and hope that others followed in the path, but it is unlikely that any nation will take costly initiative unless it has some guarantee that others will follow.

This is a well-known problem, and so is its resolution. The solution of a coordination problem among different nations requires international institutions, such as the European Community or the United Nations, which can define and enforce standards, initiate collective programs, create markets for pollution quotas, reward positive behavior, etc.[7] If there are institutions that possess such executive power, the coordination problem can be solved. The solution, however, creates a different problem: Subjecting decisions about environmental issues to non-local institutions, means that important local decisions will be affected by factors outside the reach of those most directly affected. This seems to militate against the idea of democracy.

Let me explain the last point in more concrete terms. Sustained habitation of regions, continued rural habitation, expansion of cities, or ways of living may conflict with policies and programs that are initiated by international institutions as a response to some environmental issues. If environmental issues are decided by the EC or the UN, or other non-local institutions, these institutions may constrain both what goals people can pursue and what means people can use in pursuit thereof. People will feel that *others* are messing with *their own* lives. This intrusion may undermine their sense of participating in a democratic society. They will feel that all preferences are not given equal consideration; some preferences (the "green" preferences) are given disproportionate weight while others are not even considered. Furthermore, what can be subjected to democratic decision – i.e. what is on the agenda – will be determined without any direct participation by the voters.

It may be difficult to place certain issues on the local agenda because that might violate international agreements. Can people destroy the wetlands in their backyard even if they are of "no use"? The goals may be perfectly legitimate and far from being subject to international norms and regulations, say securing full employment in a remote region, yet there may be means towards achieving these goals which are illegitimate according to international agreements despite local political advantages. Lack of employment might, e.g., not be solved by building a hydroelectric power station and an aluminium smelter (and roads, power lines etc.), because it would require flooding areas protected by international

[7] A good example of an attempt to respond responsibly to global environmental issues are the United Nations Framework Convention on Climate Change from 1992 and the Kyoto Protocol from 1997.

agreements. Therefore, even if the majority of voters were willing to achieve full employment by abandoning the conservation of that area, still, any means of achieving full employment by severely damaging the area would be illegitimate.

Giving preferences unequal consideration and determining, without direct input from voters, what issues can legitimately be pursued is in conflict with people's sense of living in a democratic society. It seems that democracy favors people's preferences at the expense of the environment, while non-local norms and regulations may favor the environment at the expense of people's preferences. The end result may be an erosion of people's sense of living in a democratic society. This is the *problem of external enforcement*.

These three characteristic problems seem to imply that a concern for the environment requires a compromise in our demand for democracy. But is this conflict more apparent than real? Can an appropriate conception of democracy perhaps provide a solution?

2. Democracy as aggregation of preferences

In *Democracy and Its Critics* Robert A. Dahl argues for a conception of democracy that he believes is the best one can hope for given the circumstances of modern nation states.[8] This conception of democracy is realistic insofar that it approximates what are commonly considered distinctive features of democracy. But, according to this conception, there is a fundamental conflict between environmental values and democracy.

Dahl suggests four criteria for democratic procedure concerning effective participation, voting equality, enlightened understanding and control of the local political agenda. His idea is that a procedure that meets these criteria is democratic and a state that is governed according to it is as democratic as possible. The four criteria are:

(1) Effective Participation: Throughout the process of making binding decisions, citizens ought to have an adequate opportunity, and an equal opportunity, for expressing their preferences as to the final outcome. They must have adequate and equal opportunities for placing questions on the agenda and for expressing reasons for endorsing one outcome rather than another. (*DC* 109)

(2) Voting Equality at the Decisive Stage: At the decisive stage of collective decisions, each citizen must be ensured an equal opportunity to express a choice that will be counted as equal in weight to the choice expressed by any other

[8] Robert A. Dahl, *Democracy and Its Critics*, Yale University Press, 1989. Hereafter referred to as '*DC*'.

citizen. In determining outcomes at the decisive stage, these choices, and only these choices, must be taken into account. (*DC* 109)

(3) Enlightened Understanding: Each citizen ought to have adequate and equal opportunity for discovering and validating (within the time permitted by the need for decision[9]) the choices on the matter to be decided that would best serve the citizen's interests. (*DC* 112)

(4) Control of the Agenda: The demos [i.e. those who have the right to vote] must have the exclusive opportunity to decide how matters are to be placed on the agenda of matters that are to be decided by means of the democratic process. (*DC* 113)

Dahl's justification for his criteria consists of three components: (i) an idea of intrinsic equality; (ii) a presumption of personal autonomy; and (iii) what he calls the Strong Principle of Equality.

Dahl mentions six possible interpretations of the idea of intrinsic equality: (1) No one is naturally entitled to subject another to his will or authority,[10] (2) no person is intrinsically superior to another, (3) intrinsic equality consists in the capacity for having a conception of the good and a sense of justice, (4) intrinsic equality means that the good or interests of each person must be given equal consideration, (5) intrinsic equality follows from the fact that we are all equally God's children and, (6) intrinsic equality means that happiness of everybody must be counted in exactly the same units as the happiness of everybody else. Dahl opts for the fourth interpretation:

The aspect that seems to me most relevant to the democratic process is expressed in the Principle of Equal Consideration of Interests. ... To begin with, the principle implies that during a process of collective decision making, the interests of every person who is subject to the decision must (within the limits of feasibility) be accurately interpreted and made known. (*DC* 86)

The idea of intrinsic equality does not suffice to justify democracy, but Dahl also accepts what he calls the *Presumption of Personal Autonomy*.

This is the assumption that no person is, in general, more likely than yourself to be a better judge of your own good or interests or to act to bring it about. (*DC* 99)

[9] This becomes especially relevant when the need for a decision is driven by market cycles while the environmental feasibility can only be estimated by research over extended period of time, as I mention above in relation to the mismatch problem.

[10] Her attributes this idea to John Locke

Given these two components Dahl arrives at the following principle which he calls the *Strong Principle of Equality*.

All members [of the association in question] are sufficiently well qualified, taken all around, to participate in making the collective decision binding on the association that significantly affect their good or interests. In any case, none are so definitely better qualified than the others that they should be entrusted with making the collective and binding decisions. (DC 98)

Dahl claims that by adopting The Strong Principle of Equality one accepts, in effect, the democratic procedure as the best way to make binding decisions. (*DC* 105)

Dahl outlines an aggregative conception of democracy according to which the main function of a democratic procedure is to pool citizens' preferences together and take binding decisions according to the result. The criteria that he specifies are meant to guarantee that the democratic procedure is free from coercion and unjustified elimination of people's preferences, that the final decision is enlightened and that the agenda is controlled by those affected.[11] There are two features of an aggregative conception of democracy which I want to stress. First, it focuses on preferences or interests. The idea of intrinsic equality and the strong principle of equality both focus on the preferences or interests that voters may have and the whole procedure is primarily a mechanism for measuring the preferences of voters. Second, according to the aggregative conception, democracy is primarily about voting.

3. From aggregative to deliberative democracy

The deliberative conception of democracy differs from the aggregative one in three ways. First, it does not take people's preferences as fixed but as something which may change during the democratic procedure. Second, the main emphasis is not on voting but on discussion and deliberation. Voting, when necessary, is just a final stage in a complicated procedure and not something which the whole democratic procedure is geared towards. Third, what counts as an acceptable democratic decision is not just what free and unconstrained voting yields, it must also meet various other standards having to do with peoples' rights and liberties.

It may be instructive to consider again Dahl's construal of the aggregative conception of democracy, for there are certain difficulties that it encounters which point to a more deliberative conception. In this section I will bring out

[11] Although international affairs are, to some extent, decided in a democratic setting the agenda is to a large extent set by the strong, often the United States. The agenda is, therefore, not set by the demos (those who have the right to vote) but by one member of the demos. This violates criterion 4.

some of these difficulties and, then, explain how a deliberative conception avoids them. In the next section I will go on to look at the three problems which I outlined at the beginning from the point of view of deliberative democracy.

The first of Dahl's four criteria for democratic procedure lists three conditions for effective participation: citizens ought to have adequate and equal opportunities (i) for expressing their preferences, (ii) for placing questions on the political agenda, and (iii) for expressing reasons for endorsing one outcome rather than another. The third condition has little force on its own. Why people have certain preferences does not count in the final outcome, nor is there anything in the criteria which says that a procedure would be less democratic if these reasons were ignored. Moreover, this condition is not derivable from the justifying principle mentioned above. This is so not because the requirement as such is foreign to democratic procedure – it should be important – but because it does not fit well into the aggregative conception. To see this clearer, consider what Dahl says in relating the first criterion to its underlying principles:

To deny any citizen adequate opportunities for effective participation means that because their preferences are unknown or incorrectly perceived, they cannot be taken into account. But not to take their preferences as to the final outcome equally into account is to reject the principle of equal consideration of interests. (*DC* 109)

There is nothing here which explains why it is important that citizens can express their reasons for having different preferences. Effective participation means that people's *preferences* get known, not their reasons for having those preferences. The ordinary person participates in a democratic procedure by casting her vote according to her preferences, and effective participation means that she understands what options best fit her preferences and she casts her vote so that it gets counted.

Dahl might argue that if the citizens were not granted equal opportunity to express their reasons for endorsing a specific outcome, their influence on the political agenda, or even on the final decision, might be unequal. If someone has a better opportunity to express her reasons for favoring a particular outcome, then she is in a privileged position to argue that some interests, that may be widely shared, are best served by this particular outcome. This would make her influence on the final outcome greater than the influence of others and, thereby, somehow violate the principle that all interests be given equal consideration as Dahl's idea of intrinsic equality demands. As appealing as this argument may be, it militates against Dahl's conception of democracy rather than supporting it. This argument undermines the idea of democratic procedure as a pooling of preferences, and supports the idea that democratic procedure is a procedure in which preferences are formed and transformed. This argument also undermines

the aggregative conception in another way. It moves the emphasis from voting to the discussion leading up to the final voting.

These faults of the aggregative conception are not specific to Dahl's formulation of it. They get at the heart of any conception of democracy that is static in a similar way, i.e. any conception that treats people's preferences as something given, and sees the basic function of democratic procedure as gathering these preferences together (by voting). But how shall we regard democratic procedure once we give up the idea that democracy is primarily a pooling of preferences by means of voting? Two elements need to be reconsidered. First, we need to reconsider the underlying principle of equality; instead of Dahl's idea of intrinsic equality which demands equal consideration of interests or preferences, we should have a principle which demands equal respect for persons. Second, we must reconsider the corresponding conceptions of political legitimacy and political justification. According to Dahl's aggregative conception of democracy, political justification is a formal requirement. His four criteria above define formal conditions for a political justification for binding collective decisions: a collective binding decision is justifiable, and thereby legitimate, just in case it is taken in accordance with the criteria for democratic procedure, and it does not violate the law or constitution. Once the focus of democratic theory shifts from preferences or interests to persons, the conception of political justification will, in part, become substantive and not remain formal.

The difference between a formal conception of political justification and a substantial one, is illustrated in cases where widely held trivial preferences are in conflict with vital interests of a minority. The aggregative conception of democracy lacks the resources necessary to assign different weights to preferences concerning matters such as opening hours of stores, on the one hand, and preferences concerning people's vital interests or basic rights, say religious liberty, on the other. An atheist might take no interest at all in religious liberty and, therefore, have no preferences one way or another when it comes to questions about religious liberty. Moreover, if the majority preferred to have no religion practiced in the society a referendum could be held the outcome of which might mean serious restriction of religious liberty. That might be perfectly democratic according to the aggregative conception and, yet, it would violate a widely held intuition about basic human rights.

The conception of political justification that we get from the aggregative conception is too permissive; too much can legitimately be done. According to the aggregative conception, democratic procedure is primarily about voting, such voting may yield a winner and a loser and there is nothing within the democratic standards which prevents the winner from violating certain non-political rights, such as religious rights, of those who lose. In most democratic countries various non-political rights are protected, but from the point of view of the aggregative conception, their protection is not part of democratic procedure.

The protection of such rights is seen (from the aggregative point of view) as an external hindrance to authoritative action, be it an action driven by a simple majority vote or the action of an elected individual. If such rights are protected by a constitution, the hindrance may be too difficult to overcome. If the rights are only protected by ordinary law or even by rules of prudence, then these will only make things cumbersome. Rights will be curbed when it is found to be worth the effort.

The starting point for a deliberative conception of democracy is a conception of political justification that is both procedural and substantial. The proponents of deliberative democracy have mainly taken their cue from two sources: Jürgen Habermas's discursive ethics and John Rawls's theory of justice, in particular his notion of public reason.[12] Rawls's notion of public reason is based, among other things, on his idea that the state is a cooperative venue for the citizens to set themselves goals and to work towards them. It is a cooperative venue for the pursuit of happiness. But understanding the role of the state in this way, raises questions about the legitimacy of state action in general, and its monopoly on the use of force in particular. Rawls believes that if we are reasonable people, we will recognize that we need to take collective, binding decisions concerning various issues, and such decisions will favor some people's preferences at the expense of others'. But any decision, which goes against someone's basic rights, sense of self-worth or basic philosophy of life, cannot be seen, by the individual in question, as an action of a state which is a cooperative venue for his pursuit of happiness. Therefore, if state action violates the basic values of reasonable persons, it is not a legitimate action, no matter *how* this action has come about, i.e. no matter what the procedure leading up to the action has been like.[13]

The conception of political legitimacy applies not only to authoritative action but also to the justification for such an action. If a state action can only be justified on grounds which are incompatible with people's basic values and rights, this action will be deemed illegitimate irrespective of its consequences. A ban on smoking in public places justified in terms of a lesser worth of smokers would be illegitimate, whether or not such a ban was, in itself, in violation of any rights or fundamental values. The illegitimacy of such a ban derives from an unacceptable justification for it. However, a similar ban justified in terms of health risk towards non-smokers would be legitimate. This example illustrates

[12] See for instance Cohen's papers "Deliberation and democratic legitimacy" and "Procedure and substance in deliberative democracy", reprinted in *Deliberative Democracy: Essays on Reason and Politics*, James Bohman and William Rehg eds., MIT Press 1997.

[13] The difference between a formal conception of political justification and a more substantial conception was reflected in recent debates concerning a centralized and privately operated health sector database in Iceland. See for instance Skúli Sigurðsson, "Yin-Yang Genetics, or the HSD deCODE Controversy", *New Genetics and Society*, 20:2 (August 2001), 103-117.

that the deliberative conception of democracy puts severe constraints on actions by the state or a parliamentary majority and on the grounds on which such actions are justified. According to the aggregative conception, majority vote is usually a sufficiently good justification for action, but according to the deliberative one, people's basic rights and fundamental values are assigned such weight that a majority vote may not suffice as a justification for action.

According to the deliberative conception of democracy, the requirement of political justification makes substantial demands concerning people's rights and liberty and ultimately their sense of self-worth. This means that the protection of various non-political rights, such as religious rights, is inherent in the deliberative conception of democracy. It is not an external hindrance to democratic decisions as seen from the aggregative viewpoint.

4. Deliberative democracy and environmental issues

I began this paper by discussing three problems which seemed to indicate that there was a fundamental conflict between democracy and environmental values, namely:

(1) The problem of institutional decisions.

(2) The mismatch problem.

(3) The problem of external enforcement.

Now I return to these problems. I will argue that there is no conflict as long as democracy is understood in a deliberative manner.

The problem of institutional decisions was illustrated with reference to recent events in Iceland. The Minister of Environment has been criticized for being undemocratic when she reversed a decision by the State Planning Agency. Should the State Planning Agency have had the last word? Would the final decision have been more democratic had the minister followed the decision by the Planning Agency? If the State Planning Agency would have had the last word on the matter, the decision would have been left at the hands of the technical experts. And that is generally held to be undemocratic.

If the decision of the Minister of Environment is interpreted in the light of an aggregative conception of democracy one cannot complain that it was undemocratic. She represents a majority view, her party is a member of a majority government, and she can do whatever this majority allows her to do, so long as she does not violate the law, constitution, or international agreements.[14]

[14] In the report substantiating the final ruling by the Minister of Environment we can see this attitude quite clearly: "In the discussion of the ministry [of environment] about the impact of

Yet notice that procedural standards that must be met prior to a final decision can be taken merely to define formal conditions for political legitimacy. The specific content of public and expert criticism is irrelevant.

The situation is very different if we look at the ministerial decision from a deliberative perspective. One might insist that the role of the State Planning Agency is not only to pass expert judgment on the feasibility of the project, but to play a more constructive role in structuring the public debate about its feasibility. Furthermore, when the minister asks herself whether she should uphold or revise the ruling by the State Planning Agency, she must ask herself whether her decision will be in accordance with public reason. Is she, for instance, regarding all citizens as free and equal and, in particular, are all persons being shown equal respect? The legal and procedural standards that must be met do continue to specify formal aspects of a democratic procedure. But a whole new dimension is added which brings in substantial consideration about the rights, fundamental values and philosophies of life of those affected. A decision which ignores this dimension, or important aspects of it (as was the case in the Kárahnjúkar project), cannot be democratic in the deliberative sense irrespective of whether the person making the decision was democratically elected, has a majority in a parliament behind her, etc.

The mismatch problem derives from the fact that people may have definite preferences concerning local issues, but as issues recede into the distance, either because they concern remote regions or consequences that will only become relevant decades later, preference orderings becomes much trickier. This leads to the conclusion that trivial local preferences may outweigh fundamental preferences in matters more distant and more elusive.

Solving the mismatch problem seems to require giving certain interests and preferences more weight than others by constructing barriers that are not part of democratic procedure in the aggregative sense, i.e. hindrances that constrain what issues can be put on the local political agenda, what political and social rights must be upheld, etc. However, if the situation is viewed from the deliberative perspective, assigning different weight to different interests and preferences need not be foreign to a democratic procedure but may follow from the requirement that persons should be shown equal respect. In particular, showing special concern for the interests of future generations need not be

the project on the protected areas, nothing has appeared which indicates that the project violates laws, regulations or international agreements, and there is, therefore, no reason, because of this impact, to go against the project." *Úrskurður*, [Ruling] Ministry of Environment, December 20th, 2001, (UMH01080004/10-02-0601), p. 99. The original text can be found, in Icelandic, at http://www.karahnjukar.is/files/ 2002_9_27_urskurdur_ur_heild.pdf (Retrieved December 28, 2003).

guaranteed by factors that lie outside the democratic procedure. Showing people equal respect will *directly* involve future generations in so far as they will be affected by the decisions in question. Moreover, showing individuals belonging to the present generation equal respect may require *indirect* concern for future generations, since individuals living now may derive their meaning of life from the thought that they may have children one day, and these children may, in turn, have children on their own. In the deliberative framework there are means to take such distant values into account.[15] This is particularly relevant in the case of the environment, especially when it comes to unspoiled nature which is generally regarded as an important source of a meaning of life while being possibly, at the same time, an important provider of raw materials for industry which is driven by the immediate here and now.

The problem of external enforcement derives from a typical coordination problem. Responding effectively to environmental issues requires coordination among different regions (countries, states, counties, municipal townships etc.). Everyone would be better off if collectively everyone took relevant action, but there is no guarantee that the others will do so. One way of solving such a problem is to have external enforcement secure the appropriate coordination among the relevant parties. So, theoretically, the coordination problem can readily be solved. But the solution seems to entail that the issues in question will not be decided by a democratic decision by the relevant parties. The question now is whether solving a coordination problem by external enforcement must, inevitably, entail sacrificing democracy. In order to understand what is at stake here, it may be instructive to consider how a standard coordination problem can be solved. Having done that we will be in a better position to appreciate why the means that we might have at our disposal to solve a real-life coordination problem need not lead to sacrificing democracy.

The simplest kind of a coordination problem is a prisoners' dilemma of the following kind. A and B are two criminals who are being interrogated by the police. They committed a crime for which they would get 10 years in prison if they would confess. However, if A confesses but B does not, A is let free while B will get 20 years in prison. If both confess, they get 10 years in prison each. If neither confesses, the police will charge them for jaywalking for which they get 2 years in prison. The situation can be represented by a matrix.

[15] A recent study actually indicates that having people evaluate environmental goods in small groups in a deliberative setting tends to result in a higher value assigned to environmental goods than when people value the same things in isolation. (M.A. Wilson and R.B. Howarth, "Discourse-based valuation of ecosystem services: establishing fair outcomes through group deliberation", *Ecological Economics*, 41(2002) 431–443).

	B confesses	**B does not confess**
A confesses	10 / 10	0 / 20
A does not confess	20 / 0	2 / 2

The dominant strategy is to confess, since one cannot be certain that the other will keep his mouth shut. This leaves the prisoners with the outcome depicted in the top left corner; each gets 10 years in prison, whereas had neither confessed, they would have gotten away with 2 years each in prison. What this dilemma brings out very sharply is that individual rationality in a situation bereft of trust leads to a conclusion that is worse for everyone. We might say that the individual preferences rule at the expense of the individuals.

One might alter the picture so as to have the prisoner not confess and, thereby, just get 2 years each. One could punish confession, i.e. making the option depicted in the top left corner worse than the other outcomes whereby the dominant strategy would be not to confess. This would lead to the outcome depicted in the bottom left corner; each gets 2 years.

It is striking that a slight change in the prisoners' preferences also leads to the result that each gets 2 years. Suppose each prisoner would prefer to confess if he felt the other would let him down by confessing, but would not confess if he thought that the other one would not. Call this an "assurance game", or AG for short, and the corresponding preferences AG preferences. Two differences between AG and a prisoners' dilemma are particularly interesting: in the former a mutual contract of non-confession does not need any enforcement, and someone who has preferences as in the prisoners' dilemma, is better off if he acts as if his preferences were AG preferences, provided the other acts in the same way.[16]

The upshot is this: To solve the coordination problem it suffices that people have AG preferences or that they act as if they have AG preferences and that there be a "mutual agreement of non-confession" among people. If people have or act as if they have AG preferences, a mutual agreement will be easily come by since such an agreement needs no enforcement.

The lesson of the ideal case for the more complex real-life situation is that we need to shift from prisoners'-dilemma preferences to AG preferences. Hence, we might raise the question: When is collective action guided by AG preferences? What condition must be prevailing in a society so that people will have AG

[16] The idea of an assurance game comes from a paper by Amartya Sen, "Choice, orderings and morality", *Practical Reason*, S. Körner ed., Blackwell 1974, reprinted in *Choice, Welfare and Measurement*, MIT Press, 1982.

preferences rather than prisoners'-dilemma preferences? What is needed is a society which satisfies three conditions: (i) It is a cooperative venue for the citizens, (ii) it is regarded as such by the citizens, and (iii) there is a common knowledge in the society that the citizens regard it as a cooperative venue. It is a society based on trust among its members. This brings us back to the basic assumption on which the deliberative conception of democracy is based. Our daily life is a constant playing of AG rather than prisoners' dilemmas. Driving around town or buying groceries at the store depends on trust. The fact that our life is a playing of AG rather than prisoners' dilemmas is what makes it possible for us to form preferences and act on them.

The problem in the prisoners' dilemma is that each prisoner prefers to get away with 2 years in prison, but the circumstances forbid them to act on these preferences. The only reliable thing they can do is to confess and end up with 10 years. The AG example indicates that there are more ways to solve the coordination problem (and thereby get the preferred conclusion, i.e. 2 years for each) than having an external authority enforce certain choices (non-confession) or punish others (confession). The coordination problem can also be solved by having an external authority create a forum where the relationship between people's preferences and viable action is more like AG than prisoners' dilemmas.

5. Concluding remarks

The three characteristic problems mentioned at the beginning – the problem of institutional decision, the mismatch problem, and the problem of external enforcement – do not support the view that there is a fundamental conflict between environmental values and democracy. Why people have thought so lies partly in an unacceptable conception of democracy – the aggregative one. Once democracy is seen as a deliberative procedure based on the assumption that the state is a cooperative venue for the pursuit of happiness, the appearance of such conflict vanishes.

This is not to deny that it is anything but easy to bring environmental decision making under deliberative democratic governance. What is needed is a mixture of institutions, customs, and traditions. To achieve that is a difficult process. Their role of these institutions is to bring about justice with respect to environmental issues. Recall Rawl's notion of a well ordered society. A well-ordered society is one which is

… designed to advance the good of its members and effectively regulated by a public conception of justice. Thus it is a society in which everyone accepts and

knows that the other accept the same principles of justice, and the basic social institutions satisfy and are known to satisfy these principles.[17]

Actions in a well-ordered society are equivalent to playing AG. As solving the problem of external enforcement requires people to play AG rather than prisoners' dilemmas, we can see that to solve the problem it is sufficient to well-order the community of the relevant parties when it comes to environmental issues. Moreover, the well-ordering of any society, local or international, is an essential requirement for democracy.[18] From the viewpoint of deliberative democracy, the well-ordering of the international society will be seen as an attempt to create a forum where environmental issues can be discussed and preferences with respect to such issues can be (trans)formed. Bringing environmental issues under democratic governance is a task that we can pursue, and should.[19]

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[17] John Rawls, *A Theory of Justice*, 2nd edition, Harvard University Press 1999, chapter VIII, §69, p. 397.

[18] A well-ordered society might be necessary for democratic governance but it is surely not sufficient. What is needed additionally is an open question and it may turn out that global environmental issues cannot be brought under democratic governance. The reason would, however, not simply be the coordination problem.

[19] I thank Skúli Sigurdsson and Vilhjálmur Árnason for helpful comments on earlier drafts.

Nanotechnologies: a Risk to the Environment & Humans?

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Abstract

'Nanotechnology' is a label used to designate a group of scientific and technological research programs that work with --and exploit-- specific properties that arise from structuring matter at the nanometre scale (one nanometre is one millionth of a millimetre). These nano-scale properties may prove to be very useful for the development of technological innovations in different industrial fields. Some innovations based on nanotechnologies are already in the market and many more will be introduced in the near future. This paper discusses the most significant risks that nanotechnological developments will pose to society and the environment from a bioethical point of view. These include risks to human health and safety, energy and the local and global environment; in addition, there is a risk that these innovations may lead to a 'nano-divide' (an increase in the gulf between rich and poor) and even the modification of human nature itself. Critically examining the limits of conventional approaches to these issues will open up new perspectives in order to reach agreements that allow us to live in a shared world.

Key words: *ethics, sustainability, responsibility, power, justice, human future*

Introduction

For military, political and economics reasons, many very smart minds spend a lot of time and energy thinking about the future. Unfortunately, most of these 'analysts' have come to the conclusion that our world is in crisis in one way or another. They warn us about political instability, the breakdown of traditional family and social values, the deterioration and mistrust of the democratic system, the spread of war and terrorism, the threat of nuclear weapons, the lack of water, the danger of food poisoned by a combination of chemicals or that has been genetically modified, the 'clash of civilizations', unrelenting waves of immigration, long-lasting famines or even mass starvation, the out of control growth of the world population, the brutal fight for scarce natural resources, the extinction of different species (loss of biodiversity), the spread of epidemics (pandemic), the fact that we are running out of fossil fuels, natural catastrophes (floods, fires, landslides, etc.) that are caused or aggravated by human activity, global warming, technological accidents such as oil spills, airplane crashes, collapsing buildings and bridges, nuclear accidents and all kinds of side effects caused by using different technologies.

Although the fact that our planet is in crisis seems to be the consensus, there are extremely different attitudes towards the breathtaking changes that are hurtling us toward the future. Basically we can point to two polarised points of view (although many intermediate points of view lie in between these extremes). On the one hand, some people believe that despite all of our problems we should stop trying to change things right now and relinquish any means of significantly altering the current situation, because in the end we are just going to make matters worse. For example, some feel we should stop searching for a cure for genetic disease because they fear that genetic manipulation may eventually result in a profound, irreversible modification of the human genome.

Yet because people who think in this manner also understand that our current situation is untenable they often look to the past for answers, sometimes advocating a return to the rural life of our ancestors. They might argue that because we are running out of cheap oil we cannot continue filling our gas tanks, travelling by plane or transporting the many things we are used to buying. Instead we must sharply cut our energy consumption and return to a society based on small communities that obtain their food through traditional agricultural practices. In this new 'old' society we would rediscover the skills of craftsmanship in order to produce the goods we need for this simplified lifestyle. There are even some people who propose returning to the "primitive" way of life of our hunter-gatherer ancestors!

On the other extreme we find the 'technophiles', i.e. technology fans. They may also be pessimistic about the global situation, but they put their undying faith in scientific research and technological development as a clear expression of the human will to survive. This faith in the power of technology makes them very

confident that humanity –or at least part of it— will prosper in the future. In their view the history of humanity is a 'history of overcoming' that will go on indefinitely. Greater knowledge and technical skills will allow human beings to continue to master nature. As for the problems caused by the very development of more and more complex technologies, we are told that as each problem is detected and analysed an appropriate technological 'fix' will be discovered for each of them. Therefore, when conventional energy resources are no longer available we will simply find new ones, like hydrogen cells. If human beings are in danger of extinction for biological reasons, we will 'improve evolution' by radically modifying the human physical configuration. If the biosphere is about to be destroyed by a wayward asteroid we can always colonise other planets. From the ashes of our old planet, a new, better humanity will be born. We will abandon 'mother Earth' like a child that becomes an adult and leaves home to live his/her own life.

Technophiles believe that we should not be afraid of taking risks because this has always being part of our life as individuals and as members of the species. What we have to do is to use technology intensively and extensively when 'required'… and technology is and almost always will be required.

This is the present landscape: we are in crisis, and some feel that in order to avoid an apocalyptic scenario we must severely curtail the use of high-technology (and its associated scientific knowledge); on the other hand, technophiles believe that we should have the courage to enthusiastically embrace technology to remedy our current crisis and to shape the future as we please.

This is where nanotechnology enters.

The coming age of nanotechnology

"Nanotechnology" is a convenient catch-all term used to designate a vast and heterogeneous cluster of scientific and technological research programs and projects.[1] What they have in common is that they analyze, manipulate, design, and produce structures, devices and systems exploiting specific properties that arise from structuring matter at an extremely small scale that ranges from 1 to 100 nanometres (one nanometre is one millionth of a millimetre). In the nano-world (the atomic and molecular level) the mechanical, optical, magnetic and electronic properties of materials are very different from those that they have in

[1] In reality, we should use the term 'nanoscience' to describe scientific research of the 'nanoworld', while 'nanotechnology' should refer to the different ways that engineers and technicians apply the knowledge gained from that nanoscientific research. However, the interdisciplinarity of the field and the fact that a great deal of nanoscientific research is specifically geared towards obtaining information to develop technical applications often make it difficult to draw a sharp distinction between these two areas. In any case, such a distinction is secondary to the purposes of our discussion.

the macro-world, for example, a larger relative surface area, or the production of quantum effects, among others. This may be very valuable for the development of technological innovations in different industrial areas. Nano-scale materials, structures, devices and systems can be used to manufacture everything from sunscreen to bicycle parts; from stain-resistant trousers to military battle suits; from medical sensors that flow through the blood stream to energy cells; from devices to detect pollution to self-cleaning and fire resistant crystals; from incredibly strong and light building materials to computer-brain interfaces. In fact, many of these nano innovations are already in the market: nano products are used in crack-resistant paints, fuel cells, batteries, fuel additives, catalysts, computer chips, lasers and lighting, lubricants, integrated circuitry, medical implants, machine ceramics, water purification systems, windows, cosmetics, explosives, disinfectants, abrasives and food additives.

Over the next few years many more products will enter the market thanks to the extraordinary investment being made in research and development in nanotechnology by public and private sectors all over the world. A reliable indicator of the growth of nanotech industrial applications is the steady rise in new patents related to nanotechnological products and systems --there are literally thousands each year.

Acclaimed as the 'scientific and technological revolution of the 21st Century', nanotech 'breakthroughs' will most likely permeate all sectors of production and affect almost all spheres of human life in the near future --around 20 years. This impressive power to transform natural and human-modified environments is derived from the characteristics of nanotechnology. Some of these characteristics are also found in other emerging technologies, some are unique to nanotechnology and some are the result of the convergence of nanotechnology with these other emerging technologies.

Like other new technologies, nanotechnologies are often the result of an extraordinary collaboration between different disciplines. For example, nanomedical research is conducted by teams that include –or collaborate with— physicists, engineers, computer experts, biologists, chemists, medical researchers, etc.

All of these emerging technologies (genetic engineering, computer science, robotics), are potentially 'enabling' and disruptive at the same time (Arnall, 2003, 10). Enabling technologies yield a huge range of very different products that are sometimes radically new. Nanotechnologies fall into this category because they can manipulate individual atoms and molecules. Nanomaterials, systems and devices can potentially be applied in fields such as optics and electronics, information technology, construction, military equipment, chemistry, energy, environmental monitoring, environmental remediation and cleanup, medicine, transport, etc.

But nanotechnology is also disruptive because older technologies will have to be adapted or be displaced and this transition will almost never be smooth. In other words, instead of a gradual substitution of the old for the new, there will be abrupt changes in industrial production that will have enormous economic and social consequences, such as unemployment in traditional sectors or obsolete industries and the generation of new jobs.

A crucial characteristic of nanotechnology is that it allows information technologies, biotechnology, robotics, cognitive sciences and other disciplines to converge. For example, computer-neuronal interfaces are being designed to take advantage of the common electrical features of microchips and neurones that allow them to transmit information. Also nano-biosensors, made of artificial materials and biological elements, are feasible because in the nanometre range some properties of living systems and inanimate matter are compatible. In this way, nanotechnology offers a sort of universal platform to make use of the combined power of different technologies.

Last but not least, nanotechnology is transformative, in the sense that it has the potential to transform all aspects of society: social relations, labour, international economies and institutions (Mehta and Hunt, 2006, 275).

Dealing with nanotech risk

The increasing development of nanotechnology raises concern for a variety of reasons. A useful way to think about the consequences of nanotechnological products for humans and the environment is to conceptualize them as 'risks' (although we'll later see that this approach also has some important drawbacks). There are many different ways of defining risk, but for the purposes of the present discussion, we can simply think of risk as the (negative) consequence of an event, process or action, usually some kind of harm for us, other living beings or the environment. When experts deal with risk, they try to calculate its probability. For example, they speak about the probability of smokers suffering cancer, or the probability of damaging a coastal area due to an oil spill as a result of an oil tanker sinking. Every emerging technology is 'risky business' for its promoters and also for people potentially affected: as insurance companies well know (Allianz-OECD International Futures Programme, 2005).

The future holds many risks for our technological societies. In fact, some say that we are living in 'risk societies' and, as the world becomes more globalised, we are becoming citizens of a 'world risk society' (Beck, 1999).

Of course, nanotechnologies will probably bring about many good things: wonderful materials, medical treatments, and other applications we can hardly imagine today. We do not need to point them out here because the expected benefits of nanotechnology are already highly publicised in the media and the

internet. More importantly, even good things can cause problems in terms of unintended consequences or their uneven distribution. In any case, this is a description of the potential ethical problems of nanotechnologies. Despite the fact that the rest of this paper focuses on the problematic nature of present and future nanotechnological developments, this should not be interpreted as a rejection of them. However, our appraisal of nanotechnologies must not be based (only) on enthusiasm or fear, but also on insight and judgment.

Having said this, we are going to avoid overly general and abstract ethical discourse. Of course, some general ethical principles and recommendations are in order because they can apply not only to nanotech products, but also to any other goods (Sherlock, 2005). For example, it is important to avoid inequality in the access to any good. Principles like human dignity, personal autonomy (and its limits), justice or freedom play a crucial role in the process of developing and applying new nanotech medical treatments and consumer products. Other principles that cannot be relinquished include individual and social responsibility, consent, integrity, privacy and confidentiality, equity, non-discrimination, cultural diversity, pluralism, solidarity, sharing of benefits, protection of future generations, the environment and biodiversity. These principles, among others, are contained in the Universal Declaration on Bioethics and Human Rights (UNESCO, 2005), a valuable initiative of the United Nations Educational, Scientific and Cultural Organization (UNESCO). Yet because the huge variety of actual or foreseen nano innovations each have very different, specific implications, there needs to be a case by case ethical evaluation (Khushf, 2004) that takes into account current socio-economic trends (Hunt, 2006). This is where the interpretation and application of these principles turns into a source of conflict, as we shall see in the examples presented in this paper.

Discussion of risk in nanotechnology is not easy for several reasons, the most crucial being that (a) our knowledge of the properties, behaviour and effects of nano materials is still insufficient; and (b) it is often difficult to distinguish between products that will become a reality sooner or later and other imagined applications that, for good or bad, will remain in the realm of science fiction forever. For instance, experts are still debating the likelihood of the hypothetical end of the world scenario known as 'grey goo', where the runaway self-replication of nano-robots would extend, uncontrolled, all over the world, harming (or destroying) humans and other living beings. Meanwhile, more and more nano products are being commercialised when the tests to determine the toxicity and ecotoxicity of nano particles have not yet been carried out on a much larger scale.

Moreover, due to lack of knowledge or other reasons, it is not always possible to determine the likelihood of an adverse effect, or even the effects that may be produced by an event or activity. This is uncertainty. For example, the

unintended combination of certain chemical substances ('chemical cocktails') present in our daily environment can have negative health effects. Researchers have found a strong link between the use of chemical products in the home and chronic wheezing in young children, a pre-cursor to asthma.

These kinds of risks might not be foreseeable and are very difficult to measure – if at all. Uncertainty is pervasive in our technological world, especially as the processes become more complex. Emerging properties of future nanostructures (e.g. sensors) and systems (e.g. modified biosystems) might cause them to exhibit an unintended behaviour, for example adversely reacting inside the human body or within an ecological system.

Another factor that muddies the discussion of risk is that it is not just a technical matter. Quantitative analyses of risk are useful, but to truly understand and manage risk we cannot leave values, perceptions or even emotions out of the equation.

We are not purely rational beings and, more importantly, we do not wish to be so. While calculations are a relevant part of making some decisions, even when making technical decisions a complex mix of factors intervene during the process. Simply in order to estimate the cost and benefits of introducing an innovative nanotool for diagnosing cancer, decision-makers must take into account the lives of real people, including their beliefs, worries, values, hopes and fears. When a collective choice is made about the appropriateness of a medical diagnosis system or treatment our conception of the health care system itself may be at stake.

This is sometimes addressed in technical literature as an ambiguity problem. Ambiguity refers to the fact that distinct, even conflicting interpretations of the same issue are equally legitimate. People can disagree about how to interpret quantitative results about the probability of suffering some harm. In order to take a decision, data reflecting the probability of being intoxicated when eating a certain food can be interpreted in many ways according to individual beliefs, tastes, priorities and habits. People accept, tolerate or refuse to eat the product taking into account aspects like whether they assume that its good taste compensates for the risk; whether it is fashionable; whether they feel that they have all the relevant information or someone is hiding it; whether it fulfils their desire to experience new things; whether they themselves are assuming the risk or it is being imposed externally; whether they think that their consumption of the product will benefit the 'right' people (poor farmers, members of the community) or only further enrich the executives of a big corporation; whether it goes against their cultural or religious traditions; whether it is approved by their philosophical convictions about nourishment or about the meaning of their own body.

Consider the following case. Research on military nanoapplications is based on the desire of governments to have weapons, battle suits and other war equipment that drastically reduce casualties (and war expenses). However, this 'objective' quantity is subject to opposing interpretations. Saving human life is valuable in and of itself; however, while some lives may be saved others may be taken (not just those of the 'enemy' but also of civilians). In addition, the confidence that there will be few casualties may lead to more war at the expense of searching for pacific means for resolving conflicts. It can also incite endlessly escalating violent responses (including non conventional weapons).

Risky futures

In view of the wide range of applications and the prospects for their implementation, some sort of classification is necessary in order to carry out a risk - and ethical - assessment of nanotech developments. Thus, we can distinguish between:

- Risks similar to those posed by other technologies (Preston, 2005). In the case of biotechnology, biomedical technologies, energy technologies or information technologies, common worries include the fear of creating a socio-economic divide, limitations on the patent of some products, corporate and government abuse, threats to privacy, liability for harm, among others.

- Risks resulting from the above-mentioned convergence between nano- and other technologies. What would happen if a nano-biosensor designed to monitor our health at some point began to behave unpredictably inside our body?

- Finally, risks particular to nanotechnology because of its unique nature. For example, nanoparticles might produce an inflammatory response in human tissues because of their properties (small size, larger surface-to-mass ratio, shape and chemical reactivity).

As stated, a distinction has to be made between nano products according to their expected introduction in the market. Various nanomaterials are already used to manufacture hundreds of goods. There are also nanodevices (such as sensors) used for chemical analysis, environmental control and to monitor health. In addition, it appears that critical developments such as artificial organs and nanocomputers are on the way. Because new products are being obtained every month, it is difficult to say how many of them will be among us in the coming years and how varied and significant to our lives they will be. But if we trust the sounder predictions it seems that other predicted innovations will remain in the realm of dreams (or nightmares!) for a long time, if not forever. Among the candidates to wait a long time before they are –if ever-- accomplished are those exhaustedly debated, complex, self-assembling systems that could be utilized as

'nanobots' to perform a varied class of tasks at a molecular level. As we gradually project our minds into a distant future predictions on impacts become more and more uncertain, entering into that nebulous territory known as 'vision'. But the fervent passion of believers in nanotechnology –and other interested parties-- lead some to worry about catastrophic scenarios at which nanotechies scoff, dismissing them as products of ill-informed or even bad intentioned neo-luddites, that is, people who are anti-technology.[2] However, although they are not probable, these possible dangers are not so easily discarded. Bill Joy, a well-known and respected computer engineer, warned against some of those dangers several years ago (Joy, 2000). Joy is no neo-luddite; in fact, he grew up as a 'trekkie' and has been a lifelong techno-enthusiast. However, he vividly expressed his unease about the increasing development of robotics, genetic engineering, and nanotechnology, which separately or together, could in a not too distant future threaten humanity. The new threat is derived from a characteristic that those technologies will soon share, what Joy called a 'dangerous amplifying factor': self-replication.

Even if these terrible prospects never become real, there are other serious concerns about many possible nanotech developments that deserve exhaustive analysis and wide debate (Susanne et al., 2005, p. 39). To be sure, sensationalistic controversy about futuristic disasters sometimes creates a smokescreen that hides more pressing --in many cases urgent-- issues. We'll get to some of them later, after a few more general comments.

Nanotechnology will probably spread in a way similar to previous technologies such as electrical networks, modern transportation systems, computers and other technologies that have gradually 'entrenched' themselves in every human field to such a degree that to consider 'getting rid' of it is almost tantamount to considering collective suicide. At the same time a small group of individuals, states and corporations monopolize the power to make decisions about how to design, configure, guide or use the innovations. One might wonder what the problem is if, on the whole, their choices make our lives easier, safer, healthier, more

exciting or whatever. But unfortunately it's not that simple. Consider how earlier technologies like atomic energy, fuel-based energy systems and transportation,

[2] In the early 1800s English textile workers destroyed textile machines as a protest against the worsening of their living conditions because of industrialization. They found inspiration in a mythical leader, known as Ned Ludd (or Lud). Hence the name of that social movement (Luddism, Luddites).

high-tech medical treatments, biotech agriculture or computer networks have turned out.

Sometimes products of technological innovations are a complete success and sometimes they are total failures. For the most part, they fall somewhere between those two possibilities. The point is that no matter how successful a product may be trouble of one kind or another will arise. How is that possible? Because successful innovations can be used for dubious social purposes, that is, they can be projected and used to do things that the general public would judge as evil. For example, pharmaceutical companies might focus more on expensive medicines that alleviate chronic ailments, treatments for baldness or other aesthetic nuisances, and less on searching for cures for pandemics that, as far as they are concerned, are not profitable enough. Or consider the case of genetically modified seeds; although they may be resistant to blights and yield a fantastic harvest, at the same time they can limit farming freedom, because the seeds are patented or simply too complicated to deal with without technological aids. In the end, farmers in poor countries are facing the prospect of being ruined because they probably cannot afford high-technology agriculture (to pay for the seeds or have the know-how, abilities and aid to handle such technology). The same thing might happen with new nano-textiles that will make cotton and other natural fibres unnecessary.

Governments and some groups can spy on the activities of private citizens with tiny cameras, transmission detectors, audio bugs, programs that scan your internet activity and a whole arsenal of sophisticated devices. Among other 'improvements', nanotechnology promises to shrink those devices to the point of making them completely invisible. Moreover, enhanced weapons can be used to attack other countries or by terrorists.

On the other hand, inventions that never get beyond the design phase or that do not pass tests will not only damage people's expectations and hopes, but might suppose a significant economic loss to governments and businesses who invest in R&D (research and development). More importantly, they can harm our health, threaten our safety or endanger the environment.

These two possibilities (complete success of evil applications or utter failure of beneficial ones) are very worrisome. However, the history of technology teaches us that these are extreme cases. The majority of products will most likely be just 'good enough' to enter the market, although clearly imperfect, or outright clumsy. Take nanomedical applications, for instance. Hopefully, some of them will be dramatically successful. Many others will have to be discarded because of unacceptable toxicity or other side effects. However, there will be a huge number of products that will be authorized simply because of the heavy investments made in them and their advantages over other options. But unanticipated effects (considerable toxicity and unknown negative side effects)

or less effectiveness than expected will lead to controversy about the legitimacy of those products. And beyond the quality of the products, the problem remains of the growing concentration of power over new technologies in the hands of a reduced group of governments and multinational corporations.

Are we running out of time?

There is yet another possibility that is even more disheartening. Up to now, we have been assuming that the basic conditions for research and development, at least in some countries, will remain the same in the future. Our civilization has to remain stable and similar enough in the future if we are to maintain hope that our enormous problems can be resolved by nanotechnology or by some still unimagined technologies. This is because technical research and development can only be carried out in conditions that would not exist if humanity were fighting for survival every day. But what if the solutions simply do not come in time? We are sliding faster and faster down a slippery slope towards a global crisis. This is absolutely certain, not a "prophecy". Even if some problems such as the population explosion or the depletion of the ozone layer are seen (at least by some experts) on the way to be solved, the remaining challenges are so numerous and so overwhelming that maybe solutions will simply come too late. Consider global warming and the inevitable decline of fossil energy. Of course scientists and engineers are studying the way to resolve these problems or at least control them. They are proposing some solutions that could be put in practice immediately, but that need time to be effective, must to be combined with others, or are not yet sufficiently supported by political, economic or other forces. Other answers to those problems have already been given but that only will be feasible within several years. In the meantime, if energy becomes so expensive that it eventually becomes a luxury, if temperatures rise, significantly altering the regional climate equilibrium, then internal conflicts, wars for better territories and scarce resources and other destructive effects will make scientific and technologic activities a thing of the past, a blurry memory of the 'good old times'. We may be at the threshold of a new paradise, but if we fall just short it will all amount to nothing.

There is a huge amount of risk issues and ethical implications for the future raised by nanotechnological development.[3] The rest of this paper will focus on four areas of environmental and bioethical importance:

- Health and safety
- Environment

[3] These implications are being discussed in academic and non-academic settings all over the world. For a recent overview see Hunt and Mehta, eds. 2006.

- The 'nanodivide'
- Human nature

This list is not exhaustive, but mainly designed –together with the examples scattered throughout the text-- to provide the reader with a brief sketch of some relevant concerns about nanotechnologies as they 'spread over' society and the environment.

Health and safety

Perhaps the most obvious issues to address are those concerning the security and safety of people. Alarms have gone off about possible health risks to researchers during while carrying out their experiments or for workers in the production process, such as toxicity, carcinogenicity and explosion. There is also the risk that consumers may be exposed to nanoparticles through the use of products (cosmetics, food) or due to their release (intended or involuntary) into the environment. They can bioaccumulate, enter the food chain of animals and human beings, accumulating in their organs, including the brain.

Several studies are being carried to quantify those risks. Until now, some experimental evidence has been obtained about harm in animals. There is controversy about the toxicity of diverse nanoparticles for humans. Specific regulations, guidelines and 'best practices' for the handling of nanoparticles in laboratory and industrial settings, usage, transport, waste disposal, etc. are being constantly demanded and will gradually be set, at least in the most obvious fields (Renn and Roco, 2006).

Animal experimentation in nanotechnology is subject to the same ethical problems that arise in any field when the 'rights' of animals to be well treated are being debated. For instance, experiments have been carried out sending nanoparticles through the internal organs of animals. Then they are dissected to check the effectiveness of the process (that is, if the nanoparticles reached the desired areas). This experimentation is a precursor to developing applications that will destroy cancer cells in human beings, thereby curing the disease.

It goes without saying that these issues become more complicated if the subjects of the experiment are humans. In theory, the same principles, cautions and recommendations that exist in the medical field apply here.

There are emerging concerns about the use of nanomaterials and nanosystems as toxic agents by terrorists or governments (in the same way as other chemical and nuclear weapons, or maybe combined with living matter to create new viruses, bacteria and other dangerous biological agents).

Various nanotechnologies are being developed to create new intelligence gathering devices, with the risk of invasion of privacy and even of the human body. The risk increases when these developments result from the combination of invisible nanodevices with powerful artificial intelligence programs. In all these cases the unethical use of materials and devices without the individual's consent constitutes a likely scenario.

In general, nanotechnologies can pose severe limits to personal choice not just in surveillance and espionage, but also if people are not informed about the composition of the products they use or are unable to choose not to use them. Although this is a common problem with modern technologies, it will probably be aggravated by the fact that nanomaterials and devices can be in some cases virtually invisible. Moreover the convergence of nanotechnologies with genetic engineering, AI and other emerging technologies will produce a cascade of intended but also unexpected side effects that will worsen the situation in this area.

In contrast to the concerns about the effects of nanotechnologies in human health and safety is the hope that the development of nanoapplications in medicine and healthcare may improve human health. In fact, a considerable part of the total public and private funding of nanotechnology is directed to research and development programs in this broad sector. Optimistic statements about improving human health and extending the life span are pervasive among promoters of nanotechnology and numerous observers. For obvious reasons public opinion mostly supports nanomedicine research in monitoring, diagnosis and treatment. 'Friendly', non-invasive technologies, like 'lab-on-a-chip' devices, help citizens accept nanoinnovations more easily.

Disability is also one of the main targets. However, some authors are warning against the role of nanotechnology in the current tendency to 'medicalize' the human body (i.e., to treat the human body as a medical issue, for example, by buying healthy food and prohibiting things that are considered harmful. This can be understood as a tyranny of medicine) and the danger that everyone unwilling to 'improve' their body and mind or who cannot afford to do so will be labelled as 'disabled', since they will be seen as inferior compared to those that 'improved' themselves (worse eyesight, less stamina, weaker memory, etc.) (Wolbring, 2005).

The prospect of humans becoming cyborgs (literally) in a not so distant future is seen ambivalently. The extreme positions here are, on the one hand, those defended by people that are convinced that the integration of non-human components in the human body is the logical path to follow; and on the other extreme, those that see this possibility as something to be avoided at all costs.

A last set of nanoapplications are related with health issues. They are designed to improve food production, storage and minimize contamination. Long lasting famine and child mortality are seen as problems that can be solved or at least alleviated by means of new nanotech systems in the agricultural sector (Kuzma and VerHage, 2006). Water purification is another field where specific applications may be of high interest, as contaminated water is among the first causes of disease in poorer countries. Specific vaccines and treatments are envisaged to combat malaria and other diseases that are widespread in those countries. Some scholars and NGOs doubt if corporations and governments of the rich countries are willing to address these tragedies, and argue that most of them are not the result of a lack of technology and resources, but of its asymmetrical distribution (ETC Group, 2005). Declarations of 'good intentions' are mostly seen as a rhetorical strategy to convince people to support nanotechnological projects, avoiding the risk of public refusal, as happened with other technologies, for example, GMOs. (These last issues connect with the question of the nanodivide, which will be discussed later.)

A general question in health, safety, security, but also in the environment and other sectors where nanotechnologies are being applied, is whether a precautionary stance should be adopted, and if so, to what extent. The precautionary principle has many different formulations, but it is basically conceived as a response to uncertainty in the face of risks to health and the environment, among others. It involves taking measures to avoid potential harm, despite lack of scientific certainty. In recent years it has been applied, not without difficulty, as a legal and political principle in many countries, particularly on the European and International level. Some NGOs have seriously considered a general moratorium on the production of nanotechnology as a result of applying the precautionary principle to nanotechnology research and development, because the risks involved have not been fully studied. However, this extreme position is neither realistic nor effective as the broad range of nanotech programs lead to very diverse problems that require case by case analyses, that is, much more specific and detailed.

Despite the controversy, the precautionary principle has become a pivotal component of a new paradigm for the creation of public policies for governing risks, including those involving technology. Therefore, since there should be concern over the diverse and unexpected effects of nanotechnological development a precautionary approach to this research and development should not be entirely discarded, but rather applied on a case by case basis.

Environment

There is a kind of 'green hype' to nanotechnology, since its advocates often present nanodevelopments as a crucial step towards the resolution of most environmental problems. Sustainability --despite all the controversies around its

meaning and the concrete ways to accomplish it-- is a challenge that cannot be postponed any longer. Is nanotech the response? The question, posed in such simplistic terms, has no serious answer. Although we all prefer simple answers to simple questions, when considering the relationship between nanotechnologies and the environment we have to think harder and devote some time to unravelling the web of points that are tangled up here.

Here we find very technical questions ranging from the risks of releasing nanoparticles in the environment (e.g. ecotoxicity) to the reduction of other contaminant by-products; from saving materials to the possibility of 'improving evolution'; from environmental problems caused by large-scale production or the difficulties of recycling nanocomposites to the blurring of the distinction between natural and artificial (the very meaning of life); from the positive impact of systems that are more energy efficient to the menace of runaway nanobots that would destroy the biosphere; from the benefits of nanotech environmental applications for poor countries to the danger that the divide between the privileged and the disadvantaged will become greater than ever.

Immense expectations are placed on the 'revolutionary' implications of nanotechnology in the field of energy. Energy storage, production and conversion would be dramatically improved by high-efficiency fuel cells, hydrogen storage systems based on carbon nanotubes and other nanomaterials, new catalysts, photovoltaic cells, light-emitting devices, improved solar cells, artificial photosynthesis systems and an entire set of technologies aimed at reducing energy consumption.

However, some specialists are not confident about nanotech leading to a noteworthy improvement of resource efficiency. Processing bulk materials down to the nanoscale might consume a great deal of energy, especially if they are employed on a massive scale. Therefore, in order to fully assess energy saving benefits, a broader perspective based on ecosystems is required, where materials, the entire life cycle of the products (including usage and disposal) and energy flows are taken into account.

Other interesting advances that can be used to confront environmental problems are being made in information and communication technology, where several nanotechnologies are being applied to design more powerful, faster and smaller computers. Who knows? Perhaps 'nano enhanced' computer power will allow scientists to obtain more accurate data on global warming and other environmental problems that help to resolve these issues.

Unfortunately, even though nanotechnology might develop many environmentally friendly instruments, thereby having a say in environmental remediation, there are other aspects to consider. The complexities of ecosystems combined with social complexities give rise to a situation where a variety of

'cascading effects' may unexpectedly alter the human and the natural environment. Because we have been endlessly 'reconstructing nature' ever since the beginning of human evolution some scholars argue that nature --at least the surface of the planet and its surroundings-- no longer exists as an independent reality. But we can expect this 'artificialization' of nature to increase exponentially in the near future because nanotechnology has the potential to dramatically escalate the speed and scale of human modification of natural environments by creating radically new kinds of materials, combining them with living beings, facilitating the creation of artificial life forms, producing systems and devices to monitor and control ecosystem dynamics, as well as 'imitating' or altering natural selection mechanisms (Preston, 2005).

Even if we assume for the sake of simplicity that we will inevitably construct a 'new nature', this still does not gives us the right to do whatever we want. We cannot, if only out of self-interest: the survival of *Homo sapiens* on earth depends on our decisions. But do we have the right to change evolutionary trends in order to 'improve evolution'? This question is related to another more general question: do we have the right to use, manipulate, modify or destroy natural beings? It greatly depends on whether those natural beings (or at least, some of them, such as big apes, trees or ecosystems) have rights and 'intrinsic value', rights and values that should not depend on our appreciation of them for practical, aesthetical or other reasons. As always, a 'yes or no' answer is not enough. An absolute prohibition of using some living beings (for example, as food) would be suicidal from an evolutionary point of view. The question about natural value and its limits has raised a long standing controversy that cannot be resolved easily. In any case, disrupting the balance of living nature is in no way an exclusive characteristic of nanotechnology. As in other cases we have already seen, what nanotech can add –solely or combined with other technologies— is a set of powerful tools to accelerate the process. No small thing!

Imagine a future where technologies are beyond any hope of control, a widespread, deep ecological crisis that jeopardizes what we call 'civilization'. Examples are pointless: we all have seen movies, read stories or played games where human achievements are just a remote memory of the past. Even so, it is probable that humankind will still survive for a considerable period of time. After all, our species is 'tough' and 'hard to kill'. That's the good news –if there is good news when speaking about global collapse. But we should ask ourselves: at what price? At the expense of what or who? In what conditions? With what loses?

The 'nanodivide'

As should be self-evident at this point, almost all the problems we are examining here cannot be neatly separated and dealt with on a one for one basis. Technical framing of problems give experts powerful means to solve them, but at the expense of losing the wider 'context' where the problem arises and has to be framed. Nanotech development and risk assessment is no exception. As modern technology is embedded in society and culture, a strictly technical approach to our concerns will always be seriously flawed. Of course we need science, we need technology, but to think that simply more science and technology will fix everything is delusory and hence dangerous. However, prominent advocates of nanotechnology insist that future nanotechnological risks will be safely counteracted by means of 'defensive' nanotechnologies (Kurzweil, 2005, p. xlvii).

Many experts believe that we have almost a moral obligation to support nanotechnology as a way to give the poorest people a chance of improving their living conditions (Mnyusiwalla et al., 2003; Salamanca-Buentello et al. 2005). Who would oppose the rights of people all over the world to have better nutrition, health care and a healthy environment? Not only for people alive right now, but also for future generations, what is called 'intergenerational solidarity' (Grunbald, 2005, 192). This is a blissful vision, in which poverty and malnutrition would be eradicated for ever, where sustainability will finally reign. Against it emerges an alternative, less optimistic version that envisions nanotechnology reinforcing global inequalities by fostering a 'nanodivide' (Mehta and Hunt, 2006, 279-280).

Nanotechnology has the potential to reduce the demand for natural resources (such as wood) and energy production, to provide potable water, combat tropical diseases, raise the living standards of people through international aid, enhance agricultural productivity and pest detection, provide valuable information about resources, weather, diseases through enhanced information technologies, and so on. But even so, the gap between the wealthy and the poorest on the planet can keep growing if the structure of global economic relations does not change (Hunt, 2006, 185). In other words, the dominant model of economic relationships among countries gives more advantages to those countries that are already in a stronger position. They can use their power to impose their interests on the market, force other nations to use economic regulations and institutions that are only beneficial to them, establish a patent system that limits or prevents the use of products in the 'developing world' and so on. While over consumption increases in rich countries (although marginalized groups in those countries cannot afford even the most basic products and services) it seems pretty cynical to ask others for restraint.

All this points to the following conclusion: the problems we are facing are not only (or even primarily) technical, but social, economic and political. Our personal lifestyles, whatever they may be, are to a large degree dictated by the current socio-economic system. Even if we are relatively autonomous, this autonomy should be balanced by others values, individual and community-based. Demands for personal autonomy (the right to decide how to live) is associated with greater responsibility, as any adult knows by experience. Justice means to give everyone equal and fair opportunities in life.

The expression 'nanodivide' describes this state of affairs, that is, the possibility of incrementing the gulf between rich and poor in terms of access to or exclusion from the new nano-innovations. This can be illustrated through the example of nano-enabled medicines. Emphasizing high-tech medicine might divert attention and resources away from non-medical aspects of community health and wellbeing that are less profitable. Basic interventions to improve sanitation and housing, clean water and access to education, among other relatively simple measures, would lead to greater improvements in human health and well-being than cutting-edge medical technologies. (ETC Group, 2006, p. 2) However, the huge investment in research makes it unlikely that nanotechnologies will address the needs of the poor, since investors expect to be compensated for their investment both financially and strategically.

Much of this can be avoided with adequate technology transfer; that is, giving countries that do not have enough money to invest in science and technology programs access to technological knowledge and resources. But scientific knowledge and technological capacity are first order strategic assets in our competitive world. No one is going to give it for free. A high-level, globally concerted political decision is needed to foster transfer processes that would benefit 'less favoured' countries and their citizens. In fact, science and technology are increasingly politicized and privatized. Producers of traditional goods in poor countries can be ruined if nanotech materials make them superfluous. If this occurs will it be fate or the logic of progress?

If only for fear of massive migration flows, it may be wiser for rich countries to invest in the economic development of the Third World.

Human nature… and more

Perhaps the greatest debate on nanotechnological development centres around the question of human nature, its modification and eventual abolishment.

So far, we have been discussing several kinds of risks associated with nanotech development because it is an understandable way of posing the question of a future shaped by nanotechnological products and systems. At least apparently.

Earlier we warned against hoping that by treating problems as 'risks' makes it easier to resolve them.

To the dismay of nanoenthusiasts, risk experts and decision-makers, uncertainty and especially ambiguity are not so easily left behind. Admittedly, risk analysis enables us to deal with some problems in a technically manageable way: it makes it possible to detect, quantify, prevent or at least alleviate future harms for us or the environment. We thus feel confident, in control. But sometimes, and above all where big problems are concerned, this technical approach only hides another danger, even worse that the neat list of risks we have so carefully described. Perhaps we should restate big problems in terms of moral dilemmas, that is, conflicting values on what is good or evil, beneficial or detrimental (McKibben, 2003, 191). Take the case of a nano 'improvement' that may cure an individual's disease, but at the same time have negative effects on the community. This could happen in different ways. For example, the difference between cure and improvement is anything but well defined. Both critics of human enhancement and the so-called 'transhumanists' and other true believers in a posthuman future agree on this point. Once we get into the business of human manipulation it will be almost inevitably replace myopia with night-vision; cure a predisposition to suffer anaemia with a blood stream awash with oxygen transporting nanobots; transform short people into basketball players; trade mediocre children for 'brainiacs'. Those are not really risks, insofar as we all agree that are valuable things to pursue. But what if not all agree with these modifications? Many people –not only religious people—are deeply disturbed by the prospect of a future where it is not longer clear what is to be human. Cyborgs are fine for movies, they argue, but we should respect human nature as it has always been.

In a passionate and brilliantly argued book the well-known environmentalist Bill McKibben calls for a stop to some crucial developments in genetic engineering, robotics and nanotechnology because they call into question what constitutes a human being. He urges us to say 'enough'. We have problems, no doubt about it, but we, at least in Western countries, live reasonably well. To have more does not mean more happiness. In their more advanced forms, those emerging technologies will "destroy the meaning of our lives" (McKibben, 2003, 95). This has to do with future, but also with present. As McKibben points out, we need a new way of looking at the present (McKibben, 2003, 112). We will 'design' the future according to how we feel about the current situation (individual, collective), whether we believe is acceptable or untenable. We act when we feel confident about the means to improve the present state of things in those aspects that are worth alleviating, even those that are in need of an urgent change. The future is created from the dreams of today. Before something comes true, before people take the necessary steps to make something real, there has to be a blueprint, an inspiration to guide our steps. Some people who are sceptical of technology spurn plans for human enhancement as the deliria of too

imaginative minds, as ridiculous science fiction. In many cases it could be. But even so, we should keep in mind that popular literature and sci-fi movies have shaped the minds of many of the experts that are currently developing the new technologies, as well as the minds of even more people that are willing to support that kind of research, press their governments to give financial support and buy the products when released to the market. Dreams become 'dreams of reason', visions that shape scientific imagination (Dupuy, 2005). Somebody dreamed about robots before robots began to be manufactured.

In a popular series of stories, the scientist and science fiction writer Isaac Asimov imagined the evolution of robots and their eventual triumph over humans. Their victory was not the result of a deadly fight for survival, but rather of the robots slowly exerting a benign control over humans, until the robots become so 'human' that they cannot be told apart from original human beings … except for the fact that they are 'super-human'. As humans – 'enhanced' humans, so to speak—robots no longer have to obey people, but at the same time they are expected not to harm or exterminate human predecessors because a real human being (as the robots would be) must be compassionate rather than aggressive with their own species, something that is not at all clear.

If Artificial Intelligence, genetic engineering and nanotechnology eventually reach the point of making super-computers, dramatically changing human genetics or making a 'mix' of both possibilities (cyborgs, human minds 'uploaded' to computers) then the traditional meaning of humankind will be profoundly altered –if indeed a remnant of that meaning survives. So the million-dollar question is: what does it mean to be human? This is the question that the most advanced Asimov's robot poses to itself[4]. The answer is not the physical configuration (to possess a human body) but rather rationality. Since the enhanced robots are rational beings, they are entitled to be called humans.

What does it mean to be human? Is it to have an immortal soul? Is it to be the product of some specific biological evolution trend? To know the difference between good and evil? To have reason? Throughout history different answers to this question have been put forth. Maybe Asimov's robots are mistaken, and rationality is just a characteristic that different beings can share, without defining humanity. Maybe there is something wrong in all the attempts at discover the 'essence' of humanity. Because humans are adaptable our experiences, perceptions and values have constantly changed since the dawn of humanity. The human condition entails the ability to construct our own world and as a consequence we can be creative with ourselves. If we change the perspective, if we speak of the 'human condition' instead of 'human nature', a different landscape opens to us (Dupuy, 2005). There will be no reason to stop

[4] In a story called "That Thou art Mindful of Him". In The Complete Robot. New York: HarperCollins, 1983.

technological developments that could significantly alter our current way of life, our current way of existing and experiencing the world.

But we better be careful. Since most of these modifications would be irreversible and affect future generations that have no voice in this debate; the point is how we are going to have criteria enough to decide whether the changes are worth pursuing or not. After all, what exactly does this "we" that we are so cheerfully using refer to when vital choices are made? 'We will design the future', alright, but who is 'we'? We all have an incomplete, far from perfect control on our individual lives, not to mention the possibility of making significant changes in our social environment. In our globalized world, the power to make big decisions that affect all of us and the whole planet is concentrating more and more in the hands of a few governments, corporations and individuals. It is said that one person's sweet dreams are another person's nightmares (utopia and dystopia are inextricably connected to modern technology). Every measure should be taken in order to avoid a world not desired by a marginalized majority; or a world were individuals are not even capable of taking crucial decisions about their body, mind and about how to live their lives. In the end, everything converges into a single question: how can we reach appropriate agreements for sharing a common world?

Conclusion

While the planet is heading for disaster –and we humans with it— many proponents of nanotechnology imagine hundred of banal, trivial, childish, crazy or even plainly silly applications, like using nanobots to clean the TV screen. They are like children looking for the next toy to play with… and quickly throwing it aside to get another one. In some respects, they are like little boys that were so affected by a story that they cannot sleep thinking that someday they will be the hero of the story. That's usually a good thing… for kids. Alright, we've all been impressed by spectacular sci-fi films, electronic games and stories. But it is one thing to day dream about boarding the last spaceship to the stars and another thing to become so obsessed with this plan that one loses sight of other important aspects in our life. What is worse: to get obsessed to the point of trying to force all of humanity to join the crew to go where nobody knows.

But technology is not merely a toy, something to play with. In reality, technology goes far beyond a simple tool that can be used for good or evil. Admittedly, someone can use an axe to break down a door and in so doing save a person from a burning house, or to split a head in two just for fun. We understand that the glory or blame must be given to the person that uses the axe, not to the axe itself. With technology is not that easy. Many technologies are so versatile, flexible and 'enabling' that they contain the potential for a myriad of different applications and products, some considered socially beneficial and

others detrimental. Still, this is only half the story. In order to really put those products in the marketplace specific research programs and projects are required, together with other pivotal conditions like 'action plans', permissive laws and regulations and a great deal of financial support (Commission of the European Communities, 2005). So it is not just the technology, nor just the person that uses it. Rather than thinking about 'nanotechnology' we should think about nanotechnological networks, each of them composed by different elements, human or non human, each of them with their own dynamics and momentum (de Cózar-Escalante, 2006).

Strictly speaking there is no such thing as 'nanotechnology', but rather an endless number of possible nanotechnologies. As we have seen in the examples presented in this paper, a number of nanotechnological projects will be feasible because of the values that support them. In turn, those projects will foster other values that support them, values that will sometimes be imposed at the expense of others: endless change or self-restraint, individual gain or collective benefit, the search for immortality or acceptance of death, domination of nature or conviviality with her, recognition of other's specificities or intolerance.

Each choice about what nanotechnological path to follow can mean a step towards the resolution of the forthcoming global crisis or, inversely, its deepening. Each decision about priorities brings about a (partly) different future. This entails dream and vision –passionate, of course, but also wise and judicious. Sound boring? If you think about it perhaps you'll see is a challenge you cannot ignore.

In any case, as the old REM song goes, one thing is certain: 'it's the end of the world as we know it'. They added 'and I feel fine'. How about you? Do you feel fine? Will we all be fine?

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Some websites of agencies, groups and non-governmental organisations (NGOs) containing interesting documents on nanotechnology

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- Demos, www.demos.co.uk/
- Environmental Defense, www.environmentaldefense.org/home.cfm
- ETC Group, www.etcgroup.org/
- Foresight Nanotech Institute, www.foresight.org/
- Greenpeace, www.greenpeace.org.uk/
- International Council on Nanotechnology (ICON), http://icon.rice.edu/
- International Nanotechnology and Society Network, www.nanoandsociety.com
- International Risk Governance Council, www.irgc.org
- Meridian Institute, http://www.nanoandthepoor.org and www.merid.org
- NanoEthics Group, www.nanoethics.org
- Nano Ethics Network,http://www.teo.au.dk/cfb/forskning/omraader/nanoethics
- NanoJury , www.nanojury.org/
- Nanologue (EU sponsored project), www.nanologue.net/
- Nanosafe (EU funded project on the safe production and use of nanomaterials), www.nanosafe.org/
- Woodrow Wilson Center, Project on Emerging Nanotechnologies, www.wilsoncenter.org/nano

Culture, Nature, and Global Environmental Concern

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Abstract

The natural environment is perceived in distinctive ways in diverse cultures. As the integrity of the natural environment becomes recognised as a global concern, we need to ask how culture and nature are, and can be, related. In many societies nature and culture are *not* considered as opposites, a fact which has been acknowledged in the adoption of "cultural landscapes" as a category for protection in the World Heritage Convention. This paper addresses the issue of globalization and the environment by introducing a re-evaluation of the distinction between natural and cultural heritage, and, in this context, of the relation between nature and culture. In this paper I propose that nature can be understood as an important, distinctive category, even while granting the constitutive role of the culturally structured gaze.

Keywords: *culture of nature, natural heritage, conservation*

1. Introduction

It has become commonplace to suppose that there are no more truly natural places left in the world because of the human-caused changes in the natural environment that span the Globe. Urbanisation, agriculture, mining, fishing and tourism are having an ever greater impact on the natural world. Often these kinds of transformations are attributed to 'culture,' with the consequence that it may be supposed that the human and the non-human are necessarily at odds with each other. When this conclusion is drawn an opposite reaction may set in, on the basis that human beings really are only one other species among many on this planet. The effect of this counter movement is that an attempt is made to find a conceptual scheme by which the differences between the human and the non-human are minimised in some way.

Usually the result of the denial of the distinction between the human and the natural is that we are left with the paradoxical consequence that it is supposed that human beings belong to nature but, somehow, engage in activities that do not quite fit into nature. (And we might say, rightly so, since some of the activities human beings are engaged in are highly destructive of life and sustenance.) The question we might pose ourselves then is how we may avoid the paradoxical conclusion that humans, arguably being as natural as any other species, seem to be bringing about results that we intuitively feel are out of place in nature – when they act 'naturally.'

My starting point to address this issue is by taking note of the inclusion of "cultural landscapes" as a category for protection in the World Heritage Convention in the 1990s. I propose that this event calls for a re-evaluation of the distinction between natural and cultural heritage, and, in this context, of the relation between nature and culture. I begin, therefore, by considering the notion of natural heritage, as developed in relation to the World Heritage Convention, the questions that have been raised regarding the idea of nature, and the supposed contrast between nature and culture. I continue by taking note of the manner in which the idea of culture functions, how nature and artifice relate to culture, and show what it means to speak of a culture of nature. After this I offer a sketch of the consequences that these considerations have for natural heritage conservation,[1] and for our understanding of the relation between natural and cultural heritage. The conclusion at which my paper drives is that nature can be understood as an important, distinctive category after all, despite the

[1] In this paper I do not specifically distinguish between conservation and preservation (and, so, use them interchangeably) mostly because the discourse regarding the protection of natural heritage is generally carried out in terms of 'conservation.' The interchangeable use of these terms in this context is harmless, moreover, since here I am *not* concerned with the *motivations* for interacting with nature in a certain way (for our vs. for its own sake) but with the kind of cultural fabric that will bring about, or maintain a certain state.

interpenetration of the natural and the human-made. I argue, moreover, that it makes sense to speak of – and to pursue – what we might call a *culture of nature*.

2. Nature and Culture: Reconceiving Natural and Cultural Heritage

The idea of *heritage*, like the idea of *inheritance*, involves reference to something that comes from the past and is legitimately enjoyed by some person or persons in the present.[2] Heritage, however, involves further reference to something fundamentally shared in common, perhaps by all those who belong to a nation, ideological affiliation, or other affinity group. Hence, one speaks of national heritage, the heritage of the abolitionists, or the heritage represented by Moorish architecture. As such, heritage belongs to some group in a trans-temporal manner: it is something to be enjoyed not only by certain people in this generation, but also by the relevant set of people across time, possibly for indefinitely long future periods. Consequently heritage, in contrast to inheritance, may be defined as *the stock of valued goods passed on from the past to the present; the integrity of which is to be protected, possibly to be enjoyed and to be augmented, but not to be used up, before being passed on to the future*.

The distinction between natural heritage and cultural heritage is conceived in terms of their respective provenances, natural and human, respectively, which imply distinctive values. The terms "natural heritage" and "cultural heritage" have received increasing recognition ever since the signing of the Convention Concerning the Protection of World Cultural and Natural Heritage (World Heritage Convention, in short), originally adopted by the General Conference of UNESCO on 16 November 1972. In the Convention's "Mission Statement" the two sorts of heritage are described thus:

Cultural heritage refers to monuments, groups of buildings and sites with historical, aesthetic, archaeological, scientific, ethnological or anthropological value. Natural heritage refers to outstanding physical, biological, and geological

[2] Certain kinds of inheritance, as well as certain kinds of heritage, however, seem rather to be borne than enjoyed, if they involve a disagreeable condition. This may be for a variety of reasons. We speak of the weight of history as a kind of 'heritage' which brings on physical as well as psychological burdens, which later generations have to bear, as, for example, after a war or after a disaster of some sort. But even ostensibly positive things can be hard to bear if the obligations that they bring along issue in hardships for those involved, as, for example, when the artistic or natural goods passed on are expensive to maintain or to protect. Here I will not address this issue further, primarily focussing on the idea that both heritage and inheritance concern some thing or things that are identified as *valuable* by some person or group of persons at some point in time.

formations, habitats of threatened species of animals and plants and areas with scientific, conservation or aesthetic value.[3]

The World Heritage Convention does acknowledge that there are some sites best described as having *mixed* value, insofar as they combine features valuable from both the natural and the cultural points of view:

Works of man or *the combined works of nature and man*, and areas including archaeological sites which are of outstanding universal value from the historical, aesthetic, ethnological or anthropological point of view.[4]

The World Heritage site of Thingvellir is an example of a mixed site, since for Icelanders it boasts both cultural and natural values in a manner similar to, for example, Kakadu in Australia.[5]

The *prima facie* distinction between natural and cultural heritage was questioned in a fundamental way in the 1990s, leading to the adoption of the notion of "cultural landscapes" as a category for protection by the World Heritage Convention.[6] Mechthild Rössler points out that cultural landscapes … illustrate the evolution of societies and human establishments throughout the ages, *as influenced by the advantages or the constraints of their natural* and *social environment*. They are therefore an addition to, rather than a replacement of, mixed properties (i.e. those that match up to both natural and cultural criteria).[7]

Cultural landscapes directly acknowledge the joint action of human and natural forces in the generation of certain heritage sites, but this new category also raises questions regarding the source of the value of other sites. It can be argued that cultural heritage sites, such as Angkor (Cambodia), at least partially acquire their worth through being situated in a certain natural environment (a tropical rainforest), while the value of natural heritages sites, such as Yellowstone National Park, depends at least in part on their contrast to humanly transformed environments (roaded, urbanized U.S.A.). These circumstances make opportune

[3] UNESCO (2000).

[4] UNESCO (2000).

[5] Sometimes there may be an interesting interaction of the distinct cultural and natural values attributed to a site. For example, according to Ólafur Páll Jónsson (Letter to Thomas Heyd 12 December 2005) "the fact that Thingvellir is culturally very important has played a substantial role in the protection of nature there."

[6] The present criteria concerning cultural landscapes are to be found at http://whc.unesco.org under "Operational Guidelines", Ch. 1, Part C., Criteria for the inclusion of cultural properties in the World Heritage List, sections 35–42. For discussion, see Mechthild Rössler (1993a, 1993b and 1993c), also found at http://www.unesco.org/whc/news/index-en.htm. Also see von Droste *et al*. (1995).

[7] Rössler (1993a)

a re-assessment of the relation between nature and culture as they come to bear on the notion of natural heritage.

Questioning Nature

To date, much of the motivation for setting up nature reserves and national parks, and for designating some of those areas as World Heritage sites, has arisen from the conviction that the few remaining portions of 'pure,' untouched nature should be preserved in their original state. As a result, resident human populations typically have been relocated outside such protected areas (while management teams, along with guards and scientific researchers, are allowed in). As of late, this neat picture has begun to fall apart for a diversity of reasons.

On the one hand, there are those who proclaim that we are at "the end of nature" since, through active colonization and, in any case, through aerial transport, all parts of the Earth's surface and atmosphere, as well as generous portions of its subterranean and submarine areas (and even some parts of extra-terrestrial space), have been affected by human activity.[8] Moreover, the global climate change induced through the large-scale burning of fossil fuels over the last sixty years will affect basic conditions for most, if not all, of the planet's living things. So, is there any 'real,' not anthropogenically altered, nature to be protected?

On the other hand, the study of cultural landscapes has led to the question whether 'pure' nature areas are really desirable since, at least under certain conditions, higher biological diversity may be found in areas actively modified by human beings than in areas without human presence. In a classical study, Gary P. Nabhan *et al*., for example, determined that, with respect to two oases on either side of the U.S.-Mexican border, the one on the Mexican side, still used for agriculture, had greater biodiversity than the one on the U.S. side, managed as a people-excluding nature reserve.[9] Since the 1992 Rio World Summit, biodiversity has been recognized as one of the most important indices of natural areas. So, why seek out and protect purportedly virgin nature if humanly modified areas may have *greater* biodiversity?

Furthermore, some claim that nature is an arbitrary, cultural construct. *First*, from a semiotic perspective, all classificatory categories are a function of the differences inherent in a system of signs. Hence, the category "nature" is said to be a function of the historically contingent existence of a certain system of signifiers (in European languages), which makes the distinction natural vs. non-natural the result of arbitrary (conventional) linguistic facts. In this context it is,

[8] See, e.g., Bill McKibben (1989).

[9] Nabhan *et al*. (1982), pp. 124–143. Also see Tim Peschel (2000), who reports on hundreds of species found within the parks in the Potsdam area but not generally outside those managed spaces. But see Holmes Rolston (1991), 370–377, in critique of Nabhan et al.

moreover, relevant that, at least in European belief systems, nature historically was seen as dangerous, exploitable, and intrinsically inferior to human beings. Since nature was associated with women and non-European, indigenous peoples, and these categories have been associated with inferior status, some have suggested that distinctions between the natural and the non-natural play into a noxious kind of duality, implicated in oppressive, patriarchal and colonial power relations.[10]

Second, it is also argued that empirical investigation shows that the conceptual contrast which leads us to distinguish between the natural and the humanly influenced part of the world is not universal but, rather, idiosyncratic to certain peoples, such as those of European culture.[11] The conclusion, once again, is that, to distinguish some parts of the world as natural in contrast to others is parochial and arbitrary.

Finally, some propose that, by separating out certain areas as national parks or nature reserves, the essence of nature, wildness, precisely is extirpated from those areas. The argument is that true (wild) nature must be 'free,' but, once an area is designated as a park or reserve, it is fenced in, large animals living in it often are radio-collared and regularly culled, fires are suppressed, and the whole area generally tends to come under intense observation and management. Arguably, these measures are taken to protect such areas from external incursions and to maintain the ecological 'balance' of the ecosystem, but, in the process, such areas lose some of the original, wild qualities for which they were conserved.[12]

In light of these various considerations it may seem inadvisable to insist on the conservation of areas for their 'natural' heritage value as opposed to their value as a 'cultural' heritage. I argue that the considerations adduced should, rather, lead us to re-examine the relation between the humanly made and nature.

Are Nature and Culture Opposites?

Many authors directly treat nature and culture as opposites, culture being equated with the human-made, while nature is considered the realm untouched by culture.[13] Although this contrast reflects a certain common usage, there is

[10] For discussion see Plumwood in Heyd (ed., 2005).

[11] See, e.g., T. Ingold (1992).

[12] For discussion of the role of parks, see, e.g., Thomas H. Birch (1980). Regarding the relation of wildness and certain human activities, see Woods in Heyd (ed., 2005).

[13] But see, e.g., Bruno Latour (1993) who argues that "*the very notion of culture is an artifact created by bracketing Nature off*. Cultures—different or universal—do not exist, any more than Nature does. There are only natures-cultures…" (p. 104), Also see Yrjö Haila (2000), pp. 155–75.

reason to reassess its utility. Beginning with the notion of nature, it is notable that some of the things which human beings make and do, intuitively speaking, rather seem to fit in the "nature" category: human beings gather food, seek safety and make shelters; they reproduce through sexual intercourse, gestation, and by giving birth to children; they breathe, they digest, etc. Such "natural" activities always are overlain with a particular culture's impress, but, *as such*, they are of the same kind as those of relevantly similar non-human animals.

"Culture," moreover, is a term with a complex set of referents.[14] One can stipulate that it stand for whatever is made by human beings, but, taking into account the rather "natural" human behaviours noted above, we may recall that we have more precise terms for the human-made, namely "artefact" and "artificial." From a pragmatic point of view, the category "natural" simply marks off the non-artificial from the artificial. Conceiving of the human-made as artefacts and the artificial has the advantage, moreover, that artificiality can easily be seen as graduated according to the degree of human intervention.[15] For instance, if I pick an orange, squeeze it, and immediately drink the juice out of a glass, this juice is more natural and less artificial than the 'orange drink' which I might synthesize from orange-similar flavours and vitamin C, adding water and orange colouring to this, storing this brew in a plastic bottle, and eventually serving it in a polyurethane cup.

One may wonder, though, what exactly makes something artificial if the ultimate 'raw material' for human activity originally always is something natural. It may at first seem that the degree of artificiality of some thing simply depends on the amount of *arte*, technique or technological intervention applied to the pre-existing natural material. This turns out to lead to intuitively paradoxical consequences, however, since often the technologically more sophisticated interventions are the ones that cause less disturbance in nature.[16] It is clear, in any case, that human activity, technically mediated in some fashion or other, can interfere more or less with the course that things would take in the absence of humanity. So, even if all of the Earth's surface and atmosphere has by now been affected by anthropogenic phenomena, such as air pollution or global warming, we can still speak of many areas of the globe as being highly natural and only negligibly artificial.

[14] See Tim Ingold (1994), pp. 327–349.

[15] As noted, this way of characterizing the natural is a matter of convenience or pragmatism. John Passmore makes a similar proposal in *Man's Responsibility for Nature*, (fn. p. 5). Though we cannot broach the topic here, the distinction becomes more problematic once we incorporate the notion that, in some fundamental way, human beings are also natural. One may, however, perhaps speak of the contrast between *human* artefacts and artefacts made by *other* beings since ethologists tell us that a number of other animal species make simple tools, shelter, etc.

[16] I am thankful to several colleagues, especially to Bob Bright, who helped me come clear on this point.

In short, my analysis leaves an important role to the term 'nature,' since it designates those portions of the world of *another form of spontaneity than the human*.[17] Importantly, hence, the distinction between what is called 'nature' and what is not is *not* eliminable on the basis of the supposed arbitrariness of such designations. At least among the cultures with roots in Europe (i.e., those of "the West") the terms "nature" and "natural" have rather deep significance, insofar as they designate fundamental ontological categories.

The identification of nature with dangerous forces needs to be thought through carefully since, even when 'natural disasters,' such as fires, floods or earthquakes hit human communities, human lives and goods typically are at risk because of decisions to locate in risky areas (such as near forests, on floodplains, or on fault lines). Nature's imperviousness to domination, be it in resistance to biocides or to disaster-preventive measures, indicates, furthermore, that nature cannot properly be associated with the inferior and manipulable. In other words, nature is not a model of the subservient. Hence, associating women and indigenous people to nature should not lead to a reinforcement of oppressive, patriarchal, and colonial power relations. To say that such nefarious power relations are justified because they are "natural" is simply a poor attempt to justify attitudes based on ignorance of the complexity of the natural world. Human dependence on nature's autonomous functioning, and nature's continued supply of essentially free, highly valued goods to humanity (as a sink for human waste products, and as a source of basic biological resources) rather highlights nature's beneficent role.

Moreover, even if other peoples divide up the world by different ontological categories than we do, this is a moot point. Every society makes distinctions in the perceived world that it interacts with. Even if other people have not seen the need to distinguish between the human-made and the non-human-made in the manner that people of European cultural origins do, this is no reason to suppose that the distinction is useless to us or without foundation.

This leaves us to consider the question whether it makes sense to preserve certain areas as examples of 'pure' nature, given that, at least in some cases, certain indices of naturalness, such as biodiversity, at times seem to argue *for* human intervention. Before addressing this question, I consider in more detail the relation of nature (and its opposite, artefactuality), on the one hand, to culture, on the other, by taking into account some of the discussions on the definition of the term "culture" in anthropology.

[17] By the term 'spontaneous' I mean the expression of a being's own way, i.e., the expression of its specific qualities. Also see Aristotle's account of nature in *Physics*, book II, Ch. 1. He proposes that "*All the things mentioned present a feature in which they differ from things which are not constituted by nature. Each of them has within itself a principle of motion and of stationariness … .*" (*Physics*, II.1, 192b, 12–15) In this way each natural thing has its own "autonomy" or spontaneity. (I am indebted to Taneli Kukkonen for clarifying this point).

3. The Culture of Nature: Understanding Culture

E.B. Tylor defined "culture" as that "complex whole which includes knowledge, belief, art, morals, custom and any other capabilities and habits acquired by an individual as a member of society."[18] As Lee Cronk reports, since the time that Tylor offered his definition there has been a tendency to narrow the concept to the cognitive components of his notion.[19] J.H. Barkow considers culture to be "a system of socially transmitted information."[20] Others emphasize the fact that culture is not something private, but, rather, something in which more than one individual participates. For example, J. Tooby and L. Cosmides define culture as "any mental, behavioral, or material commonalities shared across individuals."[21] These considerations, therefore, speak against equating the human-made with culture *tout court*, since what some particular individual does or makes need not be representative of any one group's commonalities.

The etymological root of the word "culture" is found in the Latin term *colere*, which refers to the activity of working the land and creating places for living there. This root meaning of "culture" is preserved in terms such as to "cultivate" and "agriculture". At this point the inherent normativity of the term "culture" comes to the foreground as exhibited in value-laden expressions such as "*un*cultivated" and "*un*cultured." The positive value intended to be conveyed by the term "culture" and its derivatives is clearly detectable, for example, in John Locke's (ethnocentric) declaration that the lands of the Americas are not worth much until *cultivated* by the (European) colonists. The normative aspect of the term is also evident in the meaning of the German word "Kultur," which stands for the value-laden terms "civilization" and "high culture" in English. Culture in these senses is taken to express what makes human beings truly human, life really worth living, and the "barbarous" supposedly so deserving rejection. This is a use of the term that has given expression to ethnocentric and anthropocentric sentiments, but need not. I use here a concept of "culture" that takes into account its characteristic aspects, including its normativity, albeit without opening up the term to discriminatory discourse.

The points noted above, including the positive normative load contained in the ideas of "cultivation" and of becoming "cultured," suggest that the core meaning of the term has to do with the actualization of valuable qualities[22] that are potentially present in certain things. The term "culture" is applied in this sense

[18] E.B. Tylor (1871), cited in Lee Cronk (1995), p. 182.

[19] Cronk (1995), p. 182.

[20] Barkow (1898), cited in Cronk (1995), p. 182.

[21] Tooby and Cosmides (1991), 19–136, cited in Cronk (1995), p. 182.

[22] This explains why we may feel that to speak of culture as the culprit of depravity, war, or environmental devastation contains a contradiction.

when we speak of the shaping of food-productive land (agriculture),[23] but also of the 'shaping' of certain intentional soundscapes (the creation and appreciation of music), of our imagination (the creation and reception of literature), or of society (the development and application of political theory and of diplomacy). In each case "culture" makes reference to the eliciting, or to the enabling of the reception, of certain potentially present qualities of things (land, aural space, the imagination, human society) valued by us.

To summarize, my proposal is that we take *culture* to be constituted by *ways of acting and perceiving, based on particular skills, beliefs, types of knowledge, and habits, that are more or less disseminated across individuals, that are not inborn but rather invented, modified and passed on, and that are valued because they may bring forth certain inherent qualities of some thing, capacity or process*. Using this understanding of culture we may ask how nature and culture are related to each other.

3.1. Relating Nature and Culture

As of late, biologists and anthropologists also credit about a dozen species of non-human animals with culture.[24] The classic case of culture in non-human animals is constituted by the macaques in Japan who followed the example of a particular individual, Imo, who had begun washing her dirt-covered sweet potatoes before eating them (thereby facilitating the appreciation of the specific, valued qualities of the tubers, formerly masked by dirt). Another striking example is furnished by tits (a certain species of bird) that had learned to perforate the lids of milk bottles in a particular area in Britain, whereupon the skill slowly spread to other tits. Some apes trained in human sign language, furthermore, have taught others, which is a clear case of culture transmission; in this instance the chain begins with human beings and then continues among our primate cousins. Chimpanzees in the wild, as well as orang-utans and whales have also been credited with culture.[25]

These observations speak against identifying culture merely with the human realm.[26] Furthermore, since culture has the connotation of eliciting specific, valuable qualities from things, I posit that, in analogy to the culture of vinous beverages (viti- and vini-culture), the culture of sound harmonies (music), and

[23] In a related vein, Jules Pretty (2003) reminds us that originally "agriculture was interpreted as two connected things, *agri* and *cultura*" (p. xii).

[24] This heavily debated topic is often studied under the rubric "social learning"; see, for example Heyes and Galef (1996). But see David Premack and Ann James Premack (1994).

[25] See Whiten *et. al*. (1999), van Schaik *et. al*. (2003) and Whitehead (1988).

[26] But see Ferry (1992), who maintains that culture is an exclusive feature of humans, which distinguishes us from nature, in particular animals: "… man is the antinatural being par excellence" (p. xxviii).

the culture of dexterous movement (sport), there is or can be *a culture of nature*.[27] Such a culture of nature consists in the shareable ways of acting and perceiving that reveal the specific, valuable qualities of *nature*.[28]

3.2. Practicing the Culture of Nature

It may seem that, if a culture of nature implies that one should *act on nature*, one will through this action *ipso facto* turn nature into an *arte*-fact. In reply, I propose that culture, properly understood, implies the development, and not the suppression, of some thing's spontaneity. How else could one expect creativity to emerge in any of the arts, for example? I suggest that we may act on nature without necessarily increasing its artificiality. Protecting an area that we designate as a nature reserve or national park, for example, is a way of acting on nature that (notwithstanding the management to which such areas are subjected) may allow for *freer* development of the spontaneity of nature within those boundaries than would otherwise take place.

A culture of nature is concerned with preserving natural things from becoming artificial things, such as an industrial forest or cropland managed by agribusiness; such as a roadway or a mining area; or such as a genetically modified organism or a radioactive environment. A culture of nature calls for interventions that protect natural sites and processes from further incursions in order to facilitate their own kind of spontaneity. This equally applies to (apparently) pristine areas as to areas where there already is cohabitation between human and non-human nature.

In places which already have been culturally modified, a culture of nature may help bring about, and help us perceive, natural qualities that might not flourish,

[27] The term "culture of nature" has been used by others in a variety of senses, which only partially overlap with the meaning I give the term here. Alexander Wilson titles his book, for example, *The Culture of Nature*. His title is to highlight that nature is not separate from humanity. He intends to show that "nature is part of culture" insofar as "humans and nature construct each other." (pp. 12–13) I tend to agree but think that the term 'culture of nature' should be reserved for the more specific notion that I propose here. Light in Heyd (ed., 2005) also uses the term "culture of nature" but to refer to the relationship of humanity with nature in general.

[28] Also see Passmore, especially Ch. 2, where he discusses a tradition in European thought that posits the possibility of human "cooperation with nature" pursued for the joint good of human beings and non-human nature. He points out that "to 'develop' land, on this way of looking at man's relationship to nature, is to actualise its potentialities, to bring to light what it has in itself to become, and by this means to perfect it." (p. 32) Passmore (Ch. 2), moreover, gives an historical account of the idea of cooperation with nature, pointing to its mostly Pelagian origins, and refers to further development of it in modern times by J.G. Fichte, P. Teilhard de Chardin and Herbert Marcuse.

or be evident, otherwise.[29] As noted above, at some places and in some times, traditional forms of agriculture and certain forms of landscaping have brought about cultural landscapes with a complexity of ecological niches that favour a greater biological diversity than would be found in such environments, either if worked with industrial agricultural techniques or if not worked at all. It is not clear to me that such cultural landscapes are worth creating merely for the sake of such increases in biodiversity, but, where there are other legitimate reasons for transforming the land (such as for food production to satisfy genuine need), these approaches can at least claim to have elicited the flourishing, and not the suppression, of certain natural qualities, thereby balancing out, up to a point, the artificiality generated.

4. Consequences for Natural Heritage Conservation

The idea that certain types of human activity have a legitimate place in nature is not new, of course. A number of poets, natural scientists and philosophers, such as Goethe, Alexander von Humboldt and Charles Darwin, assumed this view, which has a diversity of intellectual ancestors in Spinoza and certain ancient schools of philosophy (such as Epicureanism). The crucial question, however, is what responsibility human beings have toward their natural environment. Notably, given the analysis of the idea of heritage sketched above, the idea of *natural* heritage implies the assumption of responsibility for the conservation of at least some portions of *nature*.[30]

I propose that natural heritage conservation may be one way of engaging in a culture of nature. This, though, is to acknowledge that designating a portion of nature as heritage implies an *active*, concerted kind of engagement with natural spaces and processes—even if only to keep further human intervention at bay. From this perspective the question is how human beings may relate to non-human nature so as to respect its spontaneity, that is, the expression of its specific qualities. Hence, insofar as what we might call 'culturing' consists in preserving and eliciting certain inherent qualities of things or processes, the

[29] Various authors have taken this viewpoint, for example, Beat and Beatrix Sitter-Liver, "Preface" (1995), who speak of the necessity of "an understanding of culture *within* nature" (their emphasis) leading to "practical ways which may lead to a sustainable dwelling of human beings, [and] of all living beings, within the realm that nature offers." (p. 13) The idea of working with and within nature has a long ancestry in some cultures and subcultures. Passmore argues that the culture of cooperation with nature exists in European cultures at least since the time of the Stoic Posidonius (p. 33). He, like others, also points out that "the ideal of 'conforming to nature', of working with, rather than against, its grain, has been tremendously powerful in Chinese thought…." (p. 26)

[30] Also see Hammond (1985).

application of this notion to natural heritage sites has important consequences for the practice of conservation.

First, given that at this point in the history of our planet human interaction with nature, at many levels and in various ways, is inevitable, we need to think through how best to proceed.[31] Rather than advocate a policy of *apartheid* between human beings and non-human nature for some few areas, leaving the rest open to rapacious, corporate profit-maximisers, the perspective opened up by the idea of a *culture of nature* is of a more inclusive reflection on our impact on the non-human parts of nature.[32] On this view, human presence may be quite acceptable, even in certain parks and nature reserves, depending on the *type* of engagement.

For instance, in many parts of Amazonia native people and extractivists practice a sustainable kind of use of rivers and forests which respects the spontaneity of natural things (their manner of use of the environment allows those natural things to express their specific qualities). Both the source of their livelihood and the integrity of their environment are threatened, however, by expansionist cattle rangers and mining interests. As the world has recently found out, on the occasion of the brutal murder of Sister Stang (a case similar to the assassination by ranchers of Chico Mendes in the 1980s), the latter will not stop at anything to satisfy their short-sighted greed.

Unfortunately, the creation of parks and nature reserves in such areas can *also* threaten the livelihood of local people, while, paradoxically, being *counter* productive from the point of view of nature conservation, since the people, who would have been watching that fragile ecosystems remain in functioning order, generally are henceforth excluded from those areas. In the Amazonian region rubber-tappers, artesanal fishers, and indigenous people have joined together in organizations which demand that they be permitted continued access to their traditional territories. In some places they have gone as far as to establish their own 'zoning' practices, requiring differential use of the lakes in their region.[33] Their aim is to protect their communities, which they perceive as intertwined with their natural environments, so as to retain their physical self-sufficiency and cultural autonomy.[34]

[31] We are involved. To deny this would be a form of bad faith (in Jean-Paul Sartre's existentialist sense).

[32] This is not to say that advocates of parks and reserves are not aware of the need for a wide-ranging, nature-respectful approach to all of human interactions with nature, of course. (I thank Philip Cafaro for reminding me of this.)

[33] See Diegues (2001), p. 165.

[34] For further information on the possibilities of protecting human communities *together with* natural environments, as made evident in Latin America, see Heyd (2004).

The idea that we may engage in a culture of nature means, among other things, that nature conservation and preservation in natural heritage sites (and elsewhere), intended to maintain the flourishing of nature's spontaneity, in many cases need not exclude human beings. As such this perspective gives support to the efforts of local people to protect their traditional, sustainable use and tenure on the land, and underwrites recent, new initiatives that favour the inclusion of traditional, resident populations in national parks and biosphere reserves if their activities do not suppress the expression of nature.[35]

Second, because this perspective openly acknowledges that designating certain areas as parks or nature reserves is dependent on particular *cultural* perspectives, it facilitates reflection about the *arbitrariness* of the particular boundaries established by such designations. That is, this perspective considers the creation of parks and natural reserves as a normally useful,[36] but potentially limiting, enterprise since it may be accompanied by the supposition that surrounding areas are open for unrestrained exploitation, *notwithstanding the impacts of those activities on relatively untrammelled natural areas*. For example, it may seem that a park area is well protected through regulations aimed at keeping people out of its especially vulnerable core areas. Nonetheless, if the areas outside the core, or those surrounding the park, are perceived as 'recreational' or 'multiple use' areas, the result may be that the conservation of the core areas soon will be merely nominal. (Migrating patterns may become disrupted due to lack of linked protected territories, core areas may be affected by wastes from mining, by silt-clogged creeks due to poor logging practices, or by reduced species diversity due to hunting in adjoining areas, etc.)

Recognizing that the designation and maintenance of certain areas as parks and reserves is a fundamentally *cultural* matter, and noting that the protection of such cordoned-off areas may, by itself, be insufficient to stem environmental degradation of the region, this perspective alerts us to the necessity of self-critically re-assessing in a more general way the cultural givens. So, from this perspective, more than protected status *per se*, natural areas require the development of appropriate attitudes in surrounding residents and visitors.[37] As such, a nature-affirming culture of nature will transform human activities in *all*

[35] Also see Callicott *et al*. (1999) on two contrasting schools of conservation philosophy, one of which treats human beings as separate from, and one of which considers human beings as part of, nature.

[36] As noted, since this perspective allows for the supposition that the natural contrasts with the artefactual, that the contrast may come in degrees, we may legitimately designate an area as natural heritage if its degree of artificiality is low and the designation foreseeably will serve to preserve it from further artificiality. Christopher Preston has pointed out, however, that, in order to make such distinctions in practice, one would need to develop further an epistemology for distinguishing degrees of artificiality and politically defensible cut-off points for areas to be protected from further intervention. (Letter from Christopher Preston, winter 2003)

[37] Also see Heyd (2003) and Heyd (forthcoming).

environments, whether the activities primarily affect areas designated for human use or areas set aside as natural reserves.

Third, the perspective outlined, furthermore, draws attention to the interdependence of *particular* cultures of nature, as they have developed among certain indigenous peoples, and the *conservation* of natural environments as natural heritage areas.[38] It thereby points to the significance of learning from the peoples who have had long-term, diachronic direct contact with natural spaces, have developed local knowledges of their environments (an idea recognized in recent research under the rubric "Traditional Ecological Knowledge"), and have adopted sophisticated ways of respectfully co-habiting with nature.[39] Similarly, it points toward the value we can derive from considering the delicate interplay of appreciative stances involving nature and culture in rock art (traditional petroglyphs and pictographs) and contemporary land art sites.[40]

5. Concluding Remarks

Conceiving of natural heritage as a form of culture of nature points toward continuity of natural and cultural heritage sites. The crucial factor that makes a site more an example of natural rather than cultural heritage consists in the value that one attempts to protect and enhance: the spontaneity of nature *vs*. the spontaneity of human beings. At a site such as Angkor, (besides warding off looters) the efforts of conservationists mostly are directed toward the protection of its buildings and sculptural works from the effects of the tropical rainforest environment. Even though Angkor may be said to aesthetically benefit from the spontaneity of nature, which provides its superb setting, its architectural values are also harmed by the vegetation that surrounds and sometimes engulfs its buildings.

At Yellowstone the situation is reversed: conservationist and preservationist efforts are directed toward the protection of its relatively humanly untrammelled condition. Even while the Park aesthetically benefits from the contrast provided by urbanization in the rest of the country, it is harmed by the effects of its

[38] I am supposing that there is *not* just *one* way of acting toward any part of nature that may be considered appropriate to the task of allowing for the actualization of the specific qualities that it potentially has, though, up to this point, I was speaking of culture of nature in the singular. Rather, such culturing of nature may be carried out in a diversity of ways even if some may be more appropriate to the goal of allowing for the spontaneity of nature than others. (As has been reported, indigenous people have not always managed to find nature-respecting ways before certain species were hunted to extinction, but this does not mean that people with long residence in place have not generally found ways of sustainably living on the land.)

[39] See Heyd (2001) which argues that a diversity of cultural perspectives can be useful in aesthetic appreciation, and hence protection, of nature; also see Heyd (2000).

[40] See Heyd (1999) for an argument that links the aesthetic appreciation of rock art with the development of respect for the natural environment.

special character, which attracts ever more tourists, and by the humanly generated pollutants that reaches it from outside its borders.

Cultural landscapes, such as many of the prairies generated by Native fire regimes in North America, the Sans-Souci gardens in Potsdam, or the rice terraces of the Philippines (recently declared a World Heritage site), constitute examples of a culturing of the *interaction* between nature and human beings.[41] The value that conservationists try to maintain and enhance in such places is a kind of human spontaneity that does *not* overwhelm the spontaneity of nature—but *plays into it*. This is a difficult combination to achieve, but, for this reason, perhaps the more remarkable where it is successful.[42]

In sum, I have discussed the relationship between nature and culture in the context of the preservation or conservation of natural heritage, and concluded that culture need not be conceived as antagonistic to nature. Rather, a nature-affirming culture is possible.[43] Insofar as natural heritage calls for the recognition of, and respect for, certain spaces such as nature reserves and national parks not made through human artifice, natural heritage conservation may be a kind of culture of nature. Moreover, insofar as in certain sites natural and human spontaneity may intermingle in harmonious ways, there also is reason to consider the conservation of cultural landscapes as a form of culturing of nature. A global concern for the integrity of the natural environment can only benefit from attention to the fact that some cultural paradigms may be positive rather than negative factors in the preservation of the non-human world.[44]

Acknowledgements

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[41] For discussion see, e.g., Plachter and Rössler (1971), pp. 15–18.

[42] There is considerable literature out on how to put this idea into practice, beginning with the work of authors such as McHarg (1971) or Schumacher (1973), and continuing presently with diverse proposals on living sustainably. Also of interest in this context are the essays by diverse authors contained in Heyd (ed., 2005), which engage the question whether the spontaneity of nature may be understood in terms of 'autonomy,' and, if so, what this implies for human action (such as agriculture or restoration) that affects non-human nature.

[43] In this paper I did not seek to give an argument for respecting the integrity of natural environments, entities or processes. My intention was, rather, to set the stage for such arguments by sketching the cultural preconditions required for the practical effectiveness of such arguments. See Heyd (ed. 2005), and Heyd (2003) and Heyd (forthcoming) for further thoughts on these matters.

[44] This paper is a slightly revised version of Heyd (2005). An earlier, substantially different, version appeared as Heyd (2002).

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Recommendations to Improve the Environmental Security

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Abstract

In this paper I study the question of the environmental security considering the example of cyanide pollution which was caused by an Australian-Romanian gold mining joint venture (Aurul SA), in Romania, in 2000. From the point of view of the economy, the pollution caused by Aurul SA was a negative externality. The externality is regarded implicitly as an issue of secondary importance in the current economic practice. The effective potential of technology is increasing remarkably and is affecting people who live far away in space (in the other countries) and in time (the next generations). Because of this reason society has to pay more and more attention to these negative effects which exist through non-market mediation. (i) It would be one of the most efficient way to improve the environmental security if the society did face this problem. Enterprises that have overall negative effects can be mainly hindered by local authorities, but we can experience that these authorities do not able to control them. In the developing countries there are only the residents who are unconditionally interested in the environmental security. (ii) Therefore, investments into the periphery should be controlled by local residents and their organizations. So, these organizations ought to be supported internationally. The result of legal action for compensation after the cyanide pollution has drawn attention to the fact that „the polluter pays" principle does not work automatically. (iii) The problem of compensation can be solved if the investors are required to have the necessary insurance protecting nature and civilians. In the present world economic system, the creditor banks are in too advantageous position. In normal conditions banks get back the invested money plus interest. In the case of unusual events causing the bankruptcy of the enterprise, these banks are compensated before the local residents. (iv) Therefore, I suggest that the creditor banks should be compensated after local victims. This simple change could be an advantage both from the point of view of environmental security and of social justice.

Key words: *case study, cyanide pollution, externality, insurance, creditor bank*

Introduction

In Eastern Europe, there is less the environmental security than in Western Europe. The basic cause of this is the differences in cultural development. It is widely known that in Eastern European people have less respect for law, their environmental awareness is lower, the environmentalist organizations are weaker, and usually the social sphere is less important. Further, corruption is bigger, than in Western Europe. These differences should be minimized between western and eastern part of the European Union, but there is no real chance for quick change in this field. Therefore, particular steps which raise the environmental safety are need in this region. These problems are valid for the third world as well, where the environmental safety is even lower than is the eastern part of the European Union. In my paper I would like to study these questions considering the example of cyanide pollution which was caused by an Australian-Romanian gold mining joint venture (Aurul SA), in Baia Mare, Romania, in 2000. This leak of cyanide and heavy metal waste into the Szamos and Tisza rivers led to the pollution of hundreds of kilometres of the Hungarian waterway network.

1. About the importance of the case studies

Part-whole relationships are important in many fields. One common interpretation, dating at least as far back as the Greek natural philosopher Democritus, is that the parts explain the wholes. This is the view of reductionism. The representatives of this view attempt to explain complex phenomena or structures by relatively simple principles. A denial of reductionist ideas is holism or emergentism: the idea that things can have properties as a whole that are not explainable from the sum of their parts. The principle of holism was concisely summarized by Aristotle in the Metaphysics: "The whole is more than the sum of its parts".[1]

According to the holistic authors it means a serious problem that the world or any event of the world is a whole, while both the social practice and scientific life are divided into different parts. The modern society contains different subsystems (economy, law, bureaucracy etc.) as Niklas Luhmann underlines[2], so it is only suitable to treat the different events from these partial standpoints. The same dilemma occurs on the level of scientific knowledge as well. How can

[1] http://en.wikipedia.org/wiki/Reductionism

[2] Luhmann suggested that a society should be characterized by its primary mode of internal differentiation. "Internal differentiation means the way in which a system builds sub-systems, i.e, the difference of systems and (internal) environments within itself. Forms of differentiation determine the degree of complexity a society can attain." Modern society has evolved into a functionally differentiated system, such as, the political system and its environment, the economic system and its environment, the educational system and its environment, and so on. <http://www.n4bz.org/gst/gst12.htm> 2007-02-20

the individual events as a whole be understood by the help of the sciences divided into disciplines? The case study, which is able to comprehend the given problem as a whole, can help to dissolve this dilemma.[3] Certainly, not every individual case is interesting for case study, but only those which are complex, touch a number of disciplines or different subsystems, and contain conflicts of values and interests.

It is particularly frequent in these cases, that the economic standpoint as dominant partial standpoint results a weak outcome. This problem is particularly evident in the case of bioethics or environment protection. The rational thinking of the leaders of society mainly weigh the short-term economic consequences when they are making a decision about an enterprise, while that has usually a significant long-term non-economic (but ecological, ethical, social, political etc.) effects as well. At the same time these long-term negative influences are only partly, if at all perceived within the economic framework. Therefore, one of the important tasks of environmental philosophy is to interpret these cases not only within its own paradigms, but it should try to reflect to the whole issue including its economic aspects, as well.

2. Short description of the cyanide pollution by AURUL S.A.

On January 31st, 2000 the dam of an open cyanide retention pond used by the Australian-Romanian gold mining joint venture company, Aurul SA broke. A huge quantity (100 000 ton) of cyanide polluted water made its way into the stream of Zazar, the Szamos and Tisza rivers into the lower Danube. During its four week journey, the 150 km long toxic tide travelled a distance of 1950 km, flowing through Romania, Hungary, Yugoslavia, Bulgaria, and on into the Black Sea, devastating 1000 km of river ecosystem.[4] Let's consider the next table made by the Greenpeace in June 2002. [5]

[3] http://en.wikipedia.org/wiki/Case_studies, 2007-02-20

[4] *Tisza Cyanide Spill*. WWF Hungary Programme Office.

[5] Mining case <http://archive.greenpeace.org/earthsummit/docs/corpcrimes_3of3.pdf >p.7, 2007-02-20

Table I

Company details	Esmeralda, Perth, Australia Aurul, Baia Mare, Romania Now: Canadian- Romanian Transgold SA
Location of damage	Baia Mare, Romania, Tisza river, Danube river, Hungary. February, 2000
Company activity	Extracting gold out of tailings from former gold mining activities using the sodium cyanide leaching process.
Type of incident	Rupture of dam containing toxic sludge from reexploited tailings on January 31, 2000
Type of damage	Massive pollution of rivers with cyanide and heavy metals such as cadmium, lead, and arsenic
Range of damage, amount of loss	Over 100,000 tons of sludge containing approximately 100 tons of cyanide (plus heavy metals) immediately killed all life in the rivers Lapus and Tisza in a stretch of over 700 kms, mainly in Hungary. Over 1,000 tonnes of dead fish were collected by the Hungarian authorities. Beavers, otters, herons, bald eagles and other wildlife, as well as sheep, goats, cows were killed.
Who is responsible?	Esmeralda, Perth, Australia as main holder (51%) of Aurul, the operating company. Aurul who was owned 44% by the Romanian state, and 5% by private Shareholders. Romanian State and regional authorities. The dam had been built in 1999, out of "too light a material“ against the warnings of local mining experts.[6]
Legal and/or public action taken	The Hungarian government sued the successor of Esmeralda / Aurul, Transgold SA, in order to compensate Hungary with 28 billion Forint (USD 105 million) for the loss in nature mainly. Romania's government filed a case against Transgold. On 14 April, 2002, the court in Cluj Napoca; Romania, ruled that the accident was caused by "force majeure“. Heavy rainfalls had in fact had taken place prior to the event, as they do every year. On the other hand, an expert produced for the court case had stated that the dam had been planned and built in disregard of the regional weather conditions. No appeal to the court ruling is possible.On its homepage the Hungarian government called for better international regulation of such transboundary pollution.
Subsequent behaviour of company	Esmeralda declared itself bankrupt. A new company, Transgold SA, Australia – Romania, stepped in and took up the same activity in spite of the fact that Romanian authorities had not yet issued a final permit.[7] Instead of starting to clean up the polluted land near the facility, the company bought the land and surrounded it with a second dam claiming that this would prevent a similar accident in the future.[8]

[6] For a full report on the accident, local conditions and background, see: Bernstorff, Andreas and Judit Kanthak: The Real Face of the Kangaroo, Greenpeace 2000;

[7] European Union Baia Mare Task Force

[8] MIT (Hungarian Press Agency)

All in all, Hungary has suffered —according to its own figures—a damage of $105 million[9] as a consequence of the cyanide pollution.[10] This amount consisted of two parts, the bigger part was the ecological damage, while the smaller one (14,5-16,5 million USD[11]) was the direct economy damage of the Hungarian state. This amount did not contain the damage of the private people (fishermen, caterers), which reach 7-10 million USD[12]. The polluting firm stopped its operation, but half a year later it started again with few environmental improvements.

The EU established a committee (The Baia Mare Task Force, 06/03/2000) to investigate the causes and the consequences.[13] According to the report, the accident was caused by mistakes in the design and the execution of the dam, but the control over the work of the company was not proper either.[14] Bad weather promoted the catastrophe, but it could not have caused such a large-scale damage in itself, the experts concluded.

Hungary started two lawsuits. Private individuals want to claim $8,69 million[15], while the state is suing for 105 million dollar from the Aurul SA in 2001.[16] A Hungarian court decided in 2005 October to reduce by 85 percent of the production of Australian-Romanian mining company. The decision was final.[17]

The Transgold (before Aurul) SA declared itself bankrupt at the end of March in 2006. Later on (24-nov-06) the KazakhGold Group Limited (London: KZG) announces that, together with AIM-listed Oxus Gold, has successfully bid US$6.99 million (inclusive of US$1.12m VAT) in open auction for the assets of a gold project in Romania that were put into in liquidation in April, 2005. The newly formed 50:50 joint venture, Romaltyn, expects to recommission the project and bring it back into production in approximately six's months time. The project offers the potential to generate a rapid return on investment and provides an opportunity for exploration and development of additional resources in the area.

[9] 29.37 billion HUF

[10] MTI Budapest, 07. 10. 2000.

[11] 3,5-4,6 billion HUF

[12] 2-3 billion HUF

[13] http://ec.europa.eu/environment/press/baiamare000306.htm

[14] BMTFR. Report of International Task Force for Assessing The Baia Mare Accident, UNEP/OCHA, December 2000.

[15] 2.3 billion HUF

[16] Magyar Nemzet 8.09. 2000. *Újabb keresetek vidéken is*

[17] http://www.nol.hu/cikk/361069/

On 29 November 2006 the Cluj Napoca court refused the Hungarian claim that the Hungarian State should be on the list of creditors of Transgold SA.[18] So the chance that the Hungarian State will receive a share of compensation has remarkably decreased. [19]

In the next table I'll try to summarize some important economic features of enterprise of the Aurul SA.

Table II

Aspects	Economic features of investment
the name of the firm	Aurul (later Transgold) SA
the beginning of the project	1992[20]
getting operation license	May, 1999 [21]
the expected time of mining:	Gold: 9,68 year , silver: 7,83 year
deposit utilised each year and for the whole project	2,5 million ton/year[22] and 22,5 million ton[23]
gold mining each year and for the whole project	52 000 ounce/year (1,6 ton/year) and 500 000 ounce (15,5t).[24]
silver mining per year and for the whole project	280 000 ounce/year (8,7 ton/year) and 2,2 million ounce (68,2 ton) .[25]

[18] Erdélyi krónika 2006-11.29 AND hírtv <

http://www.hirtv.hu/?tPath=/kulfold/hethatar/&article_hid=126872>

[19] http://www.mno.hu/index.mno?cikk=385485&rvt=117&s_text=ci%E1nper&s_texttype=4

[20] Népszabadság 2000. 02. 18., 2. o.

[21] Népszabadság 2000. 02. 18., 2. o.

[22] *Ciánszennyezés Baia Mare-n,* 2000. 06. Paul Csagoly (ed). Budapest, 2000 Június, Regionális Környezetvédelmi Központ (REC), [This Hungarian brochure was based on Report of International Task Force for Assessing The Baia Mare Accident, UNEP/OCHA, December 2000.] AND Népszabadság 2000. 02. 18., 2. o. *EU Parlament: környezetvédelmi könnyítés nincs*

[23] Népszabadság Online 2005. május 3.

[24] *Ciánszennyezés Baia Mare-n,* 2000. 06. REC. AND Népszabadság 2000.02.18.; 2.o.

[25] *Ciánszennyezés Baia Mare-n,* 2000. 06. REC. AND Népszabadság 2000.02.18.; 2.o.

complete cost of investment:	28,2 million USD[26]
value of the bank loan:	On the whole 17 million USD from the English NM Rothschild Australia Ltd and the German Dresdner Kleinwort Benson bank
the expected average selling price, production cost and profit of one ounce golden	300 USD/ounce, 210 USD/ounce[27] (according to the other sources 180 USD/ounce[28], 90 USD/ounce, respectively)
expected profit from gold each year and for the whole project	52 000 ounce/year * $90= 4 680 000 USD/year.[29] 9,68 year * 4 680 000USD/year = 45 302 400 UDS. [30]
profit expected for a year and for the whole project	5 million USD/year and 48 million USD

The Baia Mare pollution can be interpreted in two different ways. We can consider it a problem of cyanide mining technique and water pollution. In this case, we should concentrate on concrete industrial, technological and water problems. On the other hand, we can consider it a typical international investment where a firm from the developed countries (like Australia) using the international bank loan imports an outdated technology into a developing country (like Romania). This process is often regarded environmental exploitation or colonization by the environmentalists. In this article I will concentrate on the latter problem that is general practice and faults of the international investment, and I sketch some suggestions to reduce the environmental risk.

3. Overall negative enterprise

From the point of view of the economy, the pollution caused by Aurul SA was a negative externality. The concept of an externality is central issue for environmental economics.[31] We can speak about externality if the economic

[26] Vasárnapi Mai Nap 2000. 05. 14. *Vizválasztó,* AND Világgazdaság 2000. 05. 15. *Aurul környezetvédelmi vállalkozás?*

[27] http://www.wazzupnet.com/

[28] Figyelő 2005. január 13. Verespatak: levélváltás aranyügyben

[29] Gold mining each year (52 000 ounce) multiplied by the expected average profit ($300-$210= $90) of one ounce gold.

[30] The expected time of gold mining (9,68 year) multiplied by the expected profit from gold each year (4 680 000 USD).

[31] http://en.wikipedia.org/wiki/Environmental_economics, 2007-02-20

activity in question involves participants (third parties or stakeholders) who do not take part in the market transaction.[32] In this case we are faced with the danger that advantages arising from (direct) market activities are enjoyed exclusively by market actors (e.g. owners, managements, workers, consumers), while the disadvantages are suffered by indirect or non-market actors (particularly local residents).

The externality are regarded implicitly as issue of secondary importance in the current economic practice.[33] Economic experts think that direct advantages (i.e. profit of the owners) or indirect advantages (i.e. creation of jobs or satisfaction of consumers needs) always exceed the negative effects of an enterprise which local residents are involved mainly. In the past this opinion might be true. However, a new situation has developed with the modern technology, as Hans Jonas emphasized.

(In the past) *"The good and evil about which action had to care lay close to the act, either in the praxis itself or in its immediate reach, and were not matters for removing planning. This proximity of ends pertained to time as well as space. The effective range of action was small, the time span of foresight, goal-setting, and accountability was short, control of circumstances limited. The long run of consequences beyond was left to chance, fate or providence. Ethics accordingly was of the here and now, of occasions as they arise between men, of the recurrent, typical situations of private and public life. … The short arm of human power did not call for a long arm of predictive knowledge; … All this has decisively changed. Modern technology has introduced actions of such novel scale, objects and consequences that the framework of former ethics can no longer contain them."* [34]

The effective range of technology is increasing remarkably and is affecting people who live fare away in space (on the other countries) and in time (the next generations). Because of this reason economics has to pay more and more attention to these negative effects which exist through non-market mediation. Additionally the value loss coming from those negative effects exceed the positive effects which come through market processes. For this reason I suggest that such an endeavour should be called 'enterprise having overall negative effects' or shortly '*overall negative enterprise'*. Let's us make distinction between the 'negative enterprise' and 'overall negative enterprise'. The former

[32] http://en.wikipedia.org/wiki/Externality2007-02-20

[33] Economists often assume that the positive and negative externalities are balancing each other on social level, and that externalities in the private economy are insignificant. Laisset-fare economists such as Friedrich Hayek and Milton Friedman refer to externalities as "neighborhood effect". Externalities may, however, be neither small nor localized. http://en.wikipedia.org/wiki/Externality 2007-02-20

[34] Hans Jonas: The Imperative of Responsibility. The University of Chicago Press Chicago & London 1984. pp. 5-6

notion just takes the direct market factors into consideration. Economists label a company with "negative enterprise value" when cash and marketable securities exceed their stock market value and long-term debt combined. Theoretically, you could buy one of these companies, pay off its debt and still have more cash than you paid, thus turning a profit. This gives an opportunity for so-called vulture investors.[35]

In the latter notion the word 'overall' emphasises that we consider not only the direct market effects, but every indirect and non-market effects, as well. (A practical difficulty can arise at this point. Namely, it is difficult to compare market effects which can be denoted in money and are more or less calculable with non-market effects which cannot be denoted in money and are contingent. For instance, the owner's expected profit, which is almost sure, can not be simply compared with health damages of inhabitants caused by the unexpected pollution.) Two groups of the overall negative enterprises can be distinguished. On the one hand, those which are negative from the viewpoint of market as well are not interesting as loss making companies do not come into existence. On the other hand, those which are profitable from the viewpoint of market represent a very important and dangerous group. This group can be called overall (or socially) negative but profitable enterprises.[36] However it seems, that the leaders of the society and economy are not aware of (or ignore) the fact that such type of enterprises can exist. It would be one of the most efficient solution to improve the environmental security if the society did face this problem.

The operation of Aurul SA clearly shows that such enterprises do exist. The pollution caused by Aurul SA involved about 1.5 million people to some extent. The spilling of the cyanide waste caused 109 million dollars worth of damage to the Hungarian State and it caused 3 million dollars worth of damage to the people who live by tourism and fishing. Had it been as intentioned this enterprise would have had a profit of 5 million dollars a year for investors and would have only given jobs to a few dozen people.[37] Unquestionably the value of the negative externality exceeded significantly the positive market effects of this company.

In spite of this fact the operation of the company launched because different actors had been involved in the expected advantages and disadvantages. The unfair distribution of risks and opportunities is one of the main reasons for environment pollution. The advantages of the company are dominant for direct and active participants (i.e. investors, managers, workers, officers in the local

[35] Kathleen Pender: Sailor seeks cache of dot-com cash. San Francisco Chronicle Sunday, May 26,

[36] Beside environmental polluting companies tobaco corporations could be mentioned.

[37] János I. Tóth: Tiszai ciánszennyezés, Szeged, 2002 p. 47.

government), while the disadvantages are dominant for indirect and passive agents (i.e. the residents who suffer from pollution). From the viewpoint of the general welfare (common good) these types of enterprises are totally unacceptable, since globally they cause more harm than good. The ethical point of view is more strict, because it covers the principle of 'do not harm'– which is a universal ethical principle – saying that nobody can be harmed without his/her approval or compensation.

Returning to the given example, who could have prevented this undertaking or could have forced the firm to work safely? Theoretically there are a number of potential economic means of improving overall social utility when externalities are involved. It seems that an efficient means of solving externalities is to "*internalize*" the costs. For example, by requiring a polluter to repair any damage caused. In many cases, however, internalizing costs is not feasible or the costs are uncertain. [38] This is just the situation in the case of Aurul/Transgold SA. Ronald Coase argued that participants (stakeholders) could organize *bargains* so as to bring about an efficient outcome and eliminate externalities without government intervention.[39] However the Coase theorem does not apply in the case of Aurul/Transgold SA. Practically it is difficult – if not impossible – for large number of victims of the disaster to negotiate with the firm and there are large transaction costs.

Since the effect of this environmental pollution comes through non-market mechanisms, mainly non-market forces (i.e. local and state environmental inspectorships, green organisations, the cooperation of inhabitants) could have prevented it. However, these are precisely the forces which are not effective in Eastern Europe. On the one hand, because of the historical reasons which have been mentioned; on the other hand because this region has shown exaggerated confidence in neoliberalism after the fall of communism. For example in Hungary, the rate of the state property is significantly lower than in Western-Europe.

Enterprises that have overall negative effects can be mainly prevented by local authorities, but we can experience that these authorities do not able to stop them. The Romanian state was keenly interested in making Aurul SA work with the highest possible output. First, by means of the Remin, the state was a share holder in the company selling precious metal represented income for the country in dollars. Second, the Aurul SA paid a 3% concession fee to the state. Third, the mine as an employer and tax-payer enjoyed the support of the local government. These special interests explain why the environmental authority of the state and of the region did not control the Aurul SA more severely, as stated in the Baia

[38] http://en.wikipedia.org/wiki/Externality

[39] http://en.wikipedia.org/wiki/Externality

Mare report.[40] As is often the case in a developing country, most of the agents (investor, receiving state, local authorities) did not represent environmental interests, so foreign investments represent an increased environmental risk and threat to the region. In the developing countries there is only one actor, the resident who is unconditionally interested in the environmental security. If we want to avoid such accidents, investments into the periphery should be controlled by local residents and their organizations should be supported internationally. This is one chance to improve the environmental security of this region.

4. Compulsory insurance

Environment pollution is often not only the result of simple human or technological error that can happen any time, but the outcome of rational cost-expense calculation. Within the given conditions, the appearance of pollution is never fully predictable, only its high probability can be foretold; moreover, the obligation to pay damages only follows pollution with a well-defined probability. The two probability values are independent of each other; consequently the probability of the obligation to pay damages is very low mathematically. Therefore, firms consider it much more reasonable to risk pollution than to invest into equipment to prevent it.

Considering these factors, it is no wonder that environment disasters occur so frequently all over the world, since market interests and conditions encourage firms to work with the highest possible environmental risks. Environmentalists remind us that it is often cheaper for these companies to take risks than to invest into environment protection. Society, of course, has numerous ways to force these firms to obey environment protection laws: the proper formulation of rules, the harsh punishment of rule-breakers. Compulsory insurance may be an additional way to resolve this problem.

The result of legal action for compensation after the cyanide pollution has drawn attention to the fact that "the polluter pays" principle does not work in transboundary situation. The present world economic system and international law have serious shortcomings if the "polluter pays principle" cannot be imposed in a situation as obvious as Aurul/Transgold SA. This problem can be solved if the (international) investors are required to have the necessary insurance protecting nature and civilians. This way, in case of a disaster the insurance company would be able to pay the victims immediately. The necessity of this is shown by the case of Aurul SA, which did not pay any compensation to the Hungarian state or individuals, although seven years have passed. Based on the legal proceedings, this won't happen any time soon. A further advantage of this alternative solution would be that the insurance company could exert the

[40] *Cián szennyezés Baia Mare-n*, June 2000, REC.

necessary pressure on the companies to reduce the environmental dangers. Introducing compulsory insurance could raise environmental security in and of itself.

"Interesting security mechanisms are the Swedes and Finnish Environmental Damages Insurances (EDI). In both countries, compulsory insurance provides compensation in the event the liable party is insolvent, when a tort claim is precluded by prescription or when the source of damage remains unknown. Essential is that the EDI only provides compensation to third parties remaining uncompensated in the event of insolvency of the insured. It is not liability insurance. It can be analyzed as a direct (casualty) insurance take out by the operator for the benefit of unnamed third parties. EDI does not protect the insured himself against liability. The insured cannot present claims the insure."[41]

Unfortunately Aurul SA only had insurance to cover the Romanian citizens. However Hungarian citizens have suffered considerable damage as a consequence of the cyanide pollution caused by Aurul SA. Therefore all the inhabitants of the European Union could benefit by the compulsory insurance system in the same way regardless of the country they live in.

5. Putting the claim of the creditor banks behind

In this region which lacks capital, the big investments are almost always made with the help of foreign creditor banks. In the case of Aurul the investment was financed with 11.2 million dollars of the capital from Aurul and with a 17 million bank loan from Rothschild in Britain and Dresdner Kleinwort Benson in Germany.[42] According to the present system, creditor banks have an too advantageous position. In normal conditions banks get back the invested money plus interest. In the case of unusual events causing the bankruptcy of the enterprise, these banks are compensated before the locals. (This order is obviously based on the tacit assumption that the creditor bank hold no responsibility whatsoever for the activity of the firm it finances. If the creditor bank were held responsible to any extent, it would mean that it would not only

[41] Economic Commission for Europe. Meeting of the parties to the convention on the protection and use of transboundary watercourses and international lakes. http://www.unece.org/env/documents/2002/wat/ac3/mp.wat.ac.3.2002.wp.23.e.pdf, 2007-02-20

[42] Vasárnapi Mai Nap 14. 05. 2000. *Vizválasztó* AND Világgazdaság 15. 05. 2000. *Aurul környezetvédelmi vállalkozás?*

have to be excluded from the line of those who claim compensation, but it should also be compelled to pay compensation.)

This practice is not only unjust but disadvantageous from the point of view of environmental security. In my opinion, the creditor bank should be compensated after local victims who should be the first to get ~~a~~ compensation. This simple change could be an advantage both from the point of view of environmental security and of social justice. The banks would consider whether or not to finance the uncertain enterprises more carefully and they would emphasise the secure operation of the firm to a greater degree. This change would harmonise with social justice as well, because the locals are not at all liable for the environmental pollution.

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Animal Ethics and Process Thought

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Abstract:
This paper develops the growing field of animal ethics by engagement with the process philosophy of Alfred Whitehead. Process thought must be understood as a reaction to the two ontologies (theories of reality) that have dominated Western philosophy: classical materialism and dualism. In classical materialism, nature is carved up into bits of matter. These bits are understood to be inert, lifeless, and devoid of creativity. Dualism shares this understanding of reality with classical materialism, yet allows for one exception: the realm of the mind. While both classical materialism and dualism can be, and have been criticised for failing to provide an adequate understanding of reality, they have also been used in the development of arguments aimed at justifying unacceptable forms of animal exploitation. The alternative of panexperientialism provides not only a better way to understand reality, but can also inspire the development of an animal ethic that harmonises many people's feelings about the treatment of nonhuman animals with appropriate justifications. A new animal ethics is proposed and distinguished from earlier work carried out by Whiteheadian process thinkers in this field, primarily through a discussion of vegetarianism. It is my hope that this paper will contribute to the development of a global ethic of non-violence and a reduction in the use of violence against animals.

Keywords: *vegetarianism, Whitehead, diet, classical materialism, dualism, panexperientialism*

Introduction

In a classical materialist ontology, the world is understood to be a collection of objects without subjective experiences or mind-like properties. Without the existence of subjects, all changes in these objects are taken to be changes that occur by forces that operate from the outside, for example gravity. Changes are not caused by inner decisions. Since subjects do not exist, it is quite clear that they cannot make decisions either. Whitehead described the essence of this way of thinking about the world, which increased in popularity since the advent of modern science in the seventeenth century, as follows: 'In itself (matter) is senseless, valueless, purposeless. It just does what it does, following a fixed routine imposed by external relations which do not spring from the nature of its being' (Whitehead, 1985: 22). Any changes that occur would not affect the ways in which things are constituted internally, but only their relative locations. A good way to imagine what the world is supposed to be like for a classical materialist is to think of it as a billiard-ball universe. This old metaphor captures the central idea rather well: billiard balls are supposed to remain the same throughout time; only their locations change under the influence of an external cue; the balls do not change each other's internal constitution, but are only externally related to one another. What must be forgotten about when this metaphor is used, although, is that for a classical materialist there is no intelligent designer seeking to impose some order by carefully applying their cueing skills. For a classical materialist, the world is more like a billiard-ball game without players, where the balls clash with one another in a random fashion. Even the evolution of simple matter into what looks like more complex matter is understood to be a mere reshuffling, driven by causes that operate blindly. There is no room for free will or inner decision-making. According to Michael Ruse, for example, what people call 'free will' is in fact not 'free' at all, but an 'illusion fobbed off on us by our genes', the deterministic outcome of what the interaction between genes and environmental factors imposes on us (Ruse, 1993: 506).

Dualists are not satisfied with this scheme of things. Their contention is that there is no reason why our sense of free will should be explained away or belittled like that. Their strategy is to rescue the baby from being thrown out with the bath-water. This results in a splitting up of reality. In a dualist ontology, the existence of two fundamentally different and separate domains of reality is affirmed: the realm of material substances and the realm of spiritual or mental substances. While change in the former realm is explained by reference to the deterministic laws of nature, change in the latter realm is described by reference to internal forces such as the activity of free will. While the material things are the passive products of change, the mental things can actively change themselves. The greatest problem for such a view is to explain our experiences of interaction between these two supposedly separate domains.

While the choice to adopt either classical materialism or dualism must not necessarily be accompanied by a choice to support a strong anthropocentric ethic, it is fair to say that both have encouraged a strong anthropocentric attitude whereby the value of nonhuman nature is conceived primarily or solely in terms of its resource or instrumental value for human beings. In a classical materialist framework, nature is pointless, so there is no point in arguing for an animal ethic. In a dualist framework, the realm of the spiritual beings, or those beings who possess a mind, has frequently been held to be populated only by human beings, apart from God, gods, or god-like beings. Human beings are then considered to be gypsies on a planet that is wholly devoid of any features that bear any similarity to the human soul. This has often been accompanied by the view that humans have a God-like or supernatural status, free to use nonhuman animals at whim to support the spiritual journey of the human soul. What both classical materialism and a dualism which strongly separates humans from the nonhuman world have in common is an inability to conceive of nonhuman animals as subjects in their own right, who may have value apart from their instrumental value. An extreme example of this mind-set is provided by Peter Singer where he recounts an eyewitness account of what happened in the Jansenist seminary of Port-Royal in the late seventeenth century: 'They administered beatings to dogs with perfect indifference, and made fun of those who pitied the creatures as if they felt pain. They said the animals were clocks; that the cries they emitted when struck were only the noise of a little spring that had been touched, but that the whole body was without feeling. They nailed poor animals up on boards by their four paws to vivisect them and see the circulation of the blood which was a great subject of conversation.'(Singer, 1990: 201-202).

An alternative to classical materialism and dualism is process philosophy. Indeed, process thought, which relates mainly to the works of Alfred Whitehead (1861-1947), Charles Hartshorne (1897-2000), and the works of an increasing group of scholars who have drawn inspiration from them, must be understood as a reaction against classical materialism and dualism.[1] Whitehead was convinced that 'the whole concept of materialism only applies to very abstract entities, the products of logical discernment', but that 'the concrete enduring entities are organisms' (Whitehead, 1985: 98). While it has been fashionable to think of bits of matter as if they were machines, Whitehead challenges us here to think of things in terms of organisms. An alternative name for process philosophy, incidentally, is the 'philosophy of organism'. Referring to Descartes, Whitehead argues that the notion of 'substance' as that 'which requires nothing but itself in order to exist' is inappropriate as a category to understand the world (Whitehead, 1930: 94). Instead, Whitehead thinks the world should be seen as a collection of what he called 'actual occasions', 'actual entities', or 'drops of experience' (Whitehead, 1978: 14). Since we do not know what other things are like in and for themselves, Whitehead

[1] The central tenets of process thought are summarised in Griffin, 2001, p. 5-7.

suggests that we understand them by analogy with what is revealed by examining the only thing that we know from the inside: our own experience. From our experience of ourselves, we know that we are agents capable of making free decisions, but not without being influenced by others. This relational character of reality must be emphasised, yet relationality presupposes individuality. Each presently existing actual entity is, to some extent, determined by past actual entities in what Whitehead called its 'prehension' ('taking account of' or 'feeling') and is itself, by virtue of its own creativity, determinant, to some degree, of the prehensions or feelings of future actual entities. The classical materialist and the dualist are both right, at least to some degree. While Whitehead disagrees with the classical materialist view that things are what they are because of external forces, he agrees that external forces play their part in constituting things. And while Whitehead disagrees with the dualist view that decisions are made in the absence of external constraints, he agrees that decisions are not determined by external forces. The assumption that the capacity to experience applies to everything need not imply that all experience is conscious. Whitehead regards non-conscious experience as being more fundamental, hence the more generic term of 'prehension'. The process thinker Peter Farleigh, for example, uses the observation that we do many things 'without thinking' and that our decisions are often affected by 'forgotten' or 'suppressed' memories as indicative of the continuity between conscious and non-conscious experience (Farleigh, 1997). While Whitehead neither accepted nor rejected the notion of 'panpsychism' to mark his philosophy, some have used the term to refer to his position.[2] My preference is to use David Griffin's notion of 'panexperientialism', for the following two reasons. Firstly, the word 'psyche' in 'panpsychism' suggests experience at higher levels, which could be called 'mind' or 'consciousness', which may not be present in all actual entities. As mentioned, panexperientialism does not entail that a neuron, for example, has consciousness, but only that it has experience. A second reason is that the notion of 'psyche' has often been understood as presupposing an enduring substance, clashing with Whitehead's view that the ultimate units of nature are momentary (Griffin, 1998: 78). Indeed, Whitehead tries to do justice to his perception that the character of reality is evolutionary, rather than static, by positing that the actual entities are not enduring, but terminate their subjective process of 'self-creation' within the smallest unit of time, to become objectified and used as data for consecutive actual entities (Whitehead, 1978: 69). Or, in the words of David Griffin: 'The salient point is that each enduring individual, such as a living cell or a human mind, oscillates between two modes of existence: the *subjective* mode, in which it exerts final causation or self-determination, and the *objective* mode, in which it exerts efficient causation upon subsequent events' (Griffin, 2001: 6). Things which appear to last or endure are in reality temporal chains or societies of actual entities that have similar forms. These are frequently jelled together to

[2] An example is McHenry, 1995.

constitute spatiotemporal societies, for example in the shape of stones, trees, or dogs.

The experiences that can be found in stones, trees, dogs, and other societies of actual entities, however, are qualitatively different. This relates partly to the fact that some societies of actual entities are organised in such a way as to give rise to a dominant, regnant, or presiding member, while others are not. Hartshorne introduced the concept of 'compound individuals' to refer to societies where such presiding members are present (Hartshorne, 1972). A stone lying on a desk, for example, does not have a presiding member, and therefore does not have internal relations with the desk, but the actual entities which compose the stone are internally related to the (objectified) particles constituting the desk. But while a stone is an aggregational society of actual entities (lacking overall experiential unity), a contrasting example is a living cell, which has greater unity than the organelles which compose it, constituting a higher level of experience than the experiences of the organelles. Not only the organelles (and the smaller units composing them) have internal relations with their environment, but also the cell as a whole. The cell is a unit at a higher level with its own, more intricate internal relations. Although its experience is partially dependent on the existence of organelles, the cell as a whole can also influence the organelles. This is the truth behind downward causation or the saying that the whole is greater than the sum of its parts for all true individuals (as opposed to aggregational societies), or Whitehead's dictum that 'the many become one, and are increased by one' (Whitehead, 1978: 21). The difference between frogs and stones, and more generally between compound individuals and aggregational societies, could also be described in terms of frogs having feelings and stones having feeling in them. Process philosophers also perceive that there are qualitative differences in experience between different organisms with presiding occasions, an issue that will be examined in what follows. My focus will be on developing an animal ethic by critical engagement with some prominent process thinkers who have written on the subject and who have, like myself, drawn their inspiration mainly from the work of Whitehead.[3]

Why Care About Nonhuman Animals?

While an important resource for the study of animal ethics in process thought is Jay McDaniel's book 'Of God and Pelicans. A Theology of Reverence for Life', it is appropriate to start our treatment of this matter with a statement by John Cobb as I believe it provides a good illustration of what drives many process thinkers who have written on this subject. In his introduction to McDaniel's book, Cobb writes: 'Hundreds of millions of suffering animals cry out to the Christian community to pay attention and to care' (McDaniel, 1989: 12). Three

[3] Contrary to the writings of Whitehead, many of Hartshorne's writings deal explicitly with the field of animal ethics. For an overview and critique, see Dombrowski, 1988.

claims are made here: firstly, that lots of animals are suffering, secondly, that they 'cry out to the Christian community', and thirdly, that Christians should 'care'.

With regard to the first claim, McDaniel points at evolutionary theory, neurophysiological, biochemical, anatomical, and behavioural evidence to support the view that nonhuman animals have capacities to feel pain (McDaniel, 1989: 64-65). I shall not recount this evidence here as I think this claim is well-established now. The point made by Cobb, though, is not only that animals can suffer, but also that they 'are suffering', and that it concerns millions of animals. Outside its context, this comment could be perceived as rather banal. Since many animals cannot live without some degree of suffering, the point could be made that, as long as animals keep on being born, at least some suffering is unavoidable. There is no doubt, though, that Cobb's remark relates to the suffering which humans impose on nonhuman animals. In that respect, not much has changed since the publication of McDaniel's book. Indeed, the matter has become significantly worse in terms of the numbers of animals that are affected. While some developed countries have now passed legislation to improve animal welfare, the global demand for meat has grown rapidly in recent decades. In most, if not all, countries, the issue of farm animal welfare is still being ignored or neglected. This takes us to the second and the third claim. The second claim could be interpreted in two ways. One interpretation is that the suffering nonhuman animals Cobb has in mind 'cry out' to the Christian community because they know, having reflected on it, that this community might do something about their suffering. If Cobb's claim is understood in this way, it would presuppose the existence of a developed sense of self-awareness in nonhuman animals. Yet it could be doubted if there are nonhuman animals with this level of self-awareness. Another way to interpret Cobb's point is to think of this 'crying out' as similar to the way in which a human infant cries out to its parents. Like the infant, animals may signal their distress in the hope that it will be relieved, yet without being able to contemplate doing this as an active strategy directed to someone in particular. I believe it is not controversial to conclude that some nonhuman animals are capable of this. A third interpretation is metaphorical. To give a different example, someone might say that 'the environment is crying out to be treated with respect', which should not be taken literally, but merely to make the point that humans should take environmental issues more seriously. Therefore, Cobb might simply be making the point that humans should show more respect for nonhuman animals. This takes us to the third claim, which sums up the central issue that will be examined in this paper: that Christians should 'care'. A first remark that must be made is that Cobb's use of the word 'Christians' is not intended to exclude others. It simply concurs with McDaniel's primarily intended readership. The same holds true for McDaniel, who is more explicit, however, by stating that 'even if there were no God, individual living beings would deserve our respect' (McDaniel, 1989: 67). Several questions are raised by this. A first question is if we should care more

about animals than about plants. A second question is if care involves refraining from inflicting suffering on organisms capable of suffering, or if it involves also giving them a right to life. A third question relates to the relevance of Christianity in this debate. My focus in this paper will be on the first and the second question.[4]

With regard to the first question, process philosophers generally think that plants deserve less moral significance than animals. McDaniel, for example, argues that 'a plant cell's aim to survive – much less to survive with satisfaction – does not seem to be as great as that of a porpoise's interest in surviving with satisfaction', and that therefore 'instrumental considerations being equal, it is more problematic to take the life of a porpoise than a simple plant' (McDaniel, 1989: 69). While I agree with McDaniel's conclusion, doubt could be expressed about its justification. First of all, it is significant that McDaniel focuses on plant cells rather than on plants. Many process philosophers, including McDaniel, have shown agreement with Whitehead where he argues that plants are democracies, lacking presiding occasions.(Whitehead, 1978: 108; Whitehead, 1933: 264). However, this can be doubted. As plants have overall unity, the possibility that they possess a dominant occasion which presides over all subordinate occasions cannot be excluded, in a similar way to which animals possess a sense of self which exerts control over the whole animal. Therefore, a plant as a whole may possess a stronger 'aim to survive' than the cells which compose the plant. McDaniel grants this point, at least in part, writing that 'more complex plants such as angiosperms may have the beginnings of a psyche' (McDaniel, 1989: 79). We could also question if a plant's aim to survive is not as great as that of an animal's. I am writing this paper whilst sitting next to my tomato plants which are growing (happily?) on the window sill. Recently, I pricked my young tomato plants out off the tray in which they were growing to replant them individually into pots. What always amazes me when I do this is that, when I accidentally sever a plant from its roots, the stalk is able to grow new roots after being replanted. Would this support the view that tomato plants (or the urge to live that may be present in each of its cells), as well as (some) other plants, have aims to survive that are equally strong as those of animals? It is clear that most animals do not have the capacity to regenerate like that. The different parts which compose the bodies of animals are too specialised to allow for that. The different parts of animal bodies are more integrated, and must remain sufficiently integrated for the animal to survive. This demands a greater ability to coordinate these different parts, presupposing a greater awareness of these different parts. Therefore, while plants might be as concerned about survival as animals, McDaniel may be right that they are less concerned about 'surviving with satisfaction' compared to animals. While neither plants nor nonhuman animals might be able to reflect on the fact that they are trying to survive, animals may be more aware about their concern with survival, and may

[4] For the third question, see Deckers 2004.

feel the lack or presence of conditions necessary for their survival more than plants. Some animals can even be observed to show clear expressions of sadness and joy (or satisfaction) associated with the presence or lack of conditions suitable for their survival. McDaniel's view that different organisms have different capacities to survive with satisfaction is shared by many process philosophers. Whitehead spoke of different intensities of feeling, or differences in 'strength of beauty'. A more widely used concept is Cobb's notion of 'richness of experience'. This enables us to answer the first question: Most process philosophers think that, instrumental considerations being equal, animals deserve priority over plants since relatively greater moral significance must be attached to those organisms with the greatest capacities for richness of experience.

In the remainder of this paper, I shall focus on the second question raised by Cobb's remark, the question if caring for animals only involves a prima facie duty not to inflict suffering on them, or if it involves also giving them a prima facie right to life. To address this question, I shall examine the arguments which some well-known process philosophers have developed both for and against vegetarianism. This is motivated by a number of considerations, including the following. Firstly, I believe such an examination will help us to address the issue under scrutiny. Secondly, while vegetarianism has been discussed by process philosophers, I believe a critical analysis of the arguments which have been proposed both for and against its appropriateness is much needed. And finally, what might sound like a rather abstract question for many people, the issue of how to decide on how nonhuman animals should or should not be treated, becomes a more concrete, practical reality only when they have to make, and are prompted to think about, their concrete, everyday decisions about what to eat. It is my hope that my analysis will contribute to appropriate decision-making on this issue.

Vegetarianism and Whiteheadian Process Thought

While Whitehead was not a vegetarian, he might not have been consistent with his philosophy by choosing not to be. The reason why this conclusion is justified relates to a paragraph in his *magnum opus*, 'Process and Reality', where Whitehead makes a few remarks that bear on food ethics. Whitehead writes that when living organisms use other living organisms as food, these other organisms are dissolved 'into somewhat simpler … elements'. He continues that in this process that which is used as food 'has been robbed of something' (Whitehead, 1978: 105). I presume that what Whitehead means here is that living organisms die once they are used as food by other organisms, a process whereby more complex organisms are reduced to simpler organisms. Whitehead then proceeds by writing that this is where 'morals become acute' as 'the robber requires justification' (Whitehead, 1978: 105). This remark only makes sense provided a distinction can be made, under a given, right set of circumstances, between two

categories of organisms, those which one can justifiably eat and those which one ought not eat. While Whitehead does not state explicitly what these categories are, he wrote: 'The living society may, or may not, be a higher type of organism than the food which it disintegrates' (Whitehead, 1978: 105). The example which Whitehead provides of such a living society is an animal. Therefore, Whitehead recognises that there are animals who eat other animals as well as animals who eat plants (as well as animals who eat both), and that when the animal in question is a human being, the choice of what to eat becomes a moral issue. The sheer fact that Whitehead takes the trouble to mention the trivial fact that either higher or lower organisms can be eaten suggests that the choice of what or whom to eat becomes important when the 'living society' in question is a human being. Therefore, it is quite probable that the question of why the issue of food choice was a moral issue for Whitehead can be resolved as follows: Whitehead thought that, given the choice (under a given set of helpful circumstances) between eating relatively high organisms and eating relatively low organisms, a preference must be given to the latter. We can only speculate why Whitehead did not act accordingly.

Like Whitehead, the most well-known account on environmental ethics by process thinkers, the book with the title 'The Liberation of Life', written by Charles Birch and John Cobb, does not support vegetarianism. Rather, Birch and Cobb support Jan Narveson's view that 'raising animals for food can be justified if "the amount of pleasure which humans derive per pound of animal flesh exceeds the amount of discomfort and pain per pound which are inflicted on animals in the process"'(Birch and Cobb, 1984: 156; Narveson, 1977: 173). The criterion of richness of experience is no longer used here as a method to determine who matters the most when a choice between sacrificing different organisms must be made. Instead, it is used as a criterion to balance the benefit measured in units of pleasure for one being against the cost measured in units of pain inflicted on another being. Indeed, some people might claim that they derive a whole lot of pleasure out of eating nonhuman animals. Birch and Cobb think, though, that the 'pain and discomfort' of some animals cannot be outweighed by human pleasures that might be derived from eating them. A distinction between two categories of animals is made, where chickens are chosen to exemplify one, and porpoises and chimpanzees the other category (Birch and Cobb, 1984: 159-160; Cobb, 2001: 117). In Birch and Cobb's view, chickens belong to the category of animals that can legitimately be killed for food. Porpoises and chimpanzees, on the other hand, would belong to the other category, since 'there are indications of an individuality resembling our own and of social relations which lead to grieving for the dead' (Birch and Cobb, 1984: 160). Birch and Cobb claim that the 'element of uniqueness' would be 'trivial … in the chicken's case', that it would not be 'pervasively affected by the anticipation of its death', that it might suffer as much when it dies from old age than when it undergoes a 'violent death earlier in life', and that the death of one chicken may not cause 'grief' for other chickens (Birch and Cobb, 1984: 159).

Therefore, provided chickens are killed without being made to suffer too much, and replaced by other chickens, no value would be lost.

This proposal is problematic for a number of reasons. A first problem is the claim that chickens are not unique, which lacks support. A second problem relates to the notion of possessing 'an individuality resembling our own'. The question could be asked why this should matter morally? Elsewhere, Cobb has clarified that this is not 'the only basis of valuing other species', providing the example of dolphins who might be less similar than monkeys, yet who may have no less moral significance (Cobb, 2001: 117). A third problem is the suggestion that porpoises and chimpanzees might, unlike chickens, be capable of anticipating their own deaths and grieving about the deaths of others. This has been contested by Warwick Fox, who refers to a substantial body of empirical evidence to support his claim that non-human animals do not have an autobiographical sense of self or a life-plan, and that therefore only humans are able to anticipate death and grieve about the death of others (Fox, 2006: 207-245). If Fox is right, Birch and Cobb also fail to distinguish chickens from chimpanzees and porpoises on this basis. This takes us to a fourth problem. Since many humans clearly are affected by the thought that they might suffer a violent death against their wishes, the question must be asked if this implies we should support the implication that only humans should not be killed (when this is not in their best interests) and replaced by other humans. Not even this seems to be safeguarded if we follow Birch and Cobb's proposal. In view of the fact that many humans, for example young people, are not able to anticipate their own deaths, their proposal seems to imply that they could legitimately be killed and replaced. Birch and Cobb might reply that the fact that other people might grieve over the deaths of others should be taken into account. The problem with this reply is that it fails to distinguish between human and nonhuman animals. Pet lovers, for example, might grieve over the deaths of their pets. Birch and Cobb might be willing to accommodate for this in their theory, by allowing pets to be included in the category of animals that should not be killed when it does not serve their best interests. Yet nothing in Birch and Cobb's theory suggests the killing of a pet would be wrong once it no longer benefits from the care provided by its owner (for example, when its owner dies).[5] Likewise, there would be nothing wrong about killing a human infant provided its death is not grieved over by anyone. In the latter case, the need to replace the life that was lost would not even enter into the equation, at least in view of Cobb's claim that 'the overall excess of human population should be a factor in shaping public policy toward abortion and the right to die' (Cobb, 2004: 19-20). The fifth problem is that this view of the value of human life is far too restrictive. I have argued elsewhere that the notion of relative degrees of richness of experience is helpful to resolve value conflicts between nonhuman organisms, yet that it must not be used to rank different human beings relative to one another (Deckers,

[5] Elsewhere, Birch casts doubt over this claim. See Birch, 1990: 65-66.

2004). This need not necessarily imply that it is always wrong to kill a human being. Different circumstances may require different treatment, yet equal respect. This approach is based on the recognition that the question of whether or not one is a member of the human species matters morally. I believe that humans are predisposed to give preferential treatment to humans because we value the fact that all humans are necessarily born from humans, not because humans might or might not display a set of contingent characteristics. We are in good company here. Many social animals put the interests of their species members above the interests of members of other species. The sixth problem with Birch and Cobb's proposal relates to what Daniel Dombrowski has called the 'replaceability argument' or the view that animals can legitimately be killed and replaced by animals with similar capacities for richness of experience. Since process philosophers assume that the future is not only unknown, but also open, there is something wrong with the idea that the experiences of animals that live in the present are valuable only insofar as they outweigh the experiences of any animals that might live in the future. Dombrowski has remarked that Birch and Cobb may have adopted a particular view of omniscience (contested in other contexts by process philosophers) from their Christian tradition, whereby the future is regarded as already known, to justify the killing and replacing of animals. Dombrowski's view is that, since the future is still open, it would be wrong to make the assumption that the experiences of many animals that live now can be outweighed by the experiences of those animals that might live in the future (Dombrowski, 2001: 34). A similar argument could be used to cast doubt over Birch and Cobb's suggestion that killing animals swiftly well before they reach old age may be better than allowing them to die a natural death. In spite of our lack of knowledge about what might happen in the future, the question could still be asked if killing animals might be better compared with allowing them to die naturally, given the likelihood that many animals will die natural deaths that are far from pleasurable. I think a distinction should be made between situations where the killing might be in the best interests of the animal, and situations where this might not be the case. In my view, killing can only be justified where it might be in the best interests of the animal concerned, provided humans can meet their dietary requirements by other means without too much difficulty. This presupposes that the continuation of life is normally in an animal's best interests, and that this should normally be given more weight than the continuation of a plant's life. As I mentioned before, the view that nonhuman animals have an interest in the continuation of life has been contested by Fox, who has argued that nonhuman animals lack the concept of an enduring self which would be a necessary condition for an animal to have an interest in life. While I agree with Fox that nonhuman animals may lack the concept of an enduring self, I believe such a concept is not required to decide to give nonhuman animals more moral significance compared to plants. The fact that nonhuman animals can be observed to show concern for their survival by their actions and appear to be affected more by the presence or lack of suitable survival conditions supports the view that, instrumental considerations being

equal, killing nonhuman animals when this is not in their best interests is more morally problematic compared to the killing of plants.

This position appears to be supported by McDaniel, who writes that 'Christians in industrial societies whose lives do not depend on the eating of meat can and should choose vegetarianism' (at least if McDaniel regards this to be a moral duty also for those who are not Christians) (McDaniel, 1989: 71). However, since McDaniel proceeds by relating his 'boycott' of the 'meat industry' to 'the appalling conditions under which most animals are raised for food and transported to slaughter', the question must be asked if McDaniel would support such a boycott if these 'conditions' were better than they in fact are (McDaniel, 1989: 71). Presumably, his answer would be positive as long as human 'lives do not depend on' it. McDaniel clearly shows a concern which extends beyond the question if animals have been spared from unnecessary pain: 'in slaughtering certain animals we violate their interests in surviving with some degree of satisfaction' (McDaniel, 1989: 22). This is also supported by Dombrowski, at least for animals who have 'memories' and a 'desire to continue living' (Dombrowski, 2001: 31-32). Dombrowski questions if 'sneaking up' on an animal in order to kill it painlessly (if such were possible) could be used to justify including animals into one's diet, and resists this conclusion by appealing to what Narveson has called the argument from marginal cases (Dombrowski, 2006; Dombrowski, forthcoming; Narveson, 1977).[6] This argument can be summed up as follows: those who support speciesism are faced with the task of finding a morally relevant trait that sets all humans apart from nonhuman species. Since no morally relevant characteristic can be found that all, and only humans possess, any characteristic that is chosen to exclude nonhuman animals will also exclude 'marginal cases' of humans, for example the mentally handicapped, infants, or people suffering from dementia. Since Dombrowski objects to excluding these humans, he argues we should not exclude nonhuman animals with similar characteristics either, at least if we value consistency and share his view that these humans should not be excluded. On this basis, the only way in which we could be consistent in showing respect for these marginal cases of humans (so that we do not kill them to provide food, for example) is by showing the same measure of respect for those nonhuman animals who possess similar characteristics. By this standard, many nonhuman animals would be protected, rather than be killed to be eaten. One problem with this account is that the moral validity of speciesism need not hinge on finding a characteristic that all humans, and only humans, possess, as I have argued above. Dombrowski grants that partiality towards humans might be 'legitimate in morality', yet he is inconsistent by writing that the 'ascription of basic rights' should be 'impartial'

[6] Incidentally, Dombrowski has noted that the argument from marginal cases has been criticised for using the label 'marginal' to describe certain people. I agree with this criticism. Dombrowski has suggested replacing the notion by 'the argument from species overlap'. See Dombrowski, 2006: 232.

(Dombrowksi, 2006: 230). A second problem with Dombrowski's position is that it is too restrictive. Dombrowski has argued that 'animals … have memories of the past and expectations or hopes … regarding the future (and) … as Regan has famously put … lives of their own' (Dombrowksi, 2006: 229). This statement raises several questions. First of all, Dombrowski's reference to Regan suggests support for the attribution of a right to life to a rather limited range of animals, perhaps informed by Regan's rather narrow notion of what it means to be a 'subject-of-a-life', which applies to a rather limited class of animals.[7] Secondly, in the light of Fox's views (described earlier), it must be doubted if any nonhuman animal could reasonably be held to have memories or hopes for the future, at least if we refer to the ways in which we have memories and hopes. If what Dombrowski refers to is the ability to conceptualise and reflect on moments of its past, or the ability to plan the future, only humans may have this reflective ability. Thirdly, if the previous point is valid, the argument could still be made that more animals than those recognised by Dombrowski might, without being aware that they do, act in accordance with what has been learnt from the past and anticipate the future. The New Scientist recently reported on research carried out by Li and Cox at Princeton University which supports the view that even amoebas (*Dictyostelium*) may have memories, understood in this more limited sense.[8] Dombrowski doubts if the category of animals with a right to life can be extended to include those who lack a central nervous system, providing the example of 'clams' who may not have this right (Dombrowksi, 2006: 225). Yet since clams respond to external stimuli in ways that cannot be observed in plants, e.g. by contracting swiftly and changing location upon being touched, my view is that their lives matter more to them. While this does not imply that I support Dombrowski's position that plants lack 'lives that can go well or ill *for them*', if the view that clams have more integrated selves (including, perhaps, memories and relatively sophisticated capacities to anticipate the future) is correct, this matters morally (Dombrowksi, 2006: 226). We should abstain from eating animals, however simple, where sufficient plant nutrients can be obtained without great difficulty. I come to this conclusion also on the basis of negative feelings I have accumulated over many years in association with the killing of animals. I feel strengthened in drawing moral lessons from these feelings by recognising that others have had experiences that are remarkably similar.

Towards the end of his book, McDaniel refers to an experience he had when he was ten years old, when he went hunting with his father and felt he had to prove that he was 'a man' by shooting a white-tailed buck 'without being sentimental about it' (McDaniel, 1989: 111). After it had been shot in the back, McDaniel cried whilst walking over to the buck to shoot it again, 'despite the self-imposed

[7] See Regan, 1983.

[8] See Huang, 2007.

pressure not to show any emotion'(McDaniel, 1989: 111). Similarly, when I was a teenager, I was told by a fellow pigeon fancier that I was not a man if I could not bring myself to kill pigeons. Like McDaniel, I became a man by developing the ability to kill pigeons, yet my negative feelings about doing so never left me. Like McDaniel, I now much prefer not to be a man if this is what it means to be one. I agree with him, though, that the hunting or killing of nonhuman animals should not be banned altogether, provided adequate nutrition cannot be obtained in any other way that is practically feasible. What these personal accounts have in common is two things: one, that killing the animals involved was not a pleasant experience, and two, that these experiences prompted reflection about the appropriateness of doing so. The question must be asked if these personal, emotional experiences should be taken seriously in a debate on vegetarianism. Dombrowski seems to agree that they should by showing his appreciation for what Whitehead described as the virtue to connect abstract ideas with concrete emotions (resisting what he called the fallacy of misplaced concreteness). Like McDaniel and myself, Dombrowski was stimulated to reflect on the process of transformation from living animal into dead meat by an uncomfortable personal experience. His perception that what happens in a slaughterhouse is 'a gruesome affair' is generalised in the belief that 'morally reflective people (including meat-eaters!) cringe when they imagine cows being cut down in the abatoir' (Dombrowksi, 2006: 229). This brings him to conclude that 'the meat-eater … is in a state of disequilibrium between *emotional* response and *rational* justification' (Dombrowski, forthcoming). The same must be said, though, about vegetarians who eat animal products such as dairy products. Given the fact that the production of these products still involves the killing of unwanted animals when it is not in their best interests (e.g. male chicks and male calves, as well as cows and hens that are no longer productive), many vegetarians may live in denial of how their food choices affect other animals. Since I believe that animals should neither be exploited nor killed unnecessarily, vegan lifestyles must be adopted by those who can meet their dietary requirements without much difficulty in other ways, unless animal products could be produced without the need to kill or exploit animals.

Having said that, the issue of whether or not we eat animal products need not hinge solely on the question if it is right to kill animals with the intention to eat them. Many vegetarians and vegans would not be happy to eat animals that had been killed accidentally either. Some might say that this is wasteful. Others might say that this is not much different from deciding not to eat humans after they die from accidents or natural causes.

Conclusion

While both classical materialism and dualism have encouraged the development of a strong anthropocentric ethic and contributed to unjustifiable forms of animal exploitation, I have sketched how Whiteheadian process thought can help us to

see the nonhuman world as a community of subjects, and contribute to the development of an animal ethic which overcomes the predominant ethic of strong anthropocentrism. The issue of vegetarianism was discussed as a paradigm case to reflect on the wider question if human care for nonhuman animals should encompass a concern with the infliction of suffering on nonhuman animals, or include a concern with the killing of nonhuman animals also. It was concluded that both concerns are valid. This resulted in the recognition of a moral duty to choose a vegan diet for humans who can satisfy their dietary requirements without great difficulty by other means, where the adoption of other diets would involve the unjustifiable killing of animals. Doris Schröder and Miltos Ladikas have defined global ethics as 'the attempt to agree on fundamental conditions for human flourishing and to secure them for all' (Schröder and Ladikas, 2005: 404). While this is a laudable project, for ethics to be truly global, the scope of global ethics must include a concern with safeguarding the conditions for nonhuman forms of flourishing also. The definition put forward by Schröder and Ladikas need not exclude such a concern as the argument could be made that human flourishing, understood adequately, is impossible without such a concern. I hope that this paper has contributed to answering the question of where this concern should be directed to.

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Global Bioethics and Human Ecology

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Abstract

This paper analyses the relationship between human ecology and global ethics using the worldwide environmental problems as climate changes, ozone depletion and biodiversity loss as case studies. The integrated human ecological approach allows to deal with the biophysical and the socio-economic aspects of these global problems.

Climate changes are a typical example of a problem that is caused and of which the effects appear worldwide. Acting on this complex set of problems necessitates a worldwide ethics that entails (but is not limited to) the following elements: intergenerational solidarity, fundamental changes in attitude underpinning the human way of life, deliberate rejection of the lobbying practices of target groups with non-environmental agenda's, adopting a worldwide consensus on effective reductions of greenhouse gas emissions and management of the disasters that harm in particular developing countries.

The participation in the Convention of Biological Diversity is nearly global, which illustrates the awareness on the issue of biodiversity loss. Nevertheless,

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biodiversity loss is still accelerating. As the current international policy is not enough; a global mentality switch is necessary.

Since 1987, the Montreal protocol is the legal framework designed to halt to emissions of ozone depletion substances and has been ratified by 191 nations. Currently, there is a decrease in chlorine concentrations in the stratosphere but there is no increase detected yet in stratospheric ozone concentrations. We should realize that recovery of the ozone layer might last for some generations. The protocol cannot prove its effectiveness is such a limited time span.

The paper points to two fundamental characteristics of a global ethics on environmental problems:

- the worldwide geographical scale: solving global environment, problems will depend on our ability and capacity to operate as one world community.

- the long-term time scale that is associated with a long latency period, resilience of the environmental systems and scientific uncertainties: to deal with these aspects a pro-active attitude to global environmental problems is mandatory.

In realizing these, scientists have specific ethical responsibilities. They should focus on the long-term effects and they should adopt an ethical conduct that avoids environmental damage as a result of the application of scientific knowledge.

Keywords: *global environmental problems, climate change, biodiversity loss, ozone depletion, and ethical consideration*

1. Introduction

Human ecology is the study of the complex reciprocal relationships between humans and their environment. Environment here needs to be understood in its widest context: it entails not only the biophysical components (water, air, soil, pollution, resources), but also the socio-cultural environment (that relates to politics, sociology, economy and psychology). For the human ecologist, environment refers both to the internal (molecules, cells, tissues, organs) but also to the environment that is external to the human body (indoor quality, ecosystems, biomes).

Environment not only refers to virtually undisturbed nature assets, but even more, to those ecosystems where humans are a dominating part off (forestry, agriculture, coastal zones, cities). (Borden *et al*., 1998). This vision on humans and their environment integrates global bioethics e.g. when it comes to worldwide environmental problems.

During the past decades growing attention was paid to worldwide impacts of humans on their bio-physical environment: the halons and freons induced depletion of the ozone layer, climate changes, biodiversity loss and desertification are examples that show that our present way of life and our interaction with the environment might have a practically irreversible effect on the future global development (Ernst, 2007). The effects of these impacts are cascaded in nature. The rise of the concentration of CO_2 and the other greenhouse gasses cause climate changes. Alternations in temperature, precipitation and humidity influence ecosystems and the distribution of protists, plants and animals. Some of these are pathogens and, consequently, also the incidence and geographical distribution of tropical diseases will change in different regions worldwide. Ecosystem changes also imply changes in agriculture, in income of families, regions and countries. There is no doubt these economical changes will lead to social (e.g. migration) and political impacts (IPPC, 2007). Therefore, understanding climate and other global changes necessitates a transdisciplinary, human ecological analysis of which ethics is an integral an integrated part.

2. Global environmental issues

The nature of global environmental problems ranges from local to global. From a biophysical point of view, global problems are caused worldwide and the effects are felt worldwide. Emissions of CO_2 and other greenhouse gasses (e.g. CH_4, N_2O) exist whenever human activity is going on, although different countries contribute in different way to the emissions. An average citizen of the US consumes twice as much energy as an average European or Japanese, who in their turn consume twenty times more energy than an average Kenyan.

Also effects of global environmental problems are felt worldwide, although on a different scale in different geographical regions. When both the intensity and number of extreme weather events will increase as a result of the climate change, areas that are already prone to hurricanes, cyclones and inundation are the first to suffer more.

As a rule, global environmental problems have socio-economic root causes. No doubt that biodiversity loss is related to biological causes as habitat loss, the introduction of alien species and pollution. However on their turn, these proximate causes are driven by socio-economic factors and demographic changes, policies, etc. Globalisation of trade and economy are often closely related to the socio-economic root causes of environmental problems (Hens and Boon, 2003).

Defined in this way, a wide array of global environmental problems exist. In this paper we address climate changes, biodiversity loss and ozone layer depletion as

examples to show that adressing global environmental problems necessitate a global environmental ethics.

2.1. Climate changes

Since the publication of the fourth report of the United Nations Intergovernmental Panel on Climate Change (IPCC, 2007) the short summary of the situation is: it is "very " likely that global warming is the result of human activity. Average temperatures could increase by 6-4° C by the end of the century if emissions continue to rise. With a rise of 4°C most likely. Such a situation will result in a loss of 10 % of food production worldwide; a 59 cm rise up of the sea level, that will hit many coastal regions worldwide, and the coast of Bangladesh and Vietnam worst; half of the artic tundra is at risk by the temperature rise ; while Europe will loose 80 % of its glaciers; 80 million people more will be exposed to malaria mosquitoes and 2,5 billion more to dengue fever risk. An estimated 20% to 50% of the land species are threatened with extinction. For the first time the IPPC warns that the increase of hurricanes in recent years is a consequence of climate changes. Although these effects will impact countries worldwide, they will be worse in developing countries, not only because their bio-geographical characteristics but mainly because of their technological, financial and cognitive constraints they face.

From a practical point of view, the ethical discussion focuses on when and how to act. The timing question is closely related to the almost more widely spread conviction that we should not pass the effects and the associated bills to the next generations. In particular after the publication of the 2007 IPCC report there are no more excuses not to act and the time to do it is now. From a global point of view, dealing with climate changes is about humanity's ability and capacity to manage the consequences of its own actions. So far, this has failed; however one cannot afford to do so any longer. The "how" question is more complex to address. From an ethical point of view, it comes to adopt responsibility to change our life styles and to adopt them to the changing environmental needs. When it comes to climate changes, this has local, national and international aspects. At the individual level it necessitates more rational ways to deal with energy and materials. Just one example to show that the consumer preferences overwhelm efficiency: the new Nintendo Wii games console uses in standby facility 10W of power, 10 times the power usage for standby function recommended by the EU. Left on for 22 hours a day, the emission related to its energy consumption are equivalent to the annual emissions per capita of people living in Afghanistan or Burundi (Simms, 2007).

At the national level new energy policies should be installed. They should turn towards renewable energies and learn from the nuclear debacles from the past. As we are late to react they should not only be targeted anymore to limit the greenhouse gas emissions, but also to mitigate the effects of the extreme weather

conditions and disasters that are induced or aggravated by the climate changes. At the international level, it is imperative to call for a new multilateral regime that goes beyond the Kyoto protocol and the capacity to monitor these new agreements.

In this context specific attention should be paid to developing countries and the environment poverty links. A positive attitude towards a new multilateral regime should also set aside the current well document lobbying of the carbon club that spun a formidable web of confusion at best, lies at worse. At the positive side these in depth changes in attitude necessitate a worldwide ethic to move the attitudes of the involved stakeholders in the same direction of environmental quality, sustainable economics and equitable social relationships. This is what Gore (2006) calls a "generational mission" and "an opportunity to rise". He points out that climate changes are not ultimately about any scientific discussion or political dialogue. It is about who we are as human being? It is about our capacity to transcend our limitations, to rise to this new occasion. To see with our hearts, as well as with our heads, the response that is now called for. This is a moral and ethical challenge.

2.3. Biodiversity loss

Assessing in detail the treat of the climate and other global changes to biodiversity is hard at present. Nevertheless the changing pattern in biodiversity can be summarized in the following way: species react in different ways on climate changes, some stay; others search for more suitable environments or, in the worst case, extinct. In most species the effects are still hidden, by the long life cycles of most species. The clearest examples of shifting species are now detected among lichen. Those tiny symbiotic organisms of algae and moulds are indicators for major environmental problems: acidification and over fertilisation. Most of the lichen (not all) are sensitive to global changes and demonstrate, more than other species, the effects of climate changes on biodiversity. They spread very efficiently (spreading themselves trough the air) and develop new populations wherever there is a suitable environment. Doing so, the percentage of southern species in the Netherlands increased between 1989 and 2001 from 22 to 40%. The typical northern species kinds of lichen are suffering of the temperature rise, and their habitat is shifting towards the north, thus leaving the Netherlands (Van Herk, 2006).

Climate change is however not the only treat causing biodiversity loss. New and disappearing species are a natural process. The problem is that currently we lose species at rates that are at least 100 times higher than the natural extinction rates. The causes of the actual spectacular loss in biodiversity is to linked to social developments. Nature and the natural environment are exposed to demographic changes, industrial development andfactory farming, intensifying transport, energy and water infrastructure and causing great stress. The impact of man on

nature causes different environmental problems, all negatively influencing biodiversity e.g. fragmentation, drying, soil acidifiction, over fertilisation, or degradation of habitats by recreation, traffic and agriculture (Gysels, 1999).

The Convention on Biological Diversity has three main objectives: the conservation of biodiversity, the sustainable use of its components and the fair share of the benefits arising from the use of genetic resources. The Global Biodiversity Outlook (GBO) is a periodic report on biological diversity prepared by the conference of the parties, the governing body of the Convention on Biological Diversity (setup in 1992). The most recent report (GBO, 2006) shows that ecosystems across the planet have been impacted by biodiversity loss. Out of the 24 ecosystem services recently assessed by the Millennium Ecosystem Assessment –a scientific undertaking involving 1300 experts working in 95 countries- 15 are in decline (UNEP, 2006).

Deforestation continues at an alarmingly high rate. Since 2000, 6 million hectares of primary forest have been lost annually. Marine and coastal ecosystems have suffered due to human activities. In the Caribbean, average hard coral cover declined from 50% to 10% in the last three decades. 35% of the mangroves have been lost in the last two decades. While protected areas cover some 13% of the world's land area, these are unevenly distributed, with only 2/5 of the world's ecoregions reaching the 10% benchmark. Only half a percent of the marine areas are covered (UNEP, 2006).

The average abundance of species is declining – 40% loss between 1970 and 2000. Species present in rivers, lakes and marshlands have declined by 50%. Declines are evident in amphibians, African mammals, birds in agricultural lands, corals and commonly harvested fish species. Habitats, such as forests and river systems are becoming fragmented, affecting their ability to maintain biodiversity and deliver ecosystem services. The intensification of fishing has led to a decline of large fish. In the North Atlantic, their numbers have declined by 66% in the last 50 years. The consequences of biodiversity loss and ecosystem disruption are often harshest for the rural poor, who depend most immediately upon local economic services for their livelihoods and who are often the least able to access or afford substitutes when these become degraded. In fact, biodiversity loss poses a significant barrier to meeting the needs of the worlds poorest, as set out in the UN development goals (UNEP, 2006).

Poverty can also be a cause of biodiversity loss, as the demand on forests for the provision of wood as fuels is excessive high, as there are no 'environmental friendly' substitutions in their range.

This necessitates intragenerational solidarity, as the excessive consumption of the rich and the increasing population in the poorer countries, both contribute to

the problem. But the rich have more tools to provide alternatives for the current negative spiral.

The near universal participation rate in the Convention, (187 countries and the European Community are presently parties) is a sign that the global society is well aware of the need to work together. But still, the rate of biodiversity loss is accelerating. For this reason, the Conference adopted a strategic plan, in which parties committed themselves to a more effective and coherent implementation of the objectives of the Convention, to achieve, by 2010, a significant reduction of the current rate of biodiversity loss (GBO, 2006).

An analysis of the state of implementation (The Millennium Ecosystem Assessment) demonstrates that more action at national level is urgently needed. The mainstreaming of biodiversity outside the environment domain, as strictly understood in all sectoral policies and plans, can be moderated by awareness rising among all stakeholders.

One of the findings of the Millennium Ecosystem Assessment is that the costs of the biodiversity loss are rarely assessed, but evidence suggests that they are often greater than the benefits gained trough ecosystem changes (GBO, 2006). Our money driven society is desperately seeking to express natural values and biodiversity in financial means.

The underlying assumption is that, if the value of biodiversity is fully evident in price mechanisms, this will reduce degradation substantially. At least in theory, governments can compensate for this type of market failure by imposing taxes. But there are different problems. Calculating the prices of biodiversity loss is not easy. Different methods have been used but none of them can capture the full value of biodiversity. The fundamental reason for this is that biodiversity embodies an insurance value for the generations to come, which is never taken into account. Moreover, valuing biodiversity faces serious ethical problems (Hens and Boon, 2003). Besides questioning how to perform a cost benefit analysis, there is the question why we should do it. We should resist to the move to reduce certain values to their economic benefit. Imagine doing a cost-benefit analysis on democracy, or friendship (Des Jardins, 1997).

Furthermore, inherent to cost benefit analyses are their monocular and anthropocentric view. Biodiverse ecosystems are seen as providers of goods and services that humans need for their wellbeing. The implicit danger in it is that species, currently unknown but in the future possibly of major importance, disappear. These losses cannot be replaced by money. Nature is not our property, we should be aware of our responsibility towards future generations. Hans Jonas (1984) states that we need an ethical orientation that keeps nature holy, that turns away from the anthropocentrism and adapts a transitive relation. Commers (2007) describes this transitivity as an ethical relation when a

negotiator (political e.g.) not only takes into account the people directly involved, but also all persons who are possibly involved indirectly. They can be unborn, later affected by the consequences of our actions, or not (yet) emancipated and affected by our actions in their well being. This is the case for the grandchildren of our grandchildren, the future generation ad situations that are difficult to imagine to us. If we realise we are not the heirs of our ancestors, but the debtors of the future, we adapt another relation towards ourselves, the other people, the other living organisms and nature as a whole (Commers, 2007).

This implies a shift from shallow environmental ethics (anthropocentrism) towards an ecocentric viewpoint. The core idea of this viewpoint is the postulation that humanity is inseparable from nature. Neither individuals nor living organisms are important, but it is the totality of nature that has moral value. Environmental problems can only be solved by people, who are able to make judgements that go beyond narrowly conceived human concerns (Naess, 1989).

2.3. Ozone depletion

In 1973 the later Nobel price winners Rowland and Molina suggested that CFC's might have a destructive effect on the stratospheric ozone layer. This part of the atmosphere (10-50 km above the earth's surface) prevents the most harmful UV-light from passing through the atmosphere.

The depletion of the ozone layer is caused by a catalytic destruction of ozone by chlorine, bromine, hydroxyl and nitric oxide radicals. These radicals are naturally present in the stratosphere, but from the beginning of the seventies of last century an increase of these substances of anthropogenic origin occurred. The main source of the anthropogenic radicals is the photo dissociation of chlorofluorocarbon (CFC) compounds (freons) and bromofluorocarbon (halons). The freons and halons are emitted as stable molecules into the atmosphere and then transported to the stratosphere, where they fall in parts.

The Montreal Protocol (designed in 1989) is the basis of a series of worldwide agreements that allowed reducing significantly the emissions of the most potent ozone layer depletors. It marked an encouraging policy, because decision makers took action, rather on the basis of the theory that CFCs destroyed ozone, than on the conclusive evidence that ozone was actually being depleted by CFCs. However, the scientific evidence behind the theory was substantial and there was strong preliminary evidence pointing to ozone depletion by CFCs. Decision makers, based on an assessment of the problem, found the risks of non –acting unacceptable. But the decision-making process was complex. Also non-environmental factors motivated the decision. For example, industry needed regulation to spur its development of alternatives and the public responded to the problem with great concern. While the Montreal Protocol is not a perfect

document, it is nevertheless a landmark agreement. It is the first international agreement aimed at resolving a global environmental problem. It is not only important because it outlines measures agreed on by the international community to protect the ozone layer, but also because it shows that innovative approaches to major global environmental problems are possible (US EPA, 2007).

In 1998, the highest concentrations in effective equivalent atmospheric chlorine ever were measured. Since then, there is a slight but steady decrease noticed in the concentrations of these stratospheric chlorine and bromine. Signs of recovery of the ozone layer however will take longer data series. Further research is necessary to demonstrate and convince all stakeholders of the usefulness of the Montreal Protocol. In this issue, the precautionary principle was applied successfully in legislation. Although there was no consensus yet on the extent of the problem, policy makers adopted the associated no regret policy successfully. Sceptics were hiding behind the scientific uncertainties. Maybe some more UVB radiation wouldn't necessary kill people. Maybe the changes in the concentration of ozone were caused by solar activity. For the environmental diplomats however, there was a specific wrongdoer, atomic chlorine and bromine, introduced by humans in the atmosphere. A large number of alternatives existed to reduce the overall risk to human health and the environment. There was a smaller incubation period between the origin of the problem and the first signs of the effects. The discovery of the Antarctic "ozone hole" by Farman et al (1985), confronted policymakers with a problem of which the extent was much greater than earlier expected. Hopefully, the current IPCC report has the same impact on the climate change policy, even when public awareness is lagging behind the facts and lobbying by economic think tanks as e.g. CEI is stronger then ever.

Discussion

The relationships between the interdisciplinary human ecological approach to environmental problems and global ethics allows identifying some characteristics of the latter one.

The first is the scale aspect. The discussion is about global problems. Therefore stating that the scale is important is at the same time obvious and unique. Obvious because on the different global changes discussed in this paper, and even more on their integrated aspects, we need to find sustainable patterns of development for the entire worldwide society, paying special attention to harmonizing the relationships between humankind and nature. This is at the same time unique because we are not used to live as one family in a global village. Rather we tend to emphasise on what makes us different from each other: our DNA, our personality, our family, our history, our culture, our policies. Nevertheless, solving global problems is vital for the survival and the

sustainable development of mankind. This depends entirely on our ability and capacity to function as a global community. This awakening necessitates fundamentally global, facts-based ethical processes.

Second is the time aspect. Large scale, worldwide environmental problems are characterised by a long latency period. This means, that as a rule, it takes a long time before the theoretically expected effects show themselves and can be objectivised by empirical scientific research. Long latency periods are also characterized by difficulties to restore the original situation.

When it comes to climate changes, e.g. it seems unrealistic to restore the pre-industrial concentrations of greenhouse gasses in the atmosphere. Rather, some decision makers strive towards a stabilisation of the CO_2 emission values at a level, which is the double of the pre-1700 concentrations. They propose to combine this policy with the management of the effects (including disaster management). This is an environmental and ethically unlikely situation of which one should learn.

The delayed response and the long period of insufficient action to reduce greenhouse gas emissions is closely related to two types of considerations:

1) No definitive scientific proof of the effects (scientific uncertainity),

2) Too impacting effects on business as usual and economics.

Experts that externalised the environmental agenda mainly advocated arguments for both considerations. They were as a rule biased as the attitude prevailed that warned for the cost of measures taken in a context which didn't guarantee results, based on an empirical scientific evidence. However, when combining scientific and social responsibility, it is not only important to produce arguments on "what to do", but also on the consequences of non-action. Only a balanced view between both will allow a reasonable policy basis to deal with scientific uncertainty. Applying the basic rules of such proactive attitude necessitates an insight in the underlining mechanisms, facts and ethical options.

The third aspect relates to the differential responsibility of the stakeholders and the role of scientists on the global environmental ethics debate. Most politicians and industrial managers are very much engaged in solutions of short-term problems. Global environmental problems happen at scales and timeframes that refer to situations beyond their term. Academics, on the other hand have not only the ability to think ahead, but it is actually their most important task.

To meet these expectations it is necessary to redefine academic priorities and to complement the dominating A1 publication mania, with indications for long term thinking in association with scientific-social responsibility.

There is a second ethical responsibility for scientists. Different disciplines in science handle different frames of reference: for a medical doctor the wellness of the patient is of major importance and the economist will favour dominant economical thinking. This leads to different environmental expertise areas in which safeguarding environment and sustainable development is not often the central issue of concern. It leads to non-univocal scientific advises, to biased arguments in discussions to confusion among both experts and non-experts and to attitudes that cause damage to the environment.

In 1995, Sir Joseph Rotblaut a Nobel Laureate, argued in his acceptance speech that the time has come to formulate guidelines for ethical conduct of scientists, perhaps in the form of voluntary Hippocratic Oath. He argues scientist shouldn't pursue scientific truth, without considering the ethical implications of their research. He emphasises the social responsibility of scientists and suggests that holding an amoral attitude towards science is actually immoral as personal responsibility is tied to the likely consequences of one's action. Without moral imperatives to avoid environmental damage, and an ethical attitude that favours environmental quality, confusion and policy inertion will continue and global environmental phenomena will increase in extent and intensity.

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PART IV

BIOETHICS AND SOCIETAL QUESTIONS

- Genes of isolates: a New Source of Exploitation ?
- Some Thoughts on Fertility Transition and its Aspects.
- A Short History of Mortality and Death.
- Ethics, Communication, PR and Advertising Strategies For the Promotion of In Vitro Fertilized Children: A Case Study in the Context of Turkey
- Television Dream World: Woman Variety Shows and Dream to Be A Winner: Case Study of In Vitro Fertilized Children
- The Analysis of Using Crisis Communication Activities in Media and Bioethics Perspective Towards Avian Influenza (Bird Flu): a Content Analysis Over Turkish Press
- The Ethical Criticism of Public Relations Management Under the Influence of Globlization: Public Relations Roles
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- An Analysis of Breast Cancer over Avon Public Relations Campaign: "My Breast was Cancer, Not Me!"

Genes of Isolates: a New Source of Exploitation?

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Abstract

Following the biotechnological innovations of the recent years in the field of population genetics, Anthropology focuses on the reconstruction of human past through the study of human genome polymorphism. The gene pools of geographically or culturally isolated populations constitute a precious source of relevant information and become of core interest for the contemporary "gene hunters". However, the economic implications deriving from the race of biotechnological companies to acquire genetic data in order to develop new therapeutic tools create major ethical dilemmas, related to the possibility of uncontrolled exploitation of the genetic knowledge. The case of the newly launched Genographic Project, promising new gifts to scientific research, but apparently linked to various commercialization factors, is discussed.

Key words: *genes, isolates, human polymorphism, ethical dilemmas*

Introduction: A draft overview of the human polymorphism study

The existence of human polymorphism has been observed since the dawn of humankind. The obvious variability within and between human groups has played a crucial role to the function of primitive societies, as a main cause for the development of collective attitudes of "us" towards "the others", still present in our world.

In any civilization, the evolution of social structures through time was based on the foundation of common values, at political and/or ethical level, which, consciously or not, were influenced by the phenotypic variability. Stereotypes and hierarchical perceptions concerning the societal appreciation of "the different" have repeatedly led the humankind towards cruel attitudes, like slavery and eugenic movements.

The introduction of the concept of blood groups by Landsteiner in the beginning of the 20th century could be considered as the starting point of a scientific perspective in the study of human polymorphism. This invisible polymorphism suggested that a) there is a deeper differentiation among individuals than the directly observable one, b) that these non obvious differences are often irrelevant to the external human traits, since all blood groups are present to all races and c) that ideologies of "better" or "worse" blood groups are total nonsense, with the only exception of them becoming meaningful in cases of blood transfusion treatments.

Anthropologists soon understood that this biological information could be valuable in the study of human populations, offering new insights to the reconstruction of the human past, the tracing of ancient migrations, or the relation between biological traits and health prognosis.

When in the mid sixties the wide use of the electrophoresis technique in protein separation revealed an even deeper variability among individuals, several laboratories all over the (advanced western) world intensively engaged in the research on protein polymorphism. Soon, allozymic data for various populations were accumulated, with multiple applications in the field of Anthropology. Human polymorphism became a separate holistic scientific field in the cross-roads of Biology, Genetics, Anthropology and Medicine. Our knowledge on the biological structure of the human being and of the human populations was suddenly enriched, whereas, other disciplines like Archaeology or Epidemiology had to update their context and methodology.

The next revolutionary step regarding the laboratory techniques was the invention of the Polymerase Chain Reaction, (PCR), followed by several complementary analytical methods like blotting, sequencing, genotyping etc. These new experimental tools for handling DNA, the ultimate source of genetic

information, revealed an enormous amount of invisible but surely measurable human polymorphism, becoming available to thousands of scientists.

Since this data thesaurus of the hidden genome polymorphism dominated the scene, all the related scientific disciplines entered a new era. After the completion of the ambitious Human Genome Project in 2003, the size, the content and the potential of the human polymorphism studies have changed for ever. In parallel, a new condition emerges in this field: the wider the scientific progress being noted, the more numerous the ethical questions that arise.

Globalisation in science, directly dependent upon the globalization of economy, shapes a new landscape where research institutes, biotechnological and pharmaceutical industries, governments, stock markets, political structures, educational, legislative and religious authorities, ethical bodies and consumers' institutions, bioinformatics centers and final beneficiaries of biotechnological innovations are interlinked in a complex system, which motivates the progress of our hi-tech civilization.

Within this framework, the data of human polymorphism are not just a source through which to enrich our knowledge about the human past and present. They carry an important economic value, constituting the basis for the development of new pharmaceutical products and individualized therapy methods. They are the background for extended forensic applications as well, thus setting additional dilemmas related to human rights.

Why "Genes of Isolates"? - The Icelanders' Genome

Geographically or culturally isolated populations were always in the focus of Anthropologists, who tried to study and interpret various societies of distant aboriginal people during the colonization era. The recent involvement of genetics in Anthropology created a shift of the researchers' interest towards genetic information at individual and/or population level. Indigenous people trace their ancestors back to the same land over considerable time. Their DNA contains key genetic markers that have remained relatively unaltered over hundreds of generations. Unique genetic mutations, for instance, may become fixed in a population through time, carrying information useful for the reconstruction of the past. Thus, the genetic information of isolates integrates reliable indicators of ancient migratory patterns.

However, genetic data of isolate populations are of special value mainly because of their medical and pharmaceutical applications, related to predisposition to several genetic diseases, or even for forensic applications.

In general, the combined function of various evolutionary forces over isolate populations, create distinct gene pools carrying unique genetic information of

particular interest for the "gene hunters", especially when followed by genealogical information. Such data could facilitate the correlation of genetic profiles to health abnormalities and accelerate the design of new pharmaceutical products.

Consequently, the profiting parts of this international game, namely biotechnological and pharmaceutical industries, project in priority the enormous health benefits deriving from the collection of data on human polymorphism. However, they usually hide the cruel economic war related to the data acquisition and the gene patenting procedure. A war, leaving as collateral victims the exploited populations, the moral values and the democratic function of our societies.

The case of Iceland, the most well known case of genetic data collection in Europe, reveals the various economic implications:

What make the Icelandic genome ideal for study, is the relatively small population size (about 275 000 people), the detailed individual medical records maintained by the public health services since 1915, the extended genealogical data available, as well as the minimum gene flow from external populations.[1]

Economical aspects behind the genomes of isolates: the deCODE case

In December of 1998, after much heated debate, the parliament of Iceland passed a bill concerning the creation of a centralized database of all the Icelandic peoples' genealogical, genetic and personal medical information. The parliament then granted an exclusive contract to deCODE Genetics, a biomedical company, to which access to the national health records was given.

About a year prior to the bill, deCODE signed a special agreement with Hoffman-LaRoche, a Swiss pharmaceutical giant, in anticipation of the contract. Genes associated with over 30 diseases, were of core interest for decode. The research costs for twelve of these cases, among them heart attacks, emphysema, and Alzheimer disease, would be financed by Hoffman-LaRoche. DeCODE began working with the voluntarily donated DNA of small groups of Icelanders. Later, the company launched a media campaign to attract DNA donors on a larger scale.

[1] Since the establishment of a few hundred Vikings and some Celts almost 1200 years ago, little migration from other places took place (e.g. women from Scotland and Ireland) due to the geographical isolation of the country. Moreover, a series of disasters such as plague and famine, have minimized the opportunity for new genetic input into the country's gene pool.

In January 2000, deCODE announced that it had almost completed "The Book of Icelanders," an extensive genealogical database of all Icelandic citizens, past and present, and was planning to publish it on the internet.

With so much personal information available to a private enterprise, scientists and policy makers maintain their reservations and watch the endeavour closely to see how the ethical, legal, and business aspects are resolved.

The opposition to the Icelandic government's Act has been organised mainly the by the Association of Icelanders for Ethics in Science and Medicine (Mannvernd).
Several objection arguments are listed bellow, as a representative collection of bioethical comments, which covers all cases of questionable genetic research:

- The database could violate personal privacy, easing access to health information that may be abused. An individual's information is encrypted, deCODE maintains, but codes can be broken. Most experts who reviewed the project's privacy measures consider the information in the database personally identifiable.

- The plan presumes the consent of all Icelanders. A person may opt out of the database at any time but any data that has already been entered about this individual will not be removed. This person then becomes the subject of research without consent. In addition, the law does not require that Icelanders be told what kind of research will be done with their personal data.

- There is a possibility that the results of the project may have adverse effects, such as medical stereotyping. For example, research into one of the diseases financed by Hoffman-LaRoche is schizophrenia, a mental disorder. If a significant percentage of the population were found to have schizophrenia, would health insurers jump to the conclusion that anyone with an Icelandic heritage anywhere in the world is predisposed to the disease?

- As sole licensee, deCODE has a monopoly on the data. The database belongs to the national health system managed by the government but deCODE has the right to commercialize the data for 12 years. Legislation even assures deCODE that access to the data cannot be granted if it harms the financial interest of the company.

- deCODE plans to market its information for a fee to interested parties, including pharmaceutical and health insurance companies. For example, the arrangement with Hoffman-LaRoche for 12 diseases effectively blocks anyone else from studying these diseases in Iceland.

- Free medications for specific conditions have been promised to Icelanders. However, the gesture comes with a stipulation -- deCODE and its

business partners must first acknowledge that the medications were developed as a result of the database.

- The government has touted the national economic benefits to be gained from the partnership with private enterprise. Although deCODE pays the government an annual license fee, this fee covers only the costs of the database and administration.

- Both deCODE and the government have speculated that biotechnology jobs in Iceland will increase because of the project. They failed to add that in this internet-connected world, scientists could work with the data on a computer in any location. There has been no influx of scientific research or pharmaceutical facilities to Iceland since the project began. However, there are a few jobs available at deCODE.

The Genographic Project: Old Issues in a New Package

However, whereas the commercial intentions of deCODE were clear from the very beginning, this is not the case for the newly established Genographic Project, which claims that it aims to the restoration of the human history through genetic data, thus projecting a rather holistic anthropological approach than a biomedical one.

The Genographic Project was recently launched as the outcome of alliance between the National Geographic Society, the IBM and the Waitt Family Foundation. It aims to assemble the world's largest collection of DNA samples, in order to *"map how humankind populated the planet, reveal man's migratory history and better understand the connections and differences that make up the human race"*. The goal is to collect and genotype within 5 years at least 100,000 indigenous DNA samples from around the world.

Dr Spencer Wells, a geneticist-anthropologist, as he characterizes himself, leads this international mission, having traveled already to remote places like Uzbekistan and Kyrgyzstan, where he establishes personal connections with the local people. He explains to them his idea *"to preserve a genetic snapshot of humanity, like archeologist running a rescue-excavation"*, trying to gain their consent for sample collection.

Dr Wells got his Ph.D. at Harvard, where he worked on the genetics of *Drosophylla melanogaster* with Richard Lewontin, thus becoming interested in understanding the reasons for genetic variation. Later on, he joined the research

group of L. Cavalli Sforza in Stanford, where he was fascinated by the idea of studying humans instead of fruit flies. [2]

Aiming to attract volunteer donors from all over the world, the project advertises the possibility of anyone to purchase the Genographic Public Participation Kit, for 99.95$[3]. In this price the participant receives a buccal swab kit with instructions to take his own cheek swab sample and submit it for further DNA analysis, a confidential GPID number, as well as a series of informative material in printed and electronic form. [4]

The key features of the project, as described in the respective web page, are summarized as follows:

- the international collaboration of 10 research centres worldwide (Australia, Brazil, China, France, India, Lebanon, Russia, South Africa, the United Kingdom and the United States), led by a "dream team" of qualified geneticists, (as Dr Wells calls his colleagues).
- the scientific and social supervision through an international advisory board, responsible for the selection of indigenous populations for testing, as well as for assuring the adherence to strict sampling and research protocols,
- the protection of privacy since the personal data are stored anonymously,
- the dissemination of the relevant information to the wide public through National Geographic, which will regularly update the public and the scientific community on project findings, using its website and its many other media platforms worldwide,
- the creation of future perspectives through the foreseen long term *Genographic Legacy Project.*[5]

[2] *"So much of what we see in the DNA, in genetic variation, is due to population events,"* says Wells. *"Which is great, but I'm not interested in the population history of fruit flies. I am, however, very interested in the population history of humans."*

[3] The price is slightly higher today

[4] Obviously this is irrelevant to the collection of genes of isolates. However, it is a good publicity practice and an important supplementary funding source, which actually stands upon the excitation of the public fiction on its own genealogical history.

[5] Proceeds from the sale of the Genographic Public Participation Kits help to fund future field research and a legacy project, which will build on National Geographic's 117-year-long focus on world cultures. The legacy project will support education and cultural preservation projects among participating indigenous groups.

Direct reactions of Indigenous People

As it was expected the huge advertisement of the project has triggered reactions from several directions, ranging from skepticism and reservations up to resolutions against it, deriving mainly from indigenous cultural and/or political associations. The objection of the *Indigenous People Council on Biocolonialism* is a typical one;

"…The IPCB is calling on all Indigenous peoples, and our friends and colleagues to join in an international boycott of IBM, Gateway Computers (the source of the Waitt family fortune), and National Geographic until it's demand that this project be abandoned are met"…. "We are prepared to stop projects that treat us as scientific curiosities. We must act to protect our most vulnerable communities from this unwanted intrusion"… We resisted the HGDP, and we will defeat this proposal as well."

The Genographic Project: Novelty or "déjà vue"?

A deeper inside in the issue of archiving of human genetic data during the last decades, reveals that the ideas of Dr. Wells and his companions are not new. The memory of the Human Genome Diversity Project, (HGDP) is still fresh.

The HGDP was announced in 1991, after an idea of Cavalli-Sforza et al.[6], aiming to collect biological samples from different population groups throughout the world, with the main objective to build up a representative database of human genetic diversity. *(GenEthics News issue 10)*

It started with an article in *Genomics*, which formed the initial call for a Human Genome Diversity Project (HGDP). Soon, the Human Genome Organisation (HUGO), the leading organization of the Human Genome Project, appointed a special Committee for the HGDP.

In 1992, a workshop on Molecular Biology at Stanford Uuniversity (in July) and a second one on Anthropology at Penn State (in October) took place, funded by the National Institute of Health (NIH), the Department of Energy (DoE)[7] and the National Science Foudation (NSF) of USA.

[6] Actually, Luigi Luca Cavalli-Sforza is the mentor of Dr. Wells, who joined his team at Stanford in 1994. He is also key person in the scientific board of the Geographic Project. To that respect, it constitutes an updated version of the same old story, differing mainly because it is exclusively funded by private sources.

[7] Surprisingly, an apparently irrelevant body like the Department of Energy of the USA was also the main economic source of the HGP (Human Genome Project) and still funds its continuation with the G2L (Genomes to Life) project. The latter is a project of enormous global scale, aiming to offer energy solutions based on the knowledge of various organisms' genomes.

In February 1993, the NIH organized a workshop for the HGDP specialized on ethical issues and funding possibilities.

In May of the same year, various NGOs started the attacks against the project.

Despite this contraposition, the HGDP was officially launched in a special meeting in Sardinia (September 1993), whereas in November, the North American Regional Committee (NARC) was formatted.

In January of 1994 HUGO adopted the HGDP, but in November of 1995 UNESCO declined to endorse it.

In 1996 the National Science Foundation awarded some pilot HGDP actions, but not sampling, since several reservations of the international community were always present. Meanwhile NARC released a "Model Ethical Protocol", providing practical and ethical recommendations about how to manage similar situations.

Between 1997 and 2000, some activities of secondary importance had been completed, like the 1st Cold Spring Harbor Laboratory meeting on Human Evolution (1997), the NARC Committee report (1997), the sets up of SNP[8] Discovery Cell-Line Collection by NIH (1999), the 2nd (1999) and 3rd (2000) Cold Spring Harbor Laboratory meeting on Human Evolution, as well as the collaboration of HGDP and CEPU (Centre d'Etudes du Polymorphisme Humain) in order to create a World Cell-Line Collection to produce DNA for diversity research (2000).

Thus, *"until now the HGDP remains ….an unfunded ghost at the Human Genome Project's lavish banquet…",* as H.T. Greely notes in his article in NATURE REVIEWS /GENETICS (v.2, March 2001)

The hardly successful outcome of the HGDP could be attributed to several causes, including, among others:

a) The initial controversies between the key persons Allan Wilson and L. Cavalli-Sforza involved on the sampling strategy.[9]

b) the direct reactions from socio-cultural anthropologists, which, at any chance depreciate physical anthropology accusing it of racist research.

[8] Single Nucleotide Polymorphisms

[9] Wilson was in favour of a grid type collection, based on geographical coordinates, whereas Cavalli-Sforza insisted to a population traits based sampling, considering linguistic and other cultural data as criteria for populations' definition.

c) the ethical reservations related to the issues of privacy, data storage and future use, informed consent, human rights etc…, which remained even after the expressed support of the US National Bioethics Advisory Commission, and the elaboration of the Model Ethical Protocol by NARC.

d) Confused reactions from the press, both scientific and popular (*Science* was largely supportive*, Nature* consistently negative)

e) Strong opposition against the *"vampire project"* from activist organisations representing indigenous people, expressed through accusations for biopiracy, biocolonialism etc in the mass media. *" First you took our land, then our bodies and now our genes"…,* was their favorite motto referring to the possible uncontrolled exploitation of genetic knowledge by pharmaceutical and biotechnology companies.[10]

George Annas, Professor of Medical Ethics in MIT and member of the Committee on Human Genome diversity agrees;

"We're taking from them their DNA, which we now consider like gold. It is even worse than standard colonialism and exploitation because we are taking the one thing that we value. And after we take that we have no real interest in whether they live or die."

"It is virtually impossible to get the informed consent of indigenous people for this. Number one, I think, because if they understand the project they would refuse and, number two, if they don't understand they can't give consent. So it is total exploitation. It is taking things which can be of no benefit to them."

"We need to secure their future as peoples, not just immortalise their genes"

What is actually new in the Genographic Project?

The comparison of the Genographic Project against its ancestor HGDP, reveals some impressive innovations, showing the gradual adaptation of science to global market practices.

Here, behind the spectacular "scientific" presentation, an interesting enterprising alliance is hidden, promoted by a young, ambitious, dynamic, adventurous, and well educated "Genes' Indiana Jones". Dr Wells is talented in telling simplified scientific tales, using attractive expressions to charm the wide public

[10] In reality, the polymorphic markers selected for the HGDP were of minor interest in terms of medical applications, in contrast to those of the HGP. This is a reason why the HGDP actually failed to attract the support of the two major backers of HGP, i.e. NIH and DoE.

like: *"..the history of humankind is written in our blood…, blood is a time machine traveling us to our past… the pedigree of humanity going back up to 50000 years ago…etc. etc."* he says in the recent NGS widely disseminated documentary, where he keeps a protagonist role. He is indeed the most proper person to promote a first class scientific marketing, not hesitating to propagate the project with speculating arguments. In his lecture at the University of Athens last April, he spoke about the possibility to trace back the origins of Greek and of the Kalash community in Afghanistan to Alexander the Great!!!. Obviously such arbitrary assumptions may trigger the wide public and attract its attention to genetics, however they cannot withstand serious scientific critics. Having acquired his scientific training in eminent universities Dr Wells knows very well both the demands and the limits of the proposed research. Why does he use practices suitable to a glamorous show to advertise it? The idea that science needs advertisement is a modern one, hardly compatible to the academic philosophy.

The cooperation integrates the NATIONAL GEOGRAPHIC SOCIETY, the FAMILY TREE DNA Co. (a commercial company acting as subcontractor of National Geographic, in order to construct the pedigrees of those individuals who have purchased the DNA kit), the giant informatics company IBM, the Waitt Familly Foundation, a non profit character organization of the family which is related to the other partner, the Gateway Computers company. The latter belongs to the Waitt family and its recently known economic status is questionable.

Finally, by purchasing the public participation kit, any interested individual becomes a partner in the project, without being aware of the faith of his genetic information,[11]although some guarantees are given about the data protection. All the package of the aforementioned comments concerning the Iceland and the HGDP cases could also feet here.

Not surprisingly, the creative entrepreneurship spirit goes further. In June 2006 for instance, in the web site of the travel agency SMALL SHIP CRUISES (*http://smallshipcruises.com*), an adventurous tourist could find the following information:

"Lindblad Expeditions returns to the South Pacific this year with National Geographic Endeavour. Guests will travel to the Cook Islands, Tahiti, Fiji, Easter Island and Papua New Guinea. Geneticist Spencer Wells will share his work as director of National Geographic's Genographic Project to map the

[11] In the issue of December 2006, National Geographic advertises the DNA kit as a priceless Christmas present for family and friends. The advertisement calls anyone "to discover his family, which is much bigger that one could ever thought, since…deep inside anyone's DNA there are encrypted elements which could reveal the secrets of ones' own ancestors migration history and of the human origins!!!!

journey of humans as they populated the planet. Passengers on the July 24 and 30 cruises will participate by submitting cheek swab samples prior to traveling and learning about their individual migratory histories." [12]

DNA is in fashion! Genetic research becomes a profitable product for sale, addressed to a much broader target group.

Critics

Whereas the ethical questions linked to the Genographic Project (already mentioned in the case of HGDP as well) are somehow, even not satisfactorily, covered in the relevant web pages, the scientific aspects are rather underrepresented, and the possible economic interests of this "scientific business" are actually out of discussion.

John Hawks from the Department of Anthropology at the University of Wisconsin (www.johnhawks.net), highlights several invisible sides of the project:

One is the apparent lack of public funding source, which makes impossible the implementation of any public supervision of the projects' activities and results.

The Waitt Family Foundation sponsors the project with the amount of 40 million $, an amount sufficient enough to finance all the anthropological research for several years. It is hard to believe that in the USA competitive environment someone invests such an amount of money without expecting any profit.

At the moment the main beneficiary seems to be the National Geographic Society, which promotes itself by impelling projects that generate wide publicity like this one and involve the possibility of direct public participation.

The coalition with the Family Tree DNA co., supports the attraction of individuals' participation and directly competes the initiatives of other genealogical private companies like the similar DNA ancestry project, promoted by the homonymous company[13].

Referring to the protection of the data, the Project Team promises to the people who buy the kit and submit their sample:

[12] http://www.nationalgeographicexpeditions.com/498.html

[13] http://www.dnaancestryproject.com

"We will keep your cheek scraping sample only for the Genographic Project. Your sample will not be used for any other purpose without your written permission. The genetic tests we will perform are designed only to research early human origins and movements. The tests do not tell us anything about your health, or about any health problems you (or your family) may have. This is an anthropological study only. Unless you instruct us otherwise, your cells will be destroyed at the conclusion of the Project....During the project, you will have the opportunity to contact Family Tree DNA, the company licensed to perform testing for Genographic Project participants, to request follow up testing if you choose. Unless you do so before the conclusion of our project, your cells will be destroyed and will not be available for follow up testing".

…and informs that…

"With a simple and painless cheek swab you can sample your own DNA. You'll submit the sample through our secure, private, and completely anonymous system, then log on to the project Web site to track your personal results online.

This is not a genealogy test and you won't learn about your great grandparents. You will learn, however, of your deep ancestry, the ancient genetic journeys and physical travels of your distant relatives".

Given the economic extensions of genetic data acquisition, even without any intension to doubt the sincerity of such declarations, it is clear that only the public engagement of a private investigator does not guarantee sufficiently the possibilities of sample cloning for further research, or of data hacking and unforeseen use.

Moreover, such engagements do not cover the collective sampling from indigenous groups, who actually have no guarantees for the future use of their genetic information, whereas numerous samples have been already gathered through procedures actually out of control.

In reality informed consent from members of indigenous groups might never have been possible, since inform consent presupposes an educational background in genetics that few people possess, even in the western world. Thus the best consent a researcher could be given is the consent of the tribe leaders, who actually offer access to their people's genetic material, without being themselves able to judge the situation.

The contribution of IBM aside from bioinformatics, is not clear as well. IBM is supposed to create a secure, scaleable database that will store the data centrally, and will provide sophisticated online collaboration tools. Up to now, IBM has not employed scientists specialised in modelling natural selection or testing

migration hypotheses, since anthropological research of this kind was not important for the informatics business.

Open scientific questions

The main scientific issues, always arising in any debate on human polymorphism, are also present in the case of the Genographic Project. In such a complex debate there are no ready made, absolute, or commonly accepted answers. The publicly available information does not satisfy the demands of the anthropological community for a scientifically reliable, morally acceptable and historically appreciated research.

Such issues concern for instance:

1. The kind and the number of the genetic markers under study.

This choice depends upon the context and the specific goals of each project. The analysis of only Y chromosome and mtDNA haplotypes is not enough for the reconstruction of human history if we take under consideration: the complexity of evolutionary events through millennia, the increasing genetic admixture between populations, the high possibility of sub-populations' existence within a group, the discontinuities in gene pools due to natural disasters, epidemies and other bottleneck effects.

2. The number of the isolate populations, the total of their particular traits, as well as their effective population size, necessary to describe sufficiently the global human polymorphism.

3. The criteria of sample selection and preservation, i.e. how to create, maintain and periodically update uniform (or compatible) databases for worldwide networking use?

4. The statistic tools to be applied for the data analysis, given that the selection of a statistic package partly directs the results. Inferences about the mutation rates as molecular clocks include also some degree of uncertainty, being just mathematically developed hypotheses, dubiously related to the real past.

Finally, the scale of the project, in terms of sample size and financial prosperity, transfers the whole effort to the resume of multiethnic research enterprises and feeds the justified fears of anthropologists that soon only the big and wealthy research centres will exclusively perform this kind of basic research.

Conclusion:

In the contemporary scientific landscape, dominated by genetics and biotechnology, Anthropology has -justly- made a turn towards molecular and population genetics, promoting its collaboration with other disciplines and overcoming scientific barriers.

The preponderance of new technologies over classic laboratory techniques, permits the massive analysis of tremendous amounts of data, and drives science to this direction anyway.

However, the progressive involvement of pure geneticists lacking anthropological education, in combination to the inability in practice to prevent possible data misuse, pose core questions about the content, the methodology and the acceptable applications of anthropological research.

Unluckily, the economic dimensions of genetic knowledge pull the pioneer research towards a progressive privatization. Thus, science is compressed within the ratio of investments/profits, thus becoming rather a mean for accumulation of riches, instead of being a value *per se.* Basic research compromises in favor of the applied one, whereas the academic spirit stays back of the profitable collection of genetic data.

On the other side, the reactions of aboriginals' groups, NGOs and humanitarian associations, although justifiable, turn to an absolute denial, which, under the circumstances is an unrealistic utopia.

Furthermore, the debate on Bioethics does not offer definite answers. It is a chaotic and endless debate, since it is performed among groups of conflicting philosophies, backgrounds and/or interests. It delays in relation to the scientific innovations, thus being usually out of date. Similarly, the creation of updated legislative frameworks for genetic data control is in delay, since during the time needed for the elaboration and establishment of the proper laws the frontier of biotechnology has moved ahead.

In spite of its weaknesses, however, this debate is a unique buttress and source for the production of the legislative or social measures, necessary for our co-existence within the contemporary cultural framework.

The aforementioned confusion will be intensified as science and technology proceed rapidly whereas education and public understanding of science do not equally follow up.

Of course, the draft overview of the hidden negative aspects of the Genographic Project, does not support the idea that human polymorphism should be an untouchable research field.

In the contrary, a global assessment of the extent of human genetic variability has substantial scientific merit, largely because of the insight that the data collected could provide into the origin and evolution of the human species. A comprehensive survey of human genetic variability both between and within populations could map such variability, place it in social and environmental context, and transform scientific understanding of human evolution and the course of human prehistory. Moreover, it could contribute fundamentally to a new era of modern molecular medicine.

However, such an effort should be monitored under strict scientific spirit and social control. Marketing practices, as those applied in the Genographic Project, could not be accepted as academic behaviour.

The bioethics debate, despite its chaotic character worldwide, should be kept alive, followed by increasing effort for more precise information to the wide public. Of course, the latter requires intensive promotion of the public understanding of science, depending upon systematic policy from the educational, research and social structures, under the supervision of the relevant international organisations. Especially in the field of the study of humans, the holistic approach of Anthropologists could offer an important contribution. Therefore, their responsibility for a wider dissemination of their knowledge and a more intensive presence in the international developments is higher.

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Some Thoughts on Fertility Transition and its Aspects.

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Abstract

Classical fertility transition theory interprets the global fertility decline as the result of the modernisation of the societies, in which the traditional ones are transformed to modern ones. Several aspects of fertility transition were examined on the ground of the different scientific approaches of the phenomenon. It seems that despite that fertility transition is evident globally; the fertility transition theory quite often fails to interpret the causal local conditions of fertility decline because of its general character and the westernised view of human societies.

Keywords: *Fertility transition, Modernization, Westernisation, Developed Countries, Developing Countries*.

1. Introduction

The demographic forces of population change, i.e. fertility, mortality and migration, are of special interest not only as the determinants of the change itself but also as indicators of various transformations that are observed during the evolution of human societies.

Great differences are observed between historical and contemporary human populations, concerning mortality levels and their changes through time. These concern the starting point of the transition, its timetable and pace. According to Kirk (1996), mortality transition followed three major phases in the western world. Arbitrarily, the first phase corresponds to the period from the late 18^{th} century up to the first half of the 19^{th} century. The second one lasts up to the World War II, and the third one follows, even though several modifications have been proposed to this scheme.

In an analogous way with mortality, fertility levels exhibit great variability not only between different populations but also in the same populations between different times. The generally observed global trend concerns the decrease of fertility (Heuveline, 1999, Caldwell, 1999). The diachronic decrease of both fertility and mortality, i.e. the demographic transition, is a complex multivariate phenomenon that has been studied from different angles of view, the economic one, the sociological, the anthropological etc.

The classical theory of demographic transition was first formulated by Notestein (1945). As Greenhalgh (1995) notes, it is an extension of the modernization theory in order for the demographic phenomena to be interpreted. According to this theory, a pre-transitional society with high fertility and mortality, under the action of the basic forces of its transformation (modernization, urbanization, industrialization etc.), exhibits, firstly, a decrease in mortality levels which, afterwards, is followed by a decrease in fertility. The final result is the emergence of low birth and death rates (Wringley 1969; Coale, 1973; Teitelbaum 1984). Then, the basic thesis of the demographic transition theory is that the transformation of the pre-transitional society to the post-transitional one, resulting under the action of social and economic forces, is unidirectional and non-reversible. In that course, the traditional way of life is gradually abandoned in favour of the western model of social organization, which is generally considered to be more advantageous (Greenhalgh, 1995).

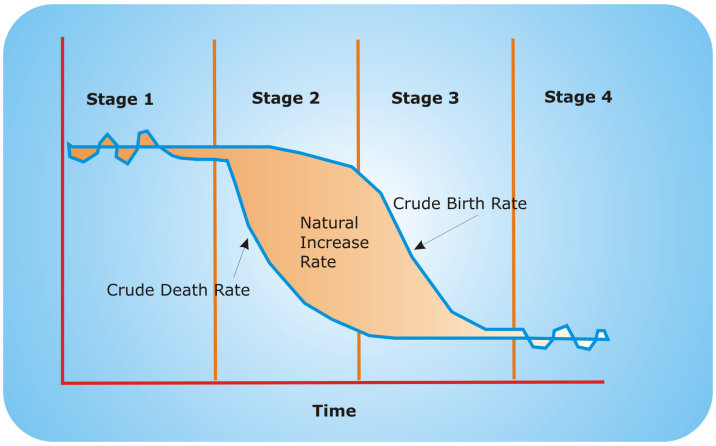

Figure 1: The classical stages of demographic transition. Adopted from Ashford et al. (2004)

The demographic transition, in its simplified form, can be understood as a series of episodes of changes of the natural increase rate of a population (Figure 1). In the fist stage, the pre-transitional one, the crude birth and death rates are high and the natural increase rate is very low. In the second stage, mortality declines in time while birth rates remain almost stable. Because of the observed mortality trends, natural increase rate increases. In the third stage, mortality levels are low and fertility starts to decline, then natural increase rate declines too. In the last stage, the post-transitional one, both crude birth and death rates are very low, as is happens with the natural increase rate, which approaches, more or less, its pre-transitional levels. Essentially, the demographic transition pattern, that has as yet been described, presupposes that mortality's decline foreruns fertility's decline, and in that way, the temporal trends of mortality and fertility are interconnected in a causal way. Nevertheless, it has been proposed that mortality decline does not all the time antedates fertility decline, as it was found in Western Europe's demographic transition where the opposite actually did happen (Cleland and Wilson, 1987). On the other hand, Kirk (1996) observes that in the very great majority of transitions, which were studied all over the world, mortality decrease antedates fertility decrease.

An open question still remains. Is the demographic transition theory globally applicable? Or is it only the way that western culture understands and interprets global phenomena? Finally, does the globalisation lead to the westernisation of the societies, and if so, does this hegemonic trend lead to the gradual abandonment of cultural and social practices in favour of the western lifestyle?

2. The fertility transition

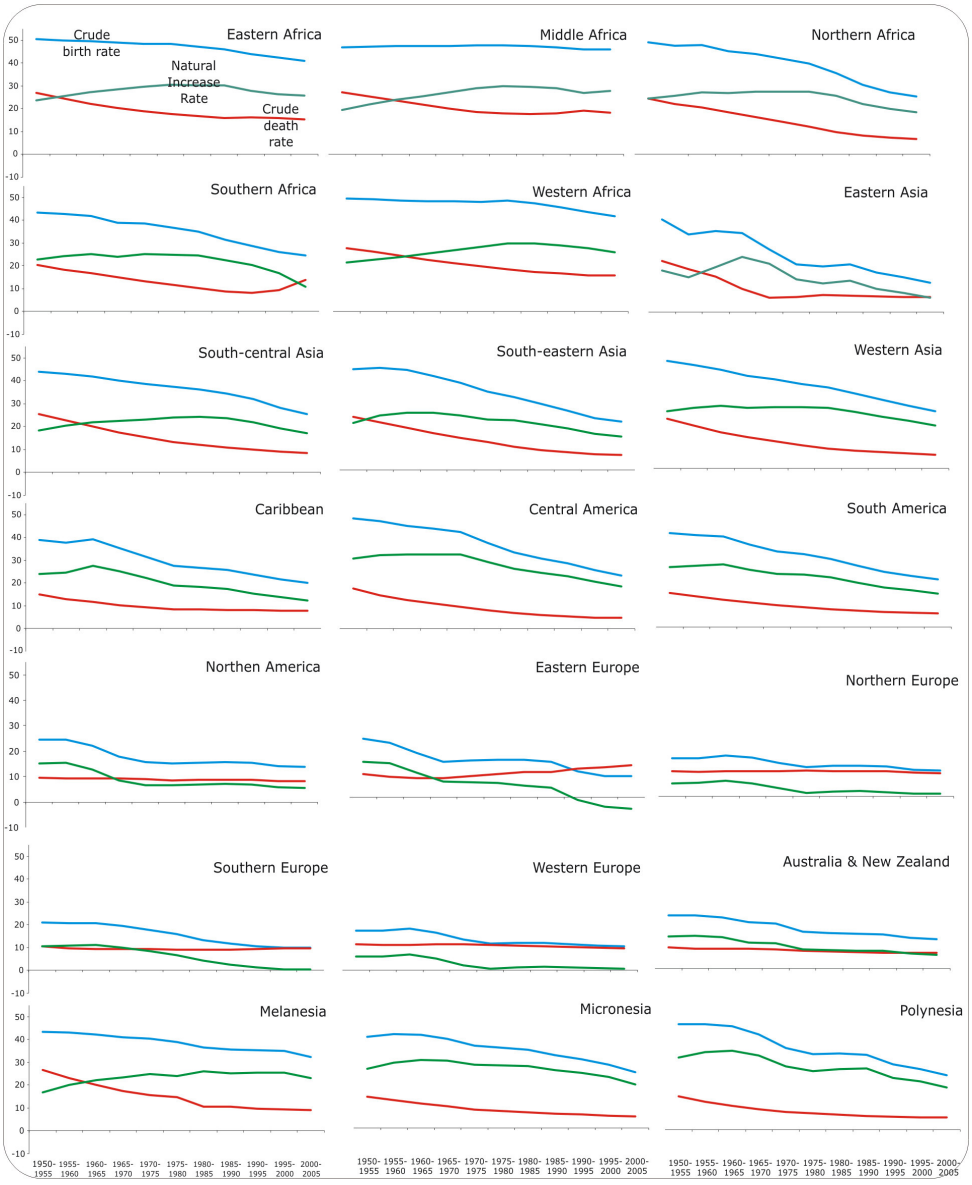

Figure 2: Crude Birth, Death and Natural Increase rates in the geographical areas of earth. Source: Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat, World Population Prospects: The 2006 Revision population Database. Available at: http://esa.un.org/unpp.

Based on the data published by the United Nations, it is quite obvious that demographic transition is evident almost all over the world. European populations, along with the other western ones have moved well ahead in their

transition, in comparison with the other areas of figure 2. By the 1950s, crude mortality rates were quite low and remained almost stable up to the 2000-2005. Only in Eastern Europe crude mortality rates increase after the 1990s. On the contrary, crude birth rates are constantly in decreasing order. In that way, the balance of birth and death rates is also diminishing constantly, approaching, in Europe, the levels of zero population growth in different moments of the late 20th century. In Eastern Europe, indeed, negative population growth rates had been achieved already from the 1990s. In the other areas of the earth, demographic transition is evident too, following different timetables and paces. Middle Africa constitutes the most important exception.

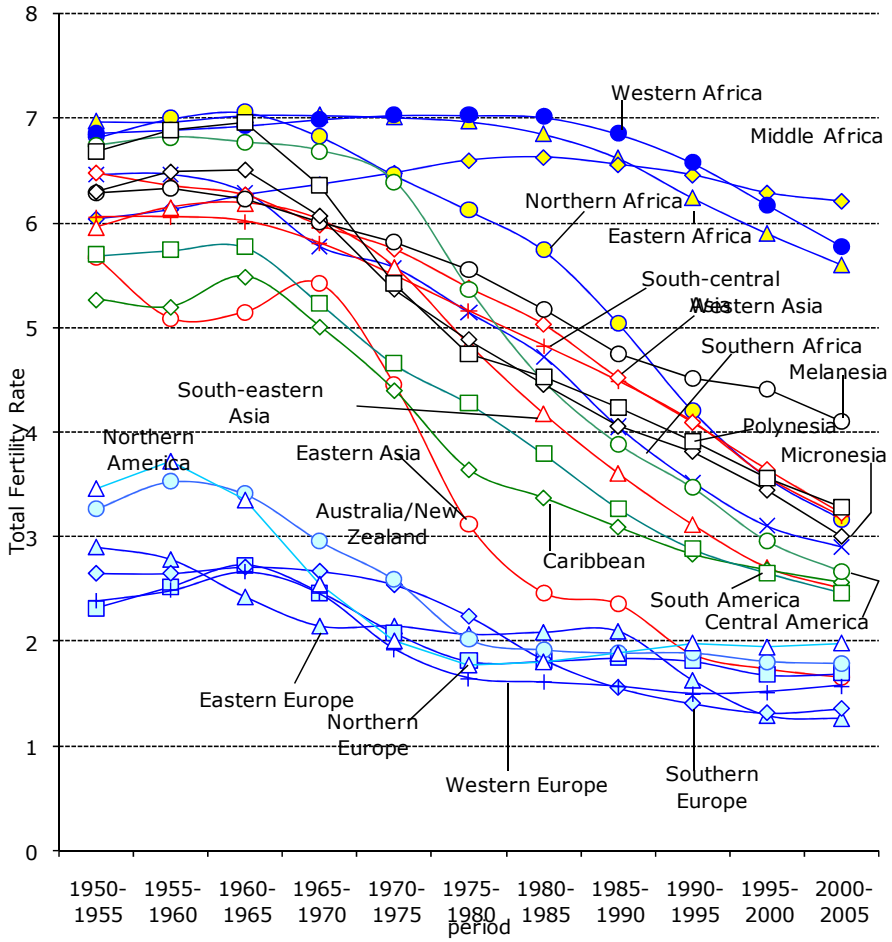

Figure 3: Period Total Fertility Rates in the geographical areas of the world. Source: Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat, World Population Prospects: The 2006 Revision population Database. Available at: http://esa.un.org/unpp.

Nevertheless, crude birth rates, because they are affected by the age structure of the population and its sex distribution, cannot give a clear picture of fertility transition. Rather, they constitute a measure of the increase of a population because of the births, and therefore fail to describe the temporal changes in the reproductive behaviour of a population. Total Fertility rates are more informational, with the proviso that they are subject to changes in the timetable of births during the reproductive span of a woman (Hinde, 1998). If, for several reasons, women of different cohorts postpone their procreation, then period rates will decrease for as long as these women do not bear the children that they actually desire. On the contrary, fertility rates would increase when these women decide to procreate. That is to say, despite the fact that there will be no changes in the reproductive behaviour and the final composition of the family, based on the period rates, important fluctuations will be observed in the fertility of the population. But as it is obvious in figure 3, the trend of period fertility transition is constantly the decreasing one with great changes from period to period. This fact denotes major transformations of the reproductive behaviour of the global population.

Actually, starting at different levels and time, fertility transition, following a diverse pattern of paces, led to the gradual convergence of all the western populations in very low fertility levels. The beginnings of fertility transition in Europe are geographically located in some areas of France[1] by the end of the 18th century (van De Walle και Knodel, 1980). By 1830 the whole country was

[1] In Normandy and in the Parisian Basin Total Fertility Rate was 6-7 births per woman by the first half of the 18th century. At the same time it was 5-5.5 children in south-western France. After the French revolution it decreased by 1 child in the Parisian Basin (Blum, 1988). Fertility transition continued in great rhythms. By the beginning of the 20th century, Total Fertility Rate was a little more than 2.8 births per woman following a continuously decreasing course which accelerated by the time of World War I. After the end of the war, fertility reverted temporarily to 2.6, decreasing afterwards to 1.8-2 before the World War II (Toulemon, 2001). The Baby Boom, after the World War II, resulted in the increase of Fertility rates (Robert-Bobee et al., 2005). The later on Total fertility rates are included in the following table:

Period	TFR	Period	TFR
1950-1955	2,73	1975-1980	1,86
1955-1960	2,71	1985-1990	1,81
1960-1965	2,85	1990-1995	1,71
1965-1970	2,61	1995-2000	1.76
1970-1975	2,31	2000-2005	1.88

Source: Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat, World Population Prospects: The 2006 Revision population Database. Available at: http://esa.un.org/unpp.

in transition. Later on (by 1850), the populations from the Hungarian plains followed, and by the last part of the 19th century fertility transition had spread to Walloon, Switzerland and Germany. By the 1920s, fertility had decreased in almost all the European areas. Great Britain and the overseas English speaking countries experienced fertility transition by the end of the 19th century. Spain, Uruguay and Argentina after the second decade of the 20th century and Japan since 1930.

As Kotzamanis (2000) notes, by the 1930s European continent was demographically distinguished in a central area and a broader periphery consisting of the Central Europe, the Balkans, the Southern Italy, and the Iberian Peninsula. After World War II three major groups are formed. The first one consists of the countries of Western Europe, the second one of the countries of Northern Europe and the third one of the countries of the European south. To these, another one can be added with the grouping of the former eastern countries in it. The demographic developments in the post World War II period resulted in the alleviation of the differences or the emergence of new ones.

Fertility transition was so intense in the majority of the European Countries in a way that by the 1997-1998 the Total Fertility Rate was bellow the generations replacement level, which, considering mortality levels, is 2.1 children per woman (see Weinstein and Pillai, 2001). Today, many of these counties have approached the minimum fertility levels they have ever demonstrated, the era of 'the lowest low fertility', as Kohler et al (2002) have named this phenomenon. In that way, Total Fertility Rates are lower than 1.3 children per woman, trend which have started at the first years of the 1990s.

Nevertheless, the data in figure 3 conceal the immanent differences between different countries in an area or different areas in a country, a fact demonstrated by the data from some south-eastern European countries in Table 1.

Table 1: Total Fertility Rates in some of the South-Eastern European countries. Source: Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat, World Population Prospects: The 2006 Revision population Database. Available at: http://esa.un.org/unpp.

Period	Turkey	Albania	Bosnia & Herzegovina	Bulgaria	Hellas
1950-1955	6,9	5,6	4.82	2,48	2,29
1955-1960	6,6	5,98	4.28	2,27	2,27
1960-1965	6,19	5,76	3.81	2,18	2,2
1965-1970	5,7	5,11	3.17	2,15	2,38
1970-1975	5,3	4,66	2.63	2,17	2,32
1975-1980	4,72	4,2	2.24	2,17	2,32
1980-1985	4,15	3,4	1.99	2,01	1,96
1985-1990	3,27	3,08	1.90	1,92	1,53
1990-1995	2,9	2,78	1.53	1,48	1,37
1995-2000	2.57	2.25	1.54	1.19	1.28
2000-2005	2.14	2.06	1.28	1.26	1.33

Fertility transition in the developing countries started quite late in comparison with the developed ones, after 1960 (Caldwell and Caldwell, 2001), when it was originally thought to be the result of social engineering due to the spread of family planning programmes and contraception methods (Caldwell, 1997). Nevertheless, sub-Saharan Africa clearly constitutes an exception to fertility transition, keeping extremely high levels of fertility. In the other areas of the world more elevated or more moderated transitions are responsible for the contemporary variability observed in figure 3.

3. The interpretation of fertility transition

According to the classical theory of demographic transition, a traditional society, where no birth control is practiced, is developing to a modern one. In the first case, human reproduction was only subject to our species' biological limitations

of fertility. In a transitional society[2], fertility is controlled by the parents; it is actually the product of a rational choice. Fertility transition is, then, connected with the decrease of marital fertility, considering that fertility is mainly expressed inside marriage, and with the existence of effective contraception methods (Coale, 1973).

An alternative, but also competent, mechanism of fertility transition is related to the nuptiality system. In the classical study of Hajnal (1965), even though some interesting political symbolisms cannot - and should not - be ignored, two major nuptiality systems were typified, the western and the eastern one, demarcated with an imaginable line starting from Trieste and ending to Saint Petersburg (Leningrant). In Western Europe, celibacy was high, and so was the average age at marriage. In Eastern Europe the exact opposite situation, i.e low celibacy and low age at marriage especially for women, was evident. Later on, Laslett (1983) categorized European populations in 4 groups, i.e. the western, the west-central, the Mediterranean and the eastern one, based on the demographic characteristics of the nuptiality system, the way that kin groups are formed etc. For example females' age at marriage was low in the Mediterranean and Eastern group. But males' age at marriage was high in the first group and low in the second etc. In that way fertility transition depends on the nuptiality patterns and the decrease of marital fertility. According to the two extreme scenarios that can be formulated, fertility transition results either from the decline of nuptiality without any serious changes in the marital fertility, or from the decline of marital fertility without any serious changes in nuptiality. The first actually did happen in the catholic Ireland. The second one characterizes the more liberate and secular France. In southern Europe, fertility transition usually resulted from the decrease of the number of births (Noin, 1992).

The traditional (pre-transitional) societies are in a natural fertility stage, following the classical terminology of Henry (1961), where no techniques of birth limitation according to birth order are applied. In other words, there is no birth control when the desired family size is achieved. On the contrary, in a non-natural fertility population, fertility levels are the cumulative result of the natural fertility and of the effort to control it. A couple, when the desired number of the descendants is achieved, changes its reproductive behaviour and stops its reproduction well before the completion of its reproductive life, that is to say, before the menopause of the wife (Knodel, 1988). But in the natural fertility stage, couples do not practice birth control, when the number of the offspring exceeds an upper limit. In that way any applied practices that lead to the elongation of birth spacing independently of the birth order, appertain to Henry's

[2] Nevertheless, the first stages of demographic transition in Western Europe have been attributed not to births limitation, but to other factors like the duration and the frequency of nursing, the frequency of sexual intercourses, the food adequacy, the seasonal migrations etc. (van De Walle and Knodel, 1980).

definition. On the contrary, if these practices are applied in accordance with the birth order of the children, then population is in the controlled fertility stage (Knodel, 1988). In both cases, of course, the biological capabilities of human species for reproduction are not saturated and the definition of natural fertility is ambiguous.

The concept of natural fertility, as described above, conforms with the general trend of demographic transition theory for the differentiation of the old and the new, as a process of a linear, unidirectional and consequential evolutionary course of the human societies, in which the modern and, as a matter of fact, the western model of social organization prevailed over the traditional one (Greenhalgh, 1995).

Then, in a traditional society, as Skinner (1997) humorously notes, people have as many children as they will be given to them by god. Surely, it's not what is thought to be the secular and liberal society of the Western Europe, but does all the time divine will govern the fate of people? Or, to put it in another way, do all the time the cultural norms call for non-controlled fertility?

The answer is surely no. Many populations practice contraception, women have abortions and young infants are quite often killed by their parents. Also, children do not have exactly the same value among the human populations and the numerous cultural systems have developed many practices in order to control reproduction. As Skinner (1997) points out, the final number of the children and the sex composition of the family can be achieved through the limitation of the births, the control of survival of the children and their transfer between the existing family units. It seems, then, that all societies controlled their reproduction and that birth limitation is only one of the modern methods of adjustment of the family size (Mason - Oppenheim, 1997).

It is well known that in pre-transitional populations, several contraception methods were used, including this of coitus interruptus, focusing, among others, on the adjustment of the chronological gap between two births (Basu and Aaby, 1998). Japanese populations, originally considered to be natural fertility ones, often practiced infanticide in order for the family size to be controlled or for the sex ratio of it to be adjusted; other times abstained from sexual intercourse, as it is usual all over the world (see for example in Gambia; Bledsoe and Hill, 1998), or used traditional contraceptive methods (Carter, 1998). The practice of infanticide was applied in China (Skinner, 1997), in Nigeria, in New Guinea (Townsend, 1997) and elsewhere. Besides the aforementioned practices, abortion seems to be a very well spread practice. Many traditional methods included the use of injectable plant concoctions or the admission of chemical agents or incisive instruments in the uterus, intensive injuries in the abdominal region etc. (Jones, 1997). Several methods of repression of biological fertility or others which lead to foetus exuviations are known from almost all the

populations of our species. In ancient Egypt, Greece and Rome, several methods, quite bizarre according to the modern standards, included bungs made by crocodile faeces, cedar glue, several suppository and pessary concoctions made by spearmint and honey and dilutions of sulphate chloride and hawthorn. In the Middle Ages several natural products of Salix, Aspen and Rue were used (Perrin, 2001). In Paraguay, the use of herbages (yuyos) as contraceptives was very well spread, while others were used for the sterilization of the women or the exuviations of the foetus. On the contrary, other herbages were used as biological fertility's enhancers (Bull and Melian, 1998). The use of herbages and talisman as a mean of contraception are also known from the Islamic world (Bledsoe and Hill, 1998). In Turkey, traditional methods of contraception were very well spread, as was the technique of coitus interruptus (Goldnerg and Toros, 1994). In Greek Thrace, the Muslim Pomaks used several herbs, usually after the birth of the first child (Zafeiris, 2006).

The effectiveness of these methods is disputable, but it seems that they were efficient in some cases (Bull and Melian, 1998). On the other hand, it is obvious that human populations responded, somehow, to the problem of family planning. That's why Skinner (1997) argued that, in one way or another, it was evident in most of the human societies in the greatest part of the history of our species. Even then, if demographic transition theory fails to interpret accurately the history of human populations, is it the killing or the abandonment of children or the, sometimes, cruel methods described above ethical enough in order to be acceptable?

The question is very difficult to be answered. Surely Christian morality does not favour such practices. Contraception and abortions are forbidden by the Catholic Christian Church (Janssen and Hauser, 1981) as is the case with the Orthodox one. Similarly, in the majority of Muslim populations, children were thought to be divine gifts (Hasna, 2003), especially before the urbanisation and industrialisation of these societies, and people believed all of them to be acceptable (Carter, 1995). Additionally, the Holly Koran forbids any contraception and abortion methods (see the Holly Koran, Sura 6:152, 17:33, 60:12, 81:8/9). But despite the religious norms, it seems that in every Muslim society a form of family planning was all the time evident (Carter, 1995). Among the Islamic countries, many differences concerning family planning exist. Generally speaking, the adherents of family planning are based on the 4th caliph Ali b. Ali Talib, who declared that abortions do not constitute murder (Omran, 1992). Then a religious or cultural frame is formed, thought to govern people's reproductive life. Do, in that way, people live under the trammels of transition?

As Carter (1995) thoroughly observes, according to the classical demographic transition theory, people's reproductive behaviour in the transitional societies results from the passive acceptance of societal and cultural rules. In the exact

opposite situation people can decide by themselves about the number of the children they wish to have, they are, then, active individuals and not passive receivers. They can rationally decide about their fertility levels. In that way, in the course of transition, people are transformed from passive to active individuals. Then modernisation liberates people from the chains of tradition. Or is it the westernisation? Commonly these terms coincide; modernisation is considered to be synonymous with westernisation and this fact denotes, or sometimes hides, the dominant role that western economy and society claims for itself, particularly today, in the time of globalisation.

It is, then, what Greenhalgh (1995) denotes about the economic and socio-economic theories that have developed in order that the demographic transition can be explained. It concerns the major recognitions of the theory. These are: 1. all the societies are transformed from a pre-modern to a modern stage 2. The modern stage coincides with the western way of life where the low fertility is the common situation 3. The course from pre-modern to modern situation is non-reversible 4. The course towards modernity is advantageous to people. Obviously, the dualism of demographic transition theory, i.e. the antithesis between the traditional and the modern society and natural and controlled fertility, introduces ethnocentric and westernised admissions to clarify and qualify not only people's thought, but the progress itself and the way that it has been understood in different populations with totally diverse socio-economic and cultural background.

Economic theories, usually, interpret fertility transition as the result of the changes in the economy of childbearing because of the modernisation of the society (Kirk, 1996). According to the School of Chicago, the diminished demand for children, because of financial reasons such as income, prices etc., leads to low fertility. Actually, this notion abuts on the human capital theory. People invest money and time in order to gain knowledge, skills and abilities, looking forward to future financial gaining. Children are a kind of human capital. Parents invest on them, hoping in the cost benefit when they become older (Kyriazi, 1992). Income correlates negatively with the number of children because their quality is more important. Childbearing, then, is a rational choice, based on economics, psychological and personal criteria. Nevertheless, studies from cognitive psychology and experimental economics reveal that *Homo economicus* confronts many difficulties in order to clarify the exact analogy of costs and benefits (Alvard, 2003); especially when other practical, ideological and cultural factors strongly intervene in human reproduction.

The unilateral economic representation of fertility transition does not take into consideration that the nature of our species is not only economic, or social, or cultural, or biological, but the synthesis of these factors. The birth of a child is the product of our biological characteristics and of a series of other factors, like people's personal attitudes, and results from several social pressures, cultural

rules and economic characteristics. Taking into consideration that fertility transition is almost a universal phenomenon, every attempt to explain it should encompass the idea of the universal social, cultural and environmental diversity. All these explanation models of fertility transition could fit very well in free market economy societies, or the pre-transitional western populations, but it is rather improbable that they could also be fitted in others with totally different social and economic structures, even if they gradually adapt the western model of economic organisation.

Several other explicatory attempts of fertility transition moderate the role of economic factors in favour of the social ones. Nevertheless, the role of economy is still considered to be essential. The decision of the parents about the acquisition of offspring depends on the income and the prices but also on the social rules which affect the couple's perception for family and children (for an evaluation see Kirk, 1996; Lesthaeghe, 1998). Others emphasize the role of social interactions in fertility levels. For Watkins (1990), the social environment, the "others", affect reproductive behaviour. In the past this environment was defined locally, but, progressively, it was expanded, it became national. So did the social interactions. According to Bongaarts and Watkins (1996), there are at least three aspects of the social interaction. In the first one, new information is spread in a population. Surely, ideas, ideologies and religion, like Christianity, feminism and democracy, affect the determinant factors for the demand of children. Among them, the notion of contraception, which was spread out through the programmes of family planning, is included. Other ideas can act indirectly, like the spread of the western family type pattern (see also Lesthaeghe, 1983). Later on, all these are evaluated and adapted in compatible with the local frames terms. Then, social interaction affects the personal attitudes. When fertility starts to decrease, despite that the environment responds negatively, the new practices are originally spread out slowly and later on they are concurred because of the increased number of innovators. As a matter of fact, there is a joint effect of socio-economic circumstances and of several processes of cultural diffusion and differentiation. The socio-economic development abets and enhances fertility decline because of the elevation of the cost of the children. But also socio-economic development enhances the cultural diffusion and social differentiation. In that way fertility transition is evident.

Cultural reasons are considered to be essential in fertility transition. Knodel and van de Walle (1986) espied that western populations with similar socio-economic characteristics followed different timetables of transition, while more remote areas with similar cultural characteristics analogous ones. Based on similar observations, Cleland and Wilson (1987) proposed that economy plays a lesser role in fertility transition. More important is the role of culture. In that way fertility transition is affected by cultural barriers and pertained to issues connected with the socio-economic development, i.e. with the adoption of new cultural characteristics, the educational level of the parents etc.

For Caldwell (1976, 1978, 2004), fertility transition does not result from the economic modernisation of a society, but it concerns its westernisation, the adoption of the western way of life, which is connected with the ideas of the progress, of the secularism, of the mass education and the dominance over the environment. According to his "wealth flow theory", based on studies from Africa, in pre-transitional societies children were used, through provision of labour, for the economic development of their family units. Evidence from traditional populations from America (Kaplan, 1994) and Africa (Alvard, 2003) does not support this point of view, but it seems that children strengthened the social position of their fathers, they were useful in developing social networks in a population and guaranteed the survival of their parents when they would become older. The spread of western ideas, actually the cultural diffusion of the nuclear family - which has the children as epicentre - led to the reversal of the situation, in which the wealth flow is from the parents to the children. This, in turn, caused a drop down of fertility rates because, in an analogous way, the children are less important in family production. Then the idea of the, economic type, demand of the children is combined with the diffusion of rules and behaviours among human populations.

It is quite probable that the final levels of fertility reflect the effects of the inherited institutional structures of the society, which would be the social organisation ones, the family type ones, the role of the genders etc. Some of them allow fertility transition. Some others delay the transitional process (McNicoll, 1994). Gender roles and also women's position in society and education are then important determinants of fertility transition (Mason - Oppenheim, 1987). The role of women, their empowerment, the use of contraception and other factors are responsible for the development of the personal perceptions and especially of the female ones concerning reproduction, which led to the decrease of the number of the children (the preference theory; Hakim, 2003). Religion is another aspect. Mainly because of the dominance of the religious rules, the majority of high fertility contemporary populations are Muslim, where a chronologically delayed transition is observed (Caldwell, 2001). According to McQuillan (2004), the religious effect is important when three conditions are satisfied. The first one refers to the behavioural rules, which a religion imposes, concerning the fertility of the believers. The second one refers to the religious structures that lead to the spread and the establishment of these rules and the last one to the importance of religion as one of the many components of social identity. In another contribution, Lehrer (2004), based on the Chicago theoretical framework, denotes that religious identity affects the economic and demographic behaviour of the married couples because it is responsible for their perceptions concerning the costs and the gains of childbearing.

It is almost an established fact that culture is an essential determining factor of fertility transition. But it is also obvious that demographic analysis has to

emanate from a general social theory which would incorporate human populations in a frame of systemic relationships, which include not only culture but also social relations. All the efforts would have to be concentrated on small population groups in order for the relationships between demography and culture to be more easily established (Fricke, 1997). In that way, it is necessary emphasis to be given to the political and social forces and also to the social structures and cultural norms (Kertzer, 1995). That's because fertility is not just one of someone's personal characteristics, it also expresses his relationships with his descendants, his relatives and other social groups. The birth of a child must be understood in the frame of the factors which are responsible for it and also in the frame of its consequences. Both are connected with social and cultural institutions. Fertility is the result of negotiation and renegotiation between people, in other words it is a social relationship. In an analogous way, sexual relationships are governed by cultural models and norms and by them new social units and bonds are established. Then, the value and the costs of the children differ significantly between the human environments taking into consideration other acting factors as well like the psychological ones (Townsend, 1997).

Besides culture, several other factors are thought to be important in the approach of fertility transition. Political economy enrols the economic forces in a broader frame which incorporates social and cultural factors (Kertzer, 1995). Several structures of human life are also based on gender, which means that fertility is affected by it (Greenhalgh, 1995). According to Riley (1997), gender affects the way that societies are organised and it is part of all social institutions, i.e. the economy, the political structures and the family. Also, it is connected with the agency of the members of the population, which means that the developed practices result from the dialectic relationship between the people and the environment in which they act (Carter, 1995).

Obviously, macro-level studies often conceal the multidimensional pattern of human existence. It is also apparent that any generalisation is characterized by several limitations simply because of its inability to take into consideration the cultural and social diversity of human species. All the approaches described above, are explaining demographic transition on the basis of the prevalence of new ideas and perceptions about children in a population because of cultural, economic and social transformations. Reproduction is considered to be an immanent and physiological process, which, in several moments in the life cycle of the people, is depending on a series of exogenous factors. The last designate or transform the personal perceptions of family and, of course, its limitation.

It has been proposed that the cultural characteristics are transmitted or spread following the laws of genetic inheritance (Boyd and Richerson, 1985), even though differences are observed regarding the inheritance of acquired cultural characteristics and some other aspects. The laws of genetic evolution support the

survival of the advantageous characteristics. But if the selection of some cultural characteristics theoretically improves the fitness of their carriers, is it possible that the fertility transition can be explained, considering that it actually leads to the decrease of the biological fitness? According to Boyd and Richerson (1985), the achievement of social and economic status and the social migration decrease the Darwinian fitness, because the success of the people and their professional rehabilitation are correlated negatively with the number of offspring. The members of small sized families could spend more time and financial resources in order to implement their roles. In an antagonistic society people with less or no children are thought to be better adapted than the others, so fertility transition is the result of the selection pressures for cultural adaptation.

Several other theories based on the life history analysis of our species are trying to qualify fertility transition on evolutionary grounds. On the one hand, according to the parental investment theory, the number of the children depends on the available natural resources; on the other hand it correlates negatively with their quality. The best number of offspring depends, in a way, on the relationship between the parental investment and their survival, a relationship which is not linear (Hagan et al., 2001). In contradiction to the 'wealth flow theory', living organisms are adapted to use resources to the benefit of their descendants because in that way they assure the perpetuation of their genome (Kaplan, 1994; for a possible evolutionary course of parental investment see Kaplan and Lancaster, 2003).

According to one opinion, because of the extreme antagonistic characteristics of modern societies and the high cost of parental investment, fertility rates decrease in the long run to such a level in which the fitness of the people is being maximized (see Borgerhoff – Muelder, 1998). Fertility transition could also result from stabilizing selection in order for the best family size to be achieved and thus the maximum reproductive success. Later on, family size may decrease once again. Nevertheless, evidence from empirical studies does not support this notion (Mueller, 2001; Borgerhoff – Muelder, 1998). Alternatively, directional selection may lead to extreme values in the phenotypic distribution (i.e. the number of the children per family), or the disruptive selection may lead to more than one best values (Mueller, 2001; Borgerhoff – Muelder, 1998).

Several other propositions connect parental investment theory with social variables, the family pattern (Turke, 1989 and 1990), with evolutionary economics (Kaplan, 1996) etc., in order that fertility transition can be explained.

According to Kaplan (1996), in modern societies the labour market needs people with special skills and knowledge, a fact which increases the cost of parental investment. Higher income and education parents are forced to invest more in their children than the others. In that case, biological fitness is connected with low fertility because of the high expenses for the children and the over-

consumption. As a matter of fact, all people know that high fertility correlates negatively with the benefits that they will appreciate from their children after their accession to manhood. That's why they develop a strategy for the diminution of their fertility (see also Kaplan and Lancaster, 2003).

For Low et al. (2002), in pre-transitional societies the reproductive success of males was connected with the social position and the wealth, and a typical woman only held a reproductive role. In post-transitional societies the cost of parental investment is extremely high. Women can control their fertility in order to achieve reproductive success and exploit the resources to a maximum level. In these societies wealth is not connected with fertility and many women can benefit more if they acquire resources than if they fulfil their traditional role as mothers. That's why fertility is low. The level of investment for the production of successful descendants varies according to the environment and it is connected with the competition that children would confront, their education, the labour market characteristics etc. This phenomenon is well known from other biological species, which, in a very competitive and densely populated environment, decrease their fertility levels and increase the levels of parental investment to their offspring. In that way it is doubtful that the very low fertility, which is nowadays observed in western countries, will maximize the number of the members of one genealogy or its survivorship. Probably something else is being maximized, like the number of the children in combination with the resources, in a way that exogenous mortality would be decreased and the low fertility would be balanced by the high generation length.

Carey and Lopreato (1995) support the notion of the 'two children psychology' as a physiological adaptation of human species in combination with several environmental, cultural and other factors. For Potts (1997) the argument that socio-economic development brings on fertility decrease is tortuous, because in order for one couple's desires, concerning the number of offspring, to be met, effective contraception methods are required. These are relatively recent and not universally spread. The wealthier members of the population originally had easier access to contraception methods and thus the negative correlation between fertility and income had emerged. Then, as Borgerhoff – Muelder (1998) summarizes, the low fertility is a side effect of environmental changes without any adaptive function.

4. Some concluding remarks

The central position of the evolutionary approach is that humans act in an opportunistic way in order to confront environmental pressures. That's why they develop several reproduction strategies and their behaviour is evolved with Darwinian terms as the result of their interaction with the environment and their adaptation to it. As Roth (2004) thoroughly observes, in anthropological demography culture is considered to be a distal variable acting on the

demographic behaviour. Biology is taken into consideration with variables like the age of the mother in the birth of her first child, the duration of the lactation of the children etc. which play the role of intermediate or proximate variables, under the agency of which the final levels of fertility are determined. Culture is considered to be a proximate variable in the evolutionary approach, acting on the final levels of fertility. Culture then is the product of biology, in a way that biological fitness is being maximized.

An epistemological matter concerns the various approaches of fertility transition described above. Despite their controversial character, it is important our species to be sighted in a more holistic prism. Surely the social, cultural and economic sides of the human existence are of great importance, but so is the biological side of life. Any large-scaled scientific approach should confront human species in its entity, not only in its ingredients. That's why the analysis from the side of social sciences often disregards the analysis from the side of life sciences and vice versa.

Another aspect is the globalisation. Generally speaking, fertility transition has, by now, a universal character and reflects the gradual westernisation of societies. But many things need to be done in order for the human diversity to be taken into consideration and the ultimate causes of the phenomenon to be understood. This diversity, cultural, social and economic as well as environmental and adaptational, determines the fate of human populations. That's why anthropology should be embraced, and as a matter of fact has been embraced, in this process, expanding the studies in small populations. The macro-level studies are not sensitive enough to describe human variability. This is one of the reasons that classical demographic transition theory actually fails to be applied in all the human populations of the earth. On the contrary, it was a quick and western glimpse on them. This westernised approach, surely ideologically abutted, expresses the dominant role that western society and economy claimed around the world, frequently concealing or disregarding the local conditions and dynamics.

On the other hand, the gradual westernisation of societies seems to have led to the gradual, volitional or forced, adoption of the western life cycle. Fertility transition, either as an economic consequence or as a result of socio-cultural transformations may be seen as the first evidence of societies' westernisation and the abandonment of traditional lifestyle. Another open question still remains. Does development, all the time, coincide with western type modernity or there are alternative ways of accomplishment?

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A Short History of Mortality and Death.

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Abstract

During the evolution of our species, the observed elongation of life span in comparison with our relatives, the primates, was accompanied by several changes in the mortality, epidemiological and health characteristics. The Neolithic revolution caused tremendous changes in the social, economic and cultural grounds of human existence and probably led to the upheaval of mortality, even though this is disputed. Probably a high pressure system of high mortality and high fertility was evident. Later on, life expectancy at birth fluctuated in very low levels compared with the modern standards of the so called developed world. After the industrial revolution, survival chances were progressively improved, a trend that was mostly accelerated in the 20th century. Today, nevertheless, great differences are observed around the world, indicating different levels of mortality transition and, also, great inequalities between national and sub-national populations. Then, the classical epidemiological transition theory, first proposed by Omran (1971), fails to interpret temporal and contemporary mortality trends around the world because of its conservative view and its west oriented documentation, disregarding, mostly, the local particularity of health status and the features of the political, socio-economic and cultural regimes, failing then to place death and morbidity in the broader context of systemic relations that control the health status of a population. Instead, global population confronts new challenges and threats in the field of health and illness that need to be taken in consideration by the national authorities and the regional or global organizations.

Keywords: *mortality transition, health transition, life expectancy.*

How Long Does a Man Live?

a. The Paleolithic era

During the evolution towards our species, an evolutionary adaptive elongation of life was observed (Kaplan et al., 2000; Kaplan and Robson, 2002). Humans live longer than their primate relatives. Modern human foragers, who live without modern medical treatment and modern weapons, have twice the life expectancy at birth in comparison with chimpanzees, and more than twice the life expectancy when they reach adulthood (Hill et al. 2001). From Australopithecines up to early Upper Palaeolithic man, human longevity was increased resulting in the population expansion, the exploitation of new ecological niches and gradually in the development of several behavioural and cultural innovations such as symbolism, art, hunting and gathering (Caspari and Lee, 2004). It seems that population size and density were very low during the whole Paleolithic period. Population growth was, probably, very slow or even very close to 0[1] (Cavalli-Sforza and Bodmer, 1999).

It is very difficult to form accurate estimates of the life span of early hominids because of the scarce anthropological/skeletal material. It seems that the majority of Neanderthals, or possibly other middle Pleistocene hominids, died before the 40th year of their life (Trinkaus, 1995). Acsadi and Nemeskeri (1970) suggest a life expectancy at birth of only 21 years during the Palaeolithic Period. Some clues about the survival in prehistoric times can also be taken from the analogy of the prehistoric populations with the contemporary hunter gatherer ones, where a very low life expectancy at birth is observed. Life expectancy at birth can be as low as 21 years in the Casiguran Agta of Philippines (Headland, 1989). In other populations it is higher, like the Hadza of Eastern Africa, the !Kung (ranging between 30 and 33 years; Pennington, 2001) and the Ache of Paraguay (37 years; Hill and Hurtado, 1996).

The disease burden of the Palaeolithic populations was probably connected with several pathogens, with a long period of latency or low virulence (i.e. chickenpox and herpes simplex virus etc.), with parasites like some intestinal helminthes (nematodes *Enterobious vermicularis etc.),* ectoparasites (i.e. *Pediculus humanus,* the body and hair lice) and enteric pathogens like *Salmonella*. It is also possible that these early populations could have been affected by several others parasites, like trypanosome, through chance encounters with infected non-human hosts or vectors. On the contrary, because of the organization of the hominid populations in small nomadic bands, the risk of dispersal of acute communicable pathogens was small, especially for those for

[1] According to Boone (2002) zero population growth can also be attained by catastrophic mortality. Indirect evidence shows that infrequent - but severe - population crashes may have taken place throughout human population history.

which human population is the only disease pool. Acute upper respiratory infections declined soon after they were introduced in those isolated populations and others like small pox or measles could hardly afflict them (Barrett et al., 1998). Because of the social, demographic and behavioural characteristics of these hominids, and as long as they exploited new environments and ecological niches and were exposed to new environmental and climatic conditions, it seems quite probable that the rate of emergence of infections and parasites would have accelerated.

b. The Neolithic Revolution

About 10,000 years ago, the first evidence of plant and animal domestication appears in the archaeological record, also suggesting the switch from nomadic to sedentary life (Pennington, 1996; see also Weisdorf, 2005 for a summary of the literature concerning the origins of agriculture). Neolithic agricultural revolution had tremendous effects on social, behavioural and dietary grounds (Barrett et al., 1998) and also on population dynamics and growth (Cavalli-Sforza and Bodmer, 1999; Livi-Bacci, 2001), even though in the last case it is under dispute if population growth caused by or was the effect of animal and plant domestication (Pennigton, 1996). According to the classic scenario of Ammerman and Cavalli-Sforza (1971), the gradual transition to agricultural economy was accompanied by a rapid population growth because of the elevation fertility or the reduction of mortality. At a second stage, the population growth rate diminished due to natural environment limitations, even though, in more recent approaches, the dynamic relationship between population density, prey density, individual energetic efficiency and reproduction rates is taken in consideration (Boone, 2002).

According to Fix (1996), the diffusion of agriculture and the association of newly domesticated animals increased disease intensities. It seems that the first epidemiological transition (Barrett et al., 1998) was evident during Neolithic transition. The progressive accumulation of people in permanent settlements, and the larger disease pools of sedentary populations, resulted in the increased prevalence of infectious diseases (Pennington, 1996). Because of the domestication of animals, zoonotic infections were transmitted to human hosts and pre-existing pathogens were able to evolve into more virulent forms (Pennington, 1996; Barrett et al., 1998; Bocquet-Appel, 2002). Along with them, tuberculosis, anthrax, Q fever and brucellossis were included. Agricultural practices increased contact with nonvector parasites such as carcariae and intestinal flukes and may have enhanced the risk of insect bites and diseases such as scrub typhus (Barrett et al., 1998). Human wastes cultivate diseases and accumulate rapidly in sedentary populations. Water supplies are easily contaminated, facilitating the spread of waterborne pathogens to people (Pennington, 1996). Food storage resulted in the increase of contamination and food poisoning (Barrett et al., 1998). Skeletal indicators of nutritional status,

such as enamel hypoplasias, porotic hyperostoses and Harris lines are generally more frequent in sedentary populations of the era. Even though the osteological paradox cannot be ignored (Wood et al., 1992), indicating that these marks reveal better health (Pennington, 1996), simply because their existence on the skeletons indicates that these people actually survived the stress, evidence from the contemporary subsistence level agrarian populations shows that nutrition deficiencies are common and often exacerbated during periods of seasonal hunger or periodic droughts. These problems may have increased with agricultural intensification in some areas. It seems, then, that women and children and, after the development of stratified societies, lower classes were afflicted more by diseases during the first epidemiological transition (Barrett et al., 1998).

Evidence from Mesolithic and Neolithic cemeteries in Europe and North Africa supports this two stages transition (Bocquer-Appel, 2002) but also, as it has been proposed, in all independent centres of agriculture invention (Bocquet-Appel and Dubouloz, 2004; see also Bocquet-Appel and Naji, 2006). By the expansion of the agro-pastoral economic system a new demographic regime tends to rise (Bocquet-Appel and Dubouloz, 2004), a 'high pressure system of high fertility and high mortality' as McCaa (2002) called it. Nevertheless, as Pennington (1996) recognizes, the demographic evidence connected to the transition to agriculture is scarce and difficult to interpret. It is very difficult to accurately estimate mortality levels, or the age specific mortality. It is possible that, as studies in contemporary nomadic populations who became sedentary like !Kung indicate, early child mortality was reduced mainly as a result of increased access to milk or other high protein weaning food. On the other hand, the overall levels of mortality seem to have increased.

As Livi-Bacci (2001) notes, the diametrically opposite theory attempts to explain the rapid population growth during the Neolithic era as a result of improved survival, because of the better nutrition made possible by the agricultural system. Eshed et al. (2004) suggest that life expectancy at birth increased from 24.6 before transition to 25.5 after it. Average age at death of adults was respectively 31.2 and 32.1 years. While females experienced a decrease in mean age at death in the Neolithic period, males experienced an increase. Then, despite the fact that adult females had higher mean age at death in comparison with adult males in the pretransitional era, in Neolithic it was the reverse, probably because of the elevation of maternal mortality due to the increase of fertility that was observed during the Neolithic. The low average age at death of males in the pretransitional period can be attributed to everyday activities like hunting or inter social conflict.

Caldwell and Caldwell (2003a and 2003b) dispute the Neolithic mortality crisis. Since they think that the evidence concerning the moderate fertility of hunter gatherers is slight, they propose that these populations did not in fact practice

any birth control. That means that fertility was high. In that way, in the long run, because growth rates were close to zero in the vast majority of human populations, mortality should be high, too. Hunters gatherers' society was a world of violence. Malthusian constrains regulated population size. With the transition to the Neolithic era, only death aetiology changed in favour of infections or other reasons. But the death and birth rates remained approximately equal before and after the Neolithic transition.

c. The Greco-Roman World and the contemporary developed countries up to the Industrial Revolution.

Disease outbreaks became more severe as regional populations increased and aggregated into urban centres (Barrett et al., 1998). These outbreaks, or sometimes severe epidemics, are confirmed by historical data as is the case in the Classical, Helenistic and Roman World[2]. Later on, the medieval years were quite hard for the European dwellers. In the 14th century not only the Hundred Years War, but also pandemics and famine caused millions of deaths. The more or less understood as one of the possible signs of the four horsemen of the Apocalypse (Getz, 1991), the Black Death[3] pandemic was one of the most notorious disease outbreaks of the era. Another important parameter, not only in the medieval times but also during the greater part of the human existence, was migration. That, along with trade between distant areas, led progressively to the convergence of regional infectious gene pools or to the introduction of new pathogens to several populations, like small pox and typhoid which killed million of native people in America (Barrett et al., 1998).

[2] Around 430 B.C. Thucydides's plague in Athens, caused probably by *Salmonella enterica* as it has been proposed recently on the basis of ancient DNA analysis (Papagrigorakis et al., 2006), killed thousands of people: from the 13000 hoplites (soldiers), 4400 died during the epidemic (Scott and Duncan, 2001). In the time of the Byzantine Emperor Justinian another epidemic struck the latter on Holy Eastern Roman Empire killing thousands of people. It is said that during the four months period that the plague lasted in Constantinople 300,000 people died, a number more or less exaggerated (Scott and Duncan, 2001). And finally, wars and severe crisis of food inadequacy were quite common in Hellenic and Roman world (Garnsey, 1988). It is then not surprising that life expectancy at birth in the ancient Greece was only 24.4 years (Woods, 2006; where references) and in the Roman world 21.1 years (Frier, 1983), while females from Roman North Africa expected to live 23.2 years after their birth (Woods, 2006; where references).

[3] The Black Death, i.e. bubonic plague caused by *Coccobacillus yersinia pestis* or – as it has been recently proposed – another (Cohn, 2002), probably a viral infection (Scott and Duncan, 2001) like viral haemorrhagic fever (Duncan and Scott, 2005), erupted probably in Sicily around 1347 and soon spread through Europe (Scott and Duncan, 2001), re-emerged several times throughout the Middle Ages and did not disappear but only several centuries later (Getz, 1991). Black Death depopulated Europe for at least 30% (Gottfried, 1985).

The medieval city of York, England, is a typical example of an urban centre where two specific aspects are often found: the recurrence of catastrophic epidemics and the poor sanitation. Famine was a major precursor of disease in virtually all medieval centuries, exacerbated by crowded living conditions. Palaeopathological evidence suggests the commonality of the iron-deficiency anemia among the children, while several non-specific infections, parasitic infestations and endemic treponematosis were frequent in the total population. On the other hand, all the bone fractures have healed as some medical treatment was given to the patients with the immobilization and probably the reduction of the fractured bones (Grauer and Roberts, 1996). In St. Andrew, York, social status and gender resulted in serious – but not as pronounced as it would be expected - mortality differentials between different secular groups of the population. On the contrary, religious men enjoyed the highest longevity among all others members of the population (Sullivan, 2004).

Given the circumstances, life expectancy at birth is estimated at 24.5 years in Collehio (Parma) by the VII century A.D. (Gualandi and Calanchi, 1989). At the end of the 13th century it was probably around 35-40 years, diminishing after the eruption of Black Death in some cases under the 20 years, even though this estimation is a little bit pessimistic (Herlihy, 1998). By 1427, it was 29 years in Pistoia (Woods, 2006; where references), and in Geneva, between 1625 and 1684, 26.1 years (Social Class II, Bocquet and Masset, 1977). At the second part of the 18th century it was fluctuating between 30 and 40 years in Sweden[4], while in Finland it varied between 32.4 and 38.3 years for males and between 33.2 and 40.4 from the second half of the 18th century up to 1820 (Kannisto et al., 1999). In Germany before 1800 it was around 35 years, rising to 38.7-40.1 by 1800-1849 (Knodel, 2002).

d. After the Industrial Revolution

d1. The 'Developed' World

It was, more or less, up to the industrial revolution – which originated in Britain probably in the late 18th century and later on in Western Europe, that life expectancy at birth was small, fluctuating between 20 and 40 years of age. Omran (1971) called this period the "*Age of Pestilence and Famine",* when wars, malnutrition, epidemics and famine resulted in a very slow population growth rate or even, in some cases, negative growth rates.

[4] Data Source: The Human Mortality Data Base (2006). Department of Demography, University of California, Berkeley, and Max Planck Institute for Demographic Research. Available at: www.mortality.org.

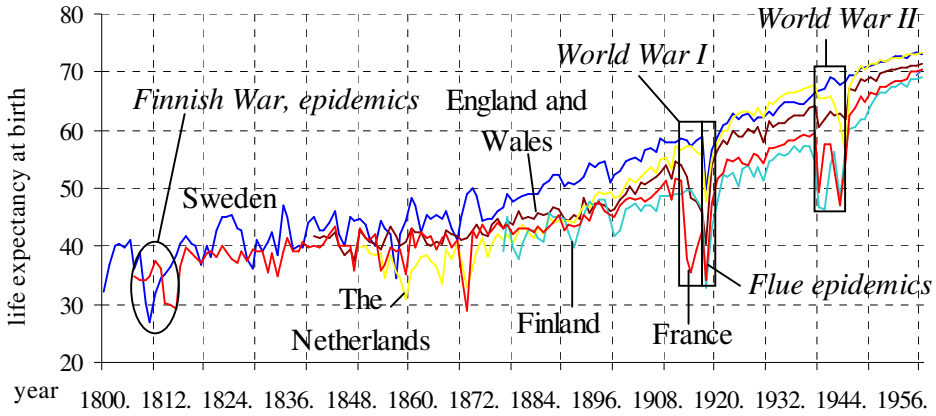


Figure 1: Life expectancy at birth in selected developed countries. Data sources: The Human Mortality Data Base (2006). Department of Demography, University of California, Berkeley, and Max Planck Institute for Demographic Research. Available at: www.mortality.org. For France 1806-1898: Vallin and Meslé (2001).

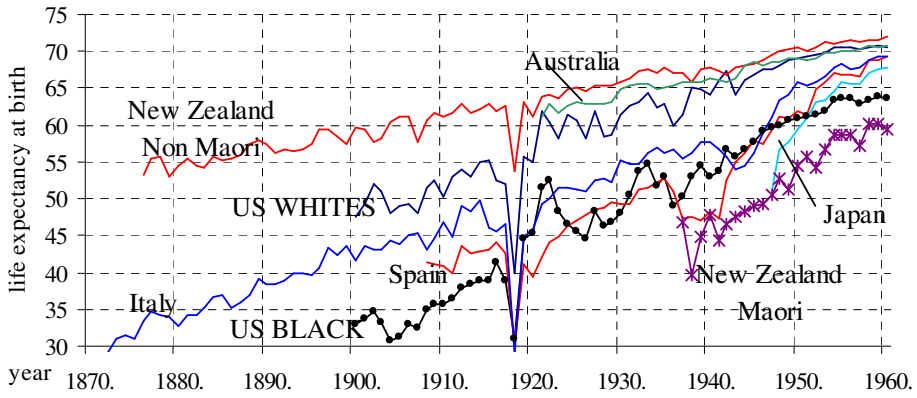


Figure 2: Life expectancy at birth in selected developed countries. Data sources: The Human Mortality Data Base (2006). Department of Demography, University of California, Berkeley, and Max Planck Institute for Demographic Research. Available at: www.mortality.org. For USA: Arias (2006), keeping her original terminology.

Later on, mainly around the 1850s, following different chronological onset and pace of transition, mortality started to decline in the western world (Figure 1). Sweden, Denmark, Norway (not included in Figure 1 for interpretation reasons), England and Wales, and France were among the pioneers, while others, probably like Finland and the Netherlands, very soon followed. By the 19th century, the Napoleonic Wars (1805-1815), the Franco-Prussian war of 1870 (Glei et al., 2006a), the Finnish war and epidemics in Sweden (in years 1808-1809; Glei et al., 2006b) and the famine in Finland in 1866-1868 (Andreeva, 2006), with

severe consequences for mortality levels, are only a few examples that some of the inflictions put upon the people in the past still existed in the western world. During the first half of the 20th century, World Wars I and II resulted in a severe elevation of mortality, as it can be seen in life expectancy at birth in France (Glei et al., 2006a) and England and Wales (Philipov, 2006), in the calculation of which the military deaths were included. The effects of wars on the mortality of the two sexes varied because of the historical circumstances. For example, in France during the World War I, male mortality exceeded considerably in comparison with female, while in World War II mortality increased in both sexes (Glei et al., 2006a). On the contrary, neutral countries during the great wars, like Sweden, were minimally affected (Glei et al., 2006b). Lastly, the epidemic of influenza marks in 1918-1919 the mortality history of the world.

In other European countries, especially those from the southern and eastern parts of the continent, a chronologically delayed transition was observed (Vallin and Meslé, 2004). Italy and Spain (Figure 2) constitute two typical paradigms of them in comparison with the countries included in Figure 1. On the other hand, New Zealand and Australia represent the upper limit of mortality transition, holding the highest values of life expectancy at birth before World War II. Mortality transition has also advanced considerably by the 1920s in the USA, which coincides with the two afore mentioned countries. But at the same time, it is quite representative of the limitations when using national state data in order to estimate temporal mortality trends, that the Maori population of New Zealand and the Afro-Americans of the USA were characterized by extremely higher levels of mortality in comparison with the Caucasian population of their countries. It is an obvious paradigm that political, social, economic or other inequalities and differences are stamped on mortality differentials, governing the demographic fate of human populations. Lastly, Japan entered mortality transition later, showing greater pace and life expectancy's gaining. Before 1870, life expectancy at birth varied between 30 and 40 years in Japan. Mortality transition in Japan was initiated at the end of the nineteenth century, when life expectancy was estimated around 36-37 years by 1900, approaching gradually the 60 years by the late 1940s (Zhao and Kinfu, 2005).

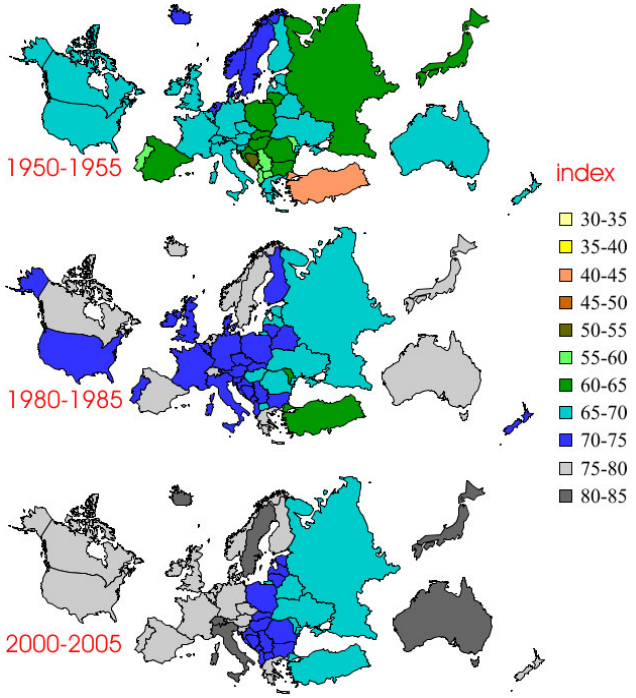


Figure 3: Life expectancy at birth in selected periods.Europe and other developed countries. Source: UN (2006a).

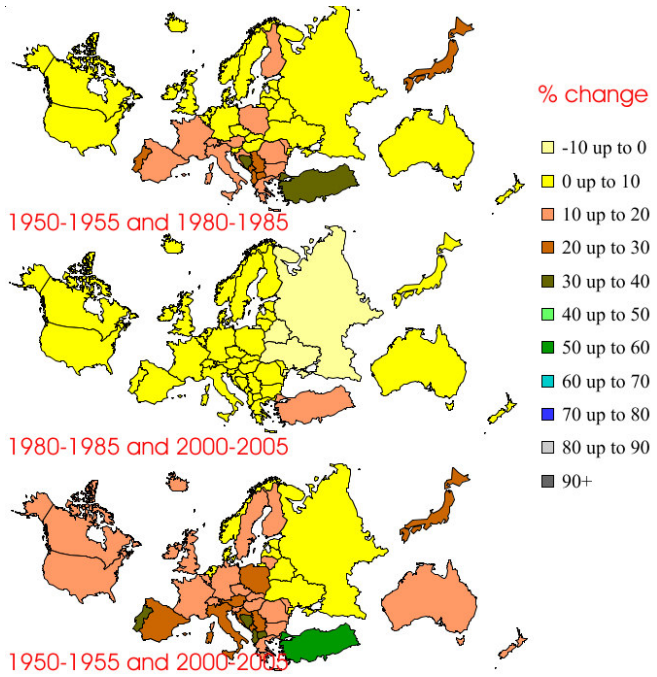


Figure 4: Changes (%) in life expectancy at birth between selected periods. Europe and other developed countries. Source: UN (2006a)

Mortality transition in Europe and in the so-called developed world took place under different political regimes, economic systems and socio-cultural conditions[5]. By the 1950s life expectancy has further been improved in almost all the European regions or the countries of the developed world (Figure 3). Nevertheless, Turkey still was an important exception, and in few areas of south-eastern Europe, like Albania and Bosnia Herzegovina, along with Portugal, life expectancy remained under the 60 years. At the other edge, in some of the countries - like Sweden, Norway and Denmark - that first undertook the mortality transition, it had exceeded the 70 years. But the gap between them and the rest has narrowed considerably. Russia, other eastern European areas and Spain remained between the 60 and the 65 years, while all the others fluctuated between the 65 and the 70 years. Between 1950-1955 and 1980-1985, the undergone mortality transition resulted in a diversiform increase of life expectancy, ranging between 10% and 30% in the Mediterranean Europe, the Balkans and some other European countries or areas, along with Japan (Figure 4). Turkey was a special case gaining 17.4 years in that time frame. Lesser improvements were observed in the rest of the developed world and in the former Soviet Union. By the 1980s, in the majority of the countries, an even stronger convergence trend in mortality levels was observed, in which differences in life expectancy at birth have diminished to fewer than 6 or 7 years. But it is also obvious that in some areas of Eastern Europe life expectancy was lower than in the others (Figure 3). Until 2000-2005, with the exception of Turkey, the pace of the transition has slackened off at levels below +10%, while life expectancy has shortened in Russia, Ukraine and Belarus (Figure 4). In 2000-2005, even if the differences were relatively small in comparison with the past, three major areas of the developed world were distinguished according to the mortality levels. Western Europe and the other non-European developed countries, exhibited once again the highest life expectancy. On the contrary, the former USSR Democracies exhibited the lowest. Between these areas, the countries of the former Eastern Europe were located. Overall Mediterranean Europe, some of the Balkan countries, Portugal, Poland and Austria exhibited the greatest gains in life expectancy between 1950-1955 and 2000-2005. On the opposite side were Russia, Ukraine and Belarus (Figure 4).

[5] Even though borders have changed in many countries almost all over the world throughout the 20th century, the final adjustments of them are embraced in all the maps of this paper. Also, Turkey was embraced as candidate member of the European Union.

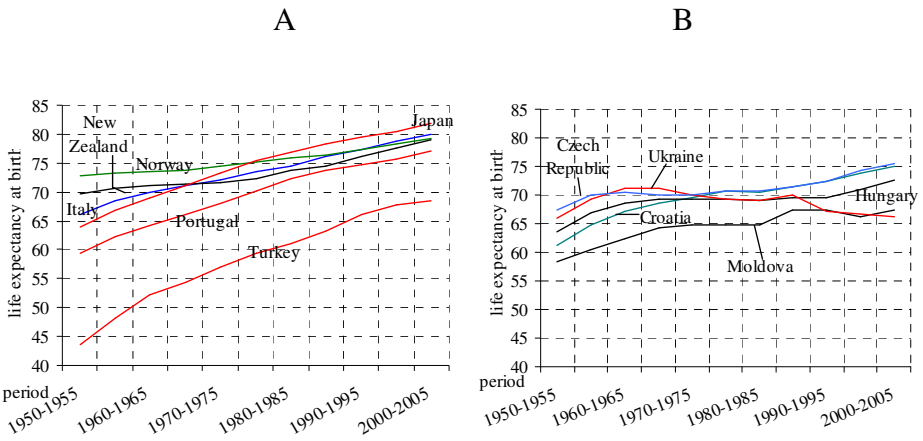


Figure 5: Life expectancy at birth in selected countries. Source: UN (2006a)

Consequently, considering life expectancy at birth, two major trends are observed in the, so called, developed world (Figure 5). The first deals with the unidirectional decrease of mortality levels at various transitional paces and chronological onsets, which results in a constant elevation and a gradual convergence of life expectancy at birth (Figure 5A). The second refers to the mortality transitions in the countries of the Eastern Europe, where mainly, and despite the original improvements, a slow down of the rhythm of mortality decrease was observed from the late 1960s (Figure 5B). After the 1990s, these countries followed a diverged course in which, in the ex-Soviet Union democracies of Russia, Ukraine and Belarus, life expectancy at birth shortened until 2000-2005, while in the others, more moderate improvements were observed.

Three main questions remain to be answered concerning this mortality transition. The first deals with the cause composition of mortality during it, the second with the causa causans of it and the third with the question of its possible global fit.

According to Omran (1971), in the course of mortality transition, pandemics and infections were gradually displaced by degenerative and man-made diseases as the basic form of morbidity and primary causes of death. Following the *'Age of Pestilence and Famine',* the *"Age of Receding Pandemics"* is characterized by the accelerated rate of mortality decline, because the pandemics became infrequent or disappeared. At that stage, life expectancy at birth from, more or less, 30 years increased to about 50. Then, in *'the age of degenerative and Man-Made Diseases',* i.e. diseases like malignant neoplasms, cardiovascular diseases, hypertension, diabetes mellitus, or diseases linked to the side effects of modernization (alcoholism, smoking, car accidents; Caselli et al., 2002), mortality continued to decline and the average life expectancy rose up to more than 50 years.

Typifying the observed variations of demographic transition of the western countries, Omran (1971) proposes the *'classical or western model'* to validate for the gradual and progressive transition from a high pressure demographic regime of high mortality (above 30 per 1000 population) and high fertility (above 40 per 1000 population) to a new one, where mortality and fertility are low (less than 10 per 1000 and 20 per 1000 respectively). However, for transitions like those observed in Japan, Eastern Europe, and the countries of former U.S.S.R., the *'accelerated model'* was proposed (Omran, 1983), differing from the previous one on its greater pace and its faster shift to the age of man-made and degenerative diseases (Omran, 1971).

Omran's theory reflects the, by the 1970s, general well spread notion that mortality had declined by this time at its minimum limits. Specifically, male mortality rates seem to have stabilized during the 1950s and 1960s as a result of the cardiovascular disease "epidemics" (Olshansky and Ault, 1986), and this was thought to be a serious evidence that actually life expectancy would convert to a maximum point of universal convergence around the 70 years (Vallin and Meslé, 2004). However, male mortality started to decline later on, mainly because of the, partial, control of the man made diseases but also because of the medical achievements in the fight of cardiovascular diseases (Vallin and Meslé, 2004). That's why several extensions of the three stages model were added. Olshansky and Ault (1986) recognized a new stage in the epidemiological transition, the *'age of delayed and degenerative death'* in which, although cause composition of mortality, on the one hand, remained largely stable, mortality itself, on the other hand, shifted to older ages, exceeding 80 years at the end of the stage (see also Salomon and Murray, 2002). In older adults the cause composition of mortality remained stable but deaths shifted to older ages. Rodgers and Hackenberg (1987) also recognized a fourth stage of mortality transition, called 'hybristic', in which destructive lifestyle, personal attitudes and man-made diseases affect morbidity and mortality. At that stage, even though a general eradication of infectious diseases is observed, some like HIV/AIDS spread out because of behavioural or other but man-made causes. Robine (2001) challenged the historical reality and uniqueness of Omran's last two stages transition, proposing that they should be merged to form a new stage called the 'age of the conquest of the extent of life'. Later on, Olshansky et al. (1997) added a fifth stage, called the 'age of emergent and re-emergent infections', in order to describe the recently elevated importance of re-emerging or newly emerging infectious and parasitic diseases, like AIDS, tuberculosis etc., to mortality levels. In the matter of fact, it has been proposed that during mortality transition in Europe, the spatial variability of the importance of infectious diseases has risen, while it was countered by a spatial convergence in the importance of the diseases that typify late transition (Smallman-Raynor and Phillips, 1999).

Today, according to the 2003 report on the Social Situation in 15 European Union members (European Commission 2003a; see also European Commission, 2003b), the most common causes of death were the diseases of the circulatory system (42% of all deaths in 1998), cancer (29% for men and 23% for women), diseases of the respiratory system (9%), digestive diseases and external causes of injury and poisoning. Infectious and parasitic diseases represented less than the 2% of causes of death. Some infectious diseases like viral hepatitis have gained much importance lately.

Nevertheless, epidemiological transition theory ignores the inter-sex and inter-racial group variations in mortality (See Salomon and Murray, 2002 for a summary). Also, according to Frenk et al. (1989), because the evolutionary changes in the patterns of morbidity and mortality are actually reversible, then *'counter transition'* is evident. In some countries, different types of disease co-exist and this is called *'protracted epidemiological transition'* which often leads to *'epidemiological polarization'*. The last situation reflects the health inequalities among social classes, which hitherto were predominantly quantitative and they become qualitative with this polarization. The poorer sectors of the population present high rates of disease, but also of different kinds, mostly either infections or nutritional disorders (Frenk et al., 1989).

Several examples of the counter transition refer to the increase of age specific mortality of males aged 35 and over in France between 1850 and 1950, and the HIV pandemics in Africa (Salomon and Murray, 2002). Additionally, many African countries, where the second phase of epidemiological transition has not been completed, are hardly afflicted with new epidemics like AIDS (Caselli et al., 2002). In Eastern Europe mortality transition, as it has been noticed above, has slackened out or been reversed recently. These facts indicate that transitional stages are not sequential and mortality changes are not all the time unidirectional.

The differential course of general mortality in the countries of Eastern Europe after 1970 is ascribed to their weakness to confront circulatory and respiratory diseases and, secondarily, alcoholism, but also to the development of new strategies in the western countries in order for the average life span to be increased (Kotzamanis, 2000). Also, violent deaths and infectious mortality, for example AIDS and tuberculosis, played an important role in the former U.S.S.R democracies, along with the social and economic traumas which were caused by the rapid transition to the market economy. On the contrary, life expectancy gains that are observed in Czech Republic, Slovakia, Poland and Hungary are connected with the decrease of mortality from circulatory diseases but also can be attributed to other factors such as changes in diets or the growth of systematic prevention and screening (Meslé, 2004).

According to the classical theory, the epidemiological transition accompanies the modernization, or is it the westernisation (?), and economic development of most of the European countries. Conclusively, it is a unidirectional and more or less deterministic process, based on socio-economic developments and, in the case of Europe, on eco-biologic factors (Omran, 1971). But if the deterministic course is acceptable, then the modernization of the societies would lead to the gradual convergence of mortality levels globally. However, the divergence that was observed in the former U.S.S.R Democracies invalidates this proposition, indicating a more complex pattern of transition.

Surely, one of the crucial factors of the transition refers to the medical interventions. According to Omran (1971), the role of medical factors as an ultimate cause of transition was less important until the 20th century, when they became more direct and salient, especially after the spread of antibiotics by the 1930s (McKeown, 1976). By the end of the 18th century several advances had been achieved in agriculture, health status but also in medical science with the discovery of small pox vaccines. In the last third of the 19th century several pathogens have been identified and new vaccines and serums served in the prevention and treatment of the principal infectious diseases. After World War I, medical advances have extended considerably and health education has diffused significantly in the Western European populations. Lastly, the discovery of antibiotics and their extended use in the fight of infectious diseases mainly after World War II, served in mortality transition (Chesnais, 2001). Further developments in the medical technology, as well as reductions in the risk factors for degenerative diseases, served the transition (Olshansky and Ault, 1986)**.**

The role of public interventions is also recognized, as, for example, the construction of water supply and drainage systems and the general improvement of sanitary conditions (Razzell, 1974; Preston και van De Walle, 1978; Olshansky and Ault, 1986), as well as the development of a political and ideological movement concerning public health (Szreter, 1988). Nevertheless, several societal and behavioural influences, like the educational level of the mother, are among the determinants of mortality transition (Caldwell, 1979)**.**

The "wealth flow" theory, based on behavioural, cultural and actually economic grounds, focuses on the role of the children in the agricultural productive unit which coincided with the family unit in the pre-transitional era, where children were used for the maximization of productive conditions and the stability of the unit without paying attention to their health status (Caldwell, 1982, see also Caldwell, 2005 for an update). With the establishment of the contemporary individual and secular society, the importance of children care was recognized and that led to the improvement of their survival capabilities (Simons, 1989). However, evidence from traditional societies does not support this approach, as it was found that parents desire children despite their economic cost or their economic importance (see Kaplan 1994; Alvard, 2003).

In a broader view, Chesnais (2001) recognized that health and socio-economic development are closely related and interdependent in the complex network that determined the cause of decline. Among them the socio-medical programmes, the medical infrastructure, biomedical resources and equipment, ecological conditions etc. are included. Actually, Omran's theory has been attacked 'as being insufficiently epidemiological in that its focus was the changing causes of death rather than the changing patterns of illness" (Caldwell, 2001, p. 160), a condensing view of the, by then, well developed and broader notion of 'health transition'. Frenk et al (1991) first introduced this term, in order to describe mortality temporal changes in such a way so as to include not only the epidemiological characteristics of health but also the societal responses to health situation and vice versa (Vallin and Meslé, 2004). Health transition focuses on the cultural, social and behavioural determinants of health, others than medical interventions and income, like education, housing and wider public health interventions (see Smallman-Raynor and Phillips, 1999 for a small review). In that prism, Vallin and Meslé (2004) propose that Omran's epidemiological transition may reflect the first stage of global health transition which 'develops into several stages depending on different major changes in health strategies' (p. 37). Then, the next stages of transition would be the 'cardiovascular revolution' and the 'fight against ageing' (Vallin and Meslé, 2004).

d2. Africa

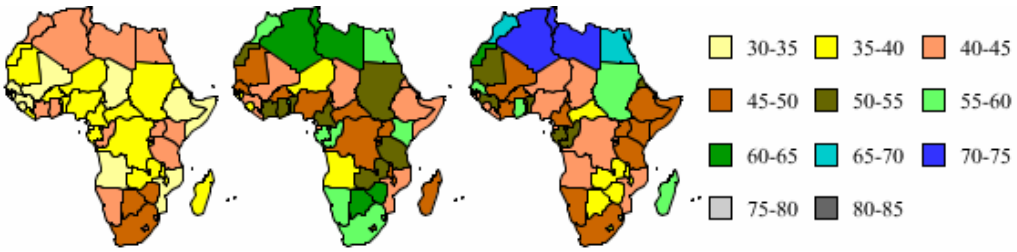


Figure 6: Life expectancy at birth (e_0) in African countries. Selected periods. WE= Western Europe. Data source: UN (2006a).

By the 1950s, life expectancy at birth was higher in the Northern and Southern Africa and some other sub-Saharan regions, ranging between 40 and 50 years, that is the 60-70% of Western Europe's average (Figure 6). All the other African areas were located bellow the 40 years. Thirty years later, despite the general mortality decrease, the countries with the highest life expectancy at birth in 1950-1955 had reached only the 70% of Western Europe's average, while the rest were still under the 60%. In 2000-2005, Northern Africa, which further converged with Western Europe, was clearly distinguishable from Sub-Saharan

Africa. There, transition either slowed down (Figure 7, pattern III) or reversed (Figure 7, pattern V) from 1980-1985 up to 2000-2005, and in some countries mortality actually increased.

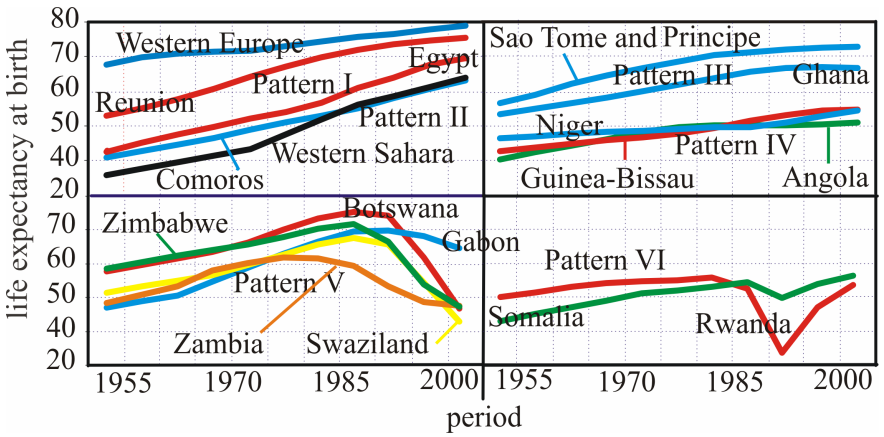


Figure 7: Mortality trends in various African countries. Data source: UN (2006a).

In other countries, the gains of life expectancy at birth were minimal throughout the post-war period (Figure 7, Pattern IV). On the other hand, islanding Reunion and Egypt are the upper and lower limits of a group of countries, in which, along with the other Northern African ones, a significant and continuous elevation of life expectancy at birth is being observed up to now (Figure 7, pattern I). Comoros and Western Africa follow the same trend, but in lower levels, of continued increase in the survival (Figure 7, pattern II).

As Vallin and Meslé (2004) note, Africa is an exception in the epidemiological transition. The re-emergence of infectious diseases and AIDS pandemics afflict many African countries which they have not completed the second stage of epidemiological transition yet (Caselli et al., 2002). As a matter of fact a protracted bipolar transition has been observed there, in which, as is the case in South Africa, the diseases of 'poverty' and emerging chronic diseases co-exist (Bradshaw et al., 2002). In that way, the protracted double burden of diseases exists, consisting of infectious diseases (accounting for the 28% of years lives lost in South Africa for example) and non-communicable diseases (which account for the 25%; Kengne et al., 2005).

Mortality transition in Africa must be attributed to the special economic, social, cultural and ecological characteristics of the continent. Politically, several attempts of democratisation are observed in many African countries and the upholding of civil rights and liberties has improved (Wegner and Lecomte, 2006), but at the same time tension, instability, and democratic abolitions often characterize the African political life. Wars and armed conflicts are included in

Sub-Saharan Africa's historical times, as is the case with the recent revival of hostilities between Eritrea and Ethiopia, or the genocide of Tutsis in Rwanda (see Verwimp, 2005), which caused the sharp elevation of mortality by 1994 (Figure 7, pattern VI). Nevertheless, life expectancy resumed its long term trend after the crisis, as it is usually the case, but sometimes the recovery is less clear because conflicts are protracted or followed by economic and social problems (Vallin and Meslé, 2004). In other cases, international aid, as it happened, for example, in Ovamboland (Namibia), would positively affect survival (Notkola et al., 2000). But usually food shortages, impoverishment, forced removals and drought result in severe elevation of mortality and migration, as it happened in Zimbabwe (UNAIDS/WHO, 2006) or in Ethiopia (Ezra, 2001). Then, the collapse of the health care system after the 1980s, political inefficiency and corruption, insufficient development of the water supply and sewage system are some of the reasons that surcharge mortality levels (Commission for Africa, March 2005).

Economically, sub-Saharan Africa is one of the most underdeveloped areas of the world. The slow down of mortality transition by the 1980s is attributed to the economic recession which followed the world economic crisis of the 1970s (Vallin and Meslé, 2004). Today, despite the vast economic growth[6], the 44% of the sub-Saharan residents live with less than 1$ per day, and although the poverty rate declined marginally recently (from 33% to 31% between 1990-1992 and 2001-2003), the number of people living in extreme poverty increased by 140 million (UN, 2006b). The problem is intensified because of the rapid urbanization, and especially of the rapid growth of the slum areas of the cities (annual growth 4.5% in 1990-2001), resulting in a very high urban poverty (ranging from 10% of the female population in Ghana and Namibia up to 72% in Chad; Magadi et al., 2003).

Social and economic differences and inequalities are characteristically impressed in the differential accessibility to the educational systems between different socio-economic strata or people from different countries, indicating the polarized mortality transition. Severe health care system failures and illiteracy result in the elevation of children mortality (Kapungwe, 2005). The educational level of the mothers is generally very low, and this is connected with the elevated mortality risk of the children because of the weakness of clear perception, confronting illness and treatment of the people and also because of the insufficient immunization of the children[7]. Furthermore, it is a usual

[6] 5.6% in 2005 and 4.8% in 2006 (International Monetary Fund, 2005), comparing with 2.8% of the European Union (European Commission, 2006).

[7] The 64% of the children attend primary school but this is the case for fewer than half of them in countries like Mali, Ethiopia, and Niger. Only the 65% of children aged 12-23 months is immunized against measles. In countries like Chad and Nigeria children of educated mothers are two to almost four times, respectively, more likely to be vaccinated than children of mothers with no education (UN, 2006b).

phenomenon some diseases to be attributed to spiritual actions disregarding the proper medical treatment (Ogunjuyibge, 2004).

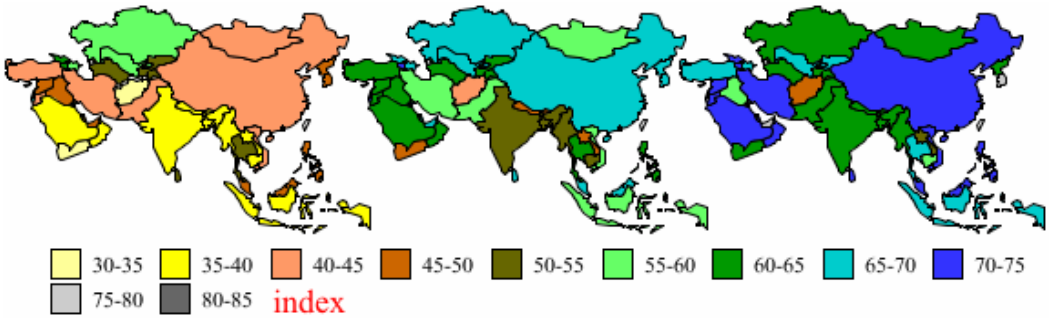
At the same time, maternal mortality remains high because of the inadequate health care system[8] and antenatal care is infrequent or starts, if at all, later during pregnancy. That's because the poverty and low socio-economic status lead to the underutilization of the existing health services by the urban residents of sub-Saharan Africa (Magadi et al., 2003). In other cases, the role of social networks is recognized, as is the case with the AIDS pandemic in Africa (Buehler and Kohler, 2003), connoting at the same time the importance of education in combating the diseases.

The re-emergence of infectious and parasitic diseases is an important problem. Tuberculosis epidemic is rising by 4% a year, while more than 400 million episodes of Malaria are taking place each year in Africa (Commission for Africa, March 2005). HIV pandemics are the central problem. Even if United Nation data is disputed for methodological reasons (Grassly et al., 2004), it seems that almost 25 million people are living with HIV in sub-Saharan Africa – 63% of all persons with HIV globally (UNAIDS/WHO, 2006). Southern Africa remains the epicentre of the HIV epidemic. A general trend of stabilizing or declining HIV prevalence is observed in East Africa, while in the West and Central prevalence continues to be much lower (UNAIDS/WHO, 2006).

In one respect, the introduction of prevention programmes including social marketing, voluntary counselling and testing, prevention of mother-to-child transmission and improved treatment for sexually transmitted diseases are unlikely to lead to short-term decrease of AIDS mortality. More immediate results would arise from antiretroviral treatment (Johnson and Dorrigton, 2006). Provision of antiretroviral therapy has expanded in sub-Saharan Africa and more than one million people were receiving antiretroviral treatment by June 2006 (UNAIDS/WHO, 2006), but the cost is extremely high. According to Bachmann (2006), providing early triple antiretroviral therapy (ARV) plus antibiotics to the 4.7 million people, which are estimated that have been affected only in South Africa, throughout their lives, will cost 98 billion US$. Other practical solutions, like giving late antiretroviral therapy (ARV) and antibiotics only to the patients with clinical AIDS would enormously reduce the cost, but at the same time international aid is necessary along with other investments in health.

[8] Only 46% of deliveries were attended by skilled health care personnel (UN, 2006b)

d3. Asia



1950-1955	1980-1985	2000-2005
Western's Europe e_0=67.6	Western's Europe e_0=74.3	Western's Europe e_0=78.9

Figure 8: Life expectancy at birth (e_0) in Asia. Selected periods. Data source: UN (2006a).

Table 1: Differences in life expectancy at birth between selected periods. All Asian Countries. Data Source: UN (2006a).

	Difference between 1950-1955 and 1980-1985				Difference between 1980-1985 and 2000-2005			
Area	Min	Max	Range	Median	Min	Max	Range	Median
Eastern	13	25.8	12.8	17.4	-3.4	9.6	13	6
South Central	9.7	18.2	8.5	12.1	-2.6	16.9	19.5	6.1
South Eastern	8	19.5	11.5	12.9	3.9	11.3	5.5	7.1
Western	7	25.1	18.1	17.1	-3.2	11.3	14.5	5.6

Asia, by the 1950s was a continent of strong inequalities concerning mortality[9] (Figure 8). Minimum life expectancy at birth was 30 years in Timor Leste and around 32 in Afghanistan and Yemen, less than a half of Western' European average. At the other edge, in some of the former USSR democracies and countries like Israel and Hong Kong mortality transition had moved well ahead.

[9] Russia Federation and Japan were omitted because they have been discussed previously. Turkey is included for interpretation reasons.

Thirty years later mortality had been reduced in all the countries of the Asian continent. In comparison with 1950-1955, life expectancy's gains ranged from +10-20% in ex-Soviet Union Democracies up to more than +60% in China and Oman. As a result, the gap with Western Europe had narrowed significantly in many countries, reaching the 80-90% of life expectancy at birth, while in others, like India and Pakistan remained beneath 70%, or even well below like Afghanistan. By 2000-2005, Israel, China, Korea, Singapore and some countries of the Arab peninsula have by far converged with Western Europe, while others like Afghanistan, Cambodia, Laos and Iraq represent the other opposite, exhibiting a difference of more than 20 years.

Nevertheless, two important observations concerning mortality decline during the post war period can be noted (Table 1). The first refers to the rapid improvement of life expectancy at birth in the 30 years period following 1950-1955 and the slackening of this trend thereafter. The second deals with the inversion of the transition between 1980-1985 and 2000-2005 in North Korea, Kazakhstan and Iraq.

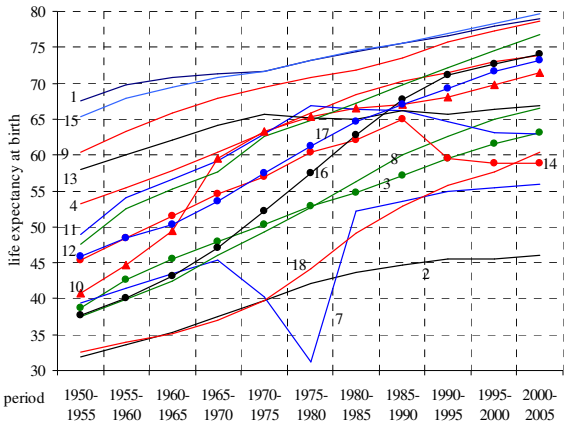


Figure 9: Life expectancy at birth (e_0) in selected Asian countries. Data source: UN (2006a). Index of countries: 1: Western Europe, 2: Afghanistan, 3: India, 4: Sri Lanka, 5: Tajikistan, 6: Uzbekistan, 7: Cambodia, 8: Indonesia, 9: Singapore, 10: China, 11: North Korea, 12: South Korea, 13: Azerbaijan, 14: Iraq, 15: Israel, 16: Oman, 17: Syria, 18: Yemen.

In figure 9, a picture of the complex Asian mortality transition is clearly shown. Israel soon enough coincides with Western Europe's average, showing a more moderate transition, as is the case with Singapore. At the other edge, Afghanistan (2) is clearly distinguishable from the other Asian countries because of the relatively weak transition and the high mortality levels. Other countries show a variety of rhythms of temporal mortality changes. Yemen (18) and Oman (16) exhibit the fastest transitions in Asia, where life expectancy at birth almost doubled in a 50 years period, followed by countries like Indonesia (8), Syria (17), India (3) and Sri Lanka (4). Several others, like Cambodia (7), Iraq (14), and Afghanistan (2), are noticed for the effect of civil and international wars. In

ex-Soviet Union Democracies (5, 6) of the area, mortality transitions are decelerated after the 1980s.

On the contrary, signs of strong convergence at very high levels of life expectancy are observed[10] in Eastern Asia. As Zhao and Kinfu (2005) summarize, by 1900-1920, life expectancy in Taiwan was below or around 30 years, or even lower. The original Japan's trend of mortality decline, which was described above, was followed by a quicker and earlier transition in Taiwan and later on in Korea (12), two countries with comparable socio-economic situation. At the beginning of the 1930s, life expectancy at birth in both populations was more than 35 years and further increased to about 45 years in Taiwan in the early 1940s, and approached this level in Korea at the end of the Second World War. Mortality transition in Hong Kong must have started by the beginning of the 20th century. In historical China there is a mixed picture of mortality levels. Between 1889 and 1909 it varied between 30 and 40 years, or in some populations even lower than 30 years. Around 1930, life expectancy at birth was estimated at less than 25 years, because of war and social conflicts, and was probably lower than 35 years between the 1930s and the 1940s (Zhao and Kinfu, 2005). In China (10) transition was accelerated from 1950-1955 up to 1965-1970, when life expectancy at birth improved by 20 years. A more moderate transition was observed by then, but at 2000-2005, China was 5-10 years behind the other countries of the area.

According to Omran (1971), '*the contemporary or delayed model'* is followed during the epidemiological transition in developing countries, because the recession of infectious diseases is relatively recent and determined by the intromission of medical technology, such as the mass use of chemotherapeutic agents, antibiotics and insecticides, but also through mass public health programmes like the World Health Organization malaria eradication ones, maternal and child health programmes and nutritional improvement programmes (Omran, 1983). 'Ceylon', nowadays Sri Lanka, was originally considered to be a paradigm of this transition (Omran, 1971; Figure 9, country 4), in which mortality decline was delayed even up to the fifth decade of the 20th century, when it was accelerated. But later on, the transition has slackened off because of the limits that were put up by the medical care system, and the level of socio-economic development (Omran, 1983). Later on (Omran, 1983), Sri Lanka, along with other countries like South Korea (Figure 9, country 12), Singapore (9), Taiwan and probably China (10) were considered to follow *'the transitional variant of the delayed model'*, where the transition did not slacken as much as it happened in those following the *'delayed model'* (Omran, 1983)**.**

[10] Greater differences, compared with the other countries of Eastern Asia, are observed in Mongolia and North Korea (Figure 9, country 11), where mortality transition was inversed after the 1990s.

However, the protracted polarized model of mortality transition seems to be evident in many of the Asian countries. In India (3), for example, mortality decline is quite sharp, but there is also a strong evidence of the existence of a double burden of disease, in which diseases like diabetes and coronary diseases are very well spread in the population along with infectious diseases like pneumonia, diarrhea and malaria (Yach et al., 2004). In Kerala, India, (see Dilip, 2002), the burden of ill health was higher in urban than in rural areas, while large-scale inequalities in health access were evident among the different socio-economic strata. In South Asia the disease burden of infectious diseases includes high incidents of acute respiratory infections and diarrhoea, which account for children mortality, HIV/AIDS and tuberculosis, malaria, typhoid fever, dengue and hepatitis. According to another opinion, the mixed picture of epidemiological transition from infectious to degenerative diseases is evident, indicating that the area is at early stages of epidemiological transition (Zaidi et al., 2004), despite the fact that mortality has been reduced enough. The protracted polarized model is also attributable to the former Soviet Union democracies of Central Asia, which are probably in a different transitional stage than the other former Soviet states. Nowadays, infant and child mortality are high and they face problems similar to that of the poor countries (Veenema, 2000). Despite the shift from communicable to degenerative diseases that was, by the 1990s, observed in the socio-economically diverse countries of Middle East (Omran and Roudi, 1993), a contemporary mixed picture of transition is observed: the 40% of the deaths are caused by communicable diseases, the 45% by non-communicable and the 15% by injuries (Jabbour, 2003). Indonesia is also in the midst of an epidemiological transition in which non-communicable diseases are increasingly important, while infectious and parasitic diseases remain a significant part of the disease burden. Available evidence on causes of death in East Asian populations indicates similar shifts as their life expectancies improved. By the 1950s deaths due to infectious and parasitic diseases accounted for some 21 per cent of deaths in Hong Kong, about 17 per cent in Taiwan and nearly 9 per cent in Japan (Ueda, 1983, cit. Zhao and Kinfu, 2005). By 2001, 58-60% of the deaths in Hong Kong and Japan and 45-49% in South Korea and Taiwan were caused by cancer, stroke and degenerative diseases. Similar trends are observed in China (Zhao and Kinfu, 2005).

Table 2: AIDS epidemic in Asia . Source: UNAIDS/WHO (2006).

	Adults and Children Living with HIV		Adults and Children newly infected with HIV		Percentage of Change in newly infected people between 2004 and 2006	Adult prevalence in 2006 (%)
Region/ Year	2004	2006	2004	2006		
Middle East and North Africa	400,000	460,000	59,000	68,000	15%	0.2
South and South-East Asia	7,200,000	7,800,000	770,000	860,000	12%	0.6
East Asia	620,000	750,000	90,000	100,000	10%	0.1
Eastern Europe and Central Asia	1,400,000	1,700,000	160,000	270,000	70%	0.9

Nevertheless, AIDS epidemic is an important threat to Asia but not such as it is in Africa (Table 3). According to the UNAIDS/WHO report in 2006, South and South-East Asia along with Eastern Europe and Central Asia, where newly infected people have increased by 70% between 2004 and 2006, face the most severe problem. In Uzbekistan, which straddles major drug-trafficking routes, the number of reported HIV cases has more than doubled, and in Tajikistan they have risen fourfold since 2001. In South-East Asia, several risk behaviours, such as combinations of unprotected paid sex, homosexual intercourses, non-sterilized injection instruments for drug users, are sustaining the epidemics. Sometimes people who believe themselves to be at low risk are infected: in Thailand about one third of new infections in 2005 were in married women who were probably infected by their spouses. This is also the case is India. In Pakistan and Afghanistan, HIV outbreaks are found in some of the most at risk populations, where several widespread risk behaviours will probably lead to HIV epidemic growth. In Japan 17,000 are HIV positive, and homosexual intercourses account for the 60% of annual reported HIV infections. In China, where HIV/AIDS epidemic is currently emerging, starting unexpectedly from the rural areas, two major types of transmission are involved. The first is

connected with drug users and the second with unprotected heterosexual (Merli et al, 2006) and homosexual intercourses (UNAIDS/WHO, 2006), as is also the case in Cambodia, China, India, Nepal, Pakistan, Thailand and Viet Nam. In Middle East, it is very difficult to have accurate estimations of HIV epidemic trends because of the inadequate surveys. It seems that the prevalence of HIV increases, though AIDS epidemics in the region are diverse. Nevertheless, it seems that health system's failures and inequalities lead to the insufficient medical coverage of the HIV positive people. In Asia, despite the general improvement of the number of people who take antiretroviral treatment, still only the 16% of the needs is covered, with the exception of Thailand where more than 50% of people are under therapeutic treatment (UNAIDS/WHO, 2006).

It is obvious that mortality transition took place at various paces and had different chronological onset in the Asian countries. Different political regimes, socio-economic, cultural and ecological variables are responsible for the formation of the different environments in which transition took place, and also for shaping current mortality patterns. The highest mortality is found in the poorer countries and those that have been afflicted by civil or international wars (Caldwell and Caldwell, 2006). Nevertheless, economic development resulted in the decline of extreme poverty and hunger[11] (UN, 2006b), but serious mortality differentials still exist between rural and urban areas, as well as between the slum areas of the cities and the richer ones (see Caldwell and Caldwell, 2006).

Income, as it has been proposed, is correlated negatively with mortality levels. Probably, that is one of the reasons why Hong Kong and Singapore are among the countries that enjoy the highest life expectancies. Nevertheless, in the former USSR democracies of Tajikistan, Georgia, Azerbaijan, Kyrgyzstan and Armenia life expectancies are higher than they would be expected according to their GDP per capita in 2002, while in Kazakhstan, Uzbekistan, and Turkmenistan it is the opposite (Caldwell and Caldwell, 2006). This fact indicates that other parameters like the educational level and public health services intervene controlling the mortality levels of a population. Nevertheless, the political reformation in the former USSR states of Central Asia resulted in the economic destabilization, the spread of poverty and the collapse of the public health system, which, along with severe environmental problems, have aggravated the health status of these populations (Veenema, 2000). On the contrary, the partial reformation of the political system in China had more moderate impacts on population health. The abandonment of collective agriculture resulted in the

[11] The huge economic development in Eastern Asia resulted in the decrease of extreme poverty from 33% in 1990 to 14.1 in 2002. In South-Eastern and Western Asia it is even lower. But in Southern Asia the 31.2% of the population lives in extreme poverty. By 2001-2003 the 21% of the population in Southern Asia lives in hunger while, it is the 12% in Eastern, the 12% in South-Eastern and the 9% in Western.

severe decline of absolute poverty (33% in 1978 comparing with 12% in 1985) and hunger, malnutrition and nutrient deficiencies have diminished, though greater improvement is needed (Short and Zhang, 2004). After the political reform, the weakening of the health system was counterbalanced by the huge economic development and thus mortality continued to decline (Banister and Hill, 2004). In the second biggest country of the world, India, the great variability of mortality trends is attributed to the different levels of socio-economic development, which on its turn correlates negatively with infant and child mortality (Amonker and Brinker, 1997). Recent reports from the Arab World (United Nations Development Programme, Arab Fund for Economic and Social Development 2002 and 2003; Jabbour, 2003) refer to problems of illiteracy, lack of job opportunities, slow economic growth and low productivity, lack of innovation and competitiveness and serious developmental gaps related to the distribution of the oil wealth. According to this point of view, there is a tendency towards to curative rather than preventive care, weak public health institutions, variable quality of health care, lack of capacity for policy making and unresponsive and inequitable health systems. One of the major problems is considered to be political and military conflicts and the conservative political systems.

According to the latest available data of United Nations (2006b), the mortality of the children aged less than 5 years is 126 deaths per one thousand births in Southern Asia, 78 in South-Eastern Asia, and 48 in Eastern. Maternal and infant mortality have remained a problem throughout Middle East with the exception of Israel and some of the Gulf States, while malnutrition and wide disparities between rural and urban areas and different countries exist (Jabbour, 2003). Medical treatment and facilities and poverty, vaccination of the children[12] and literacy are important determinants of early mortality (Jain, 1985). State interventions then are of great importance in the fight of the diseases, irrespective of the political, social, cultural or economic system. In China, for example, before the political reform of the late 1970s, the public health campaigns and the socialized health services resulted in the rapid decline of the mortality of the children aged less than 5 years (Banister and Hill, 2004). Furthermore, after the political reformation, several improvements were observed in vaccinating children, in the effort to diminish illiteracy and in the expansion of health facilities and despite the partial privatisation of public health, mortality transition, eventhough it had slackened off, continued to proceed. Additionally, the fall of infant mortality in all the Arab countries, except Iraq, between 1978 and 1998 was interpreted to be inversely related to the literacy status of the parents, the annual gross national product per capita and

[12] Only the 62% of children is immunized against measles in Southern Asia, compared with the 81% in South-Eastern, the 85% in Eastern and 88% in the Western (UN, 2006b).

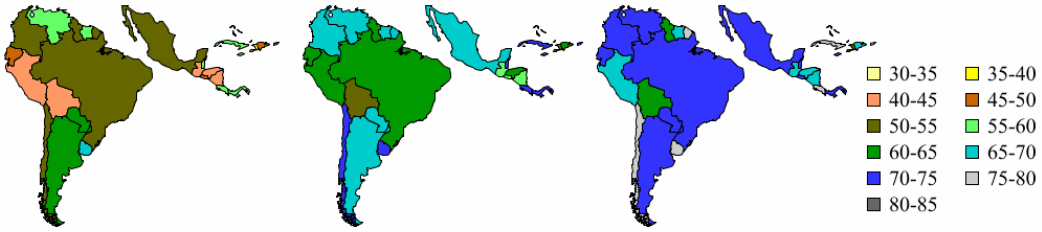
to the improvement of water supply and sanitation infrastructure (Shawky, 2001).

Therefore education[13] of the people is considered to be essential, not only because of its role as one of the determinants of children and infant mortality, as it has, for example, been found in China (Bannister and Hill, 2004), in India (Kravdal, 2004) and elsewhere, but also as a tool for the transformation and the gradual abandonment of cultural practices that aggravate the health status of the people. Of course, an ethical issue has to be taken into consideration, concerning the way and the validity of intervention in cultural systems and the avoidance of sovereign practices, especially those which may lead to a possible forced westernisation of the societies, but it seems that socio-cultural, political and economic agents determine the discrimination against girls. This is the case in Middle East (Yount, 2001) and Southern Asia, where the economic mobility and the rearing of a son are thought to be close connected (Cain, 1986). It is the preference for the sons which led to the excess infant mortality of the girls in Southern Asia (Caldwell and Caldwell, 2006). In China this phenomenon was accompanied, and probably intensified, by the one-child policy of the government (Bannister and Hill, 2004). Nowadays, because medical technology permits foetus sex identification, intentional abortions of the female foetuses have increased, especially in Northern India and South Korea (Caldwell and Caldwell, 2006). It is then obvious that education will considerably attribute not only to the elimination of the gap in child mortality of the two sexes (Bourne and Walker, 1991), but also to the elimination of preferential treatment practices. Moreover, females tend to exhibit higher reproductive mortality because of the inadequate assistance during pregnancy and before and after birth[14], but also in some Muslim countries, because of gender inequalities. Nevertheless, the family planning programmes are evaluated for the, for the time being, small improvement of the situation (Caldwell and Caldwell, 2006). For example, recently in China maternal health was improved with the use of maternity services, in consistency with the politics of integration of reproductive health into family (Short and Zhang, 2004). Despite the fact that maternal mortality rates vary from less than 10 deaths per 100,000 live births in Singapore and Japan up to more than 500 in Nepal and India, the low rates that are observed in lower middle economies such us Thailand and Malaysia suggest (36 and 30 respectively) that maternal mortality can be reduced, often with simple interventions, as Hussain et al. (2006) point out.

[13] More than the 83% of the children in Asia attend primary school. The majority of them are boys because of the existing gender inequalities (UN, 2006b).

[14] According to UN Data (UN, 2006b) only the 36% of deliveries is attended by skilled health care personnel in Southern Asia, in comparison with the 66% in Western Asia , the 68% in South-Eastern Asia and 79% in Eastern.

d4. Latin America and the Caribbean



1950-1955 1980-1985 2000-2005 index

Figure 10: Life expectancy at birth (e_0) in Latin America and the Caribbean. Selected periods. Data source: UN (2006a).

Table 3: Differences in life expectancy at birth between selected periods. Latin America and the Carribean. Data Source: UN (2006a).

	Difference between 1950-1955 and 1980-1985				Difference between 1980-1985 and 2000-2005			
Area	Min	Max	Range	Median	Min	Max	Range	Median
Caribbean	8.2	17.1	8.9	14.2	-0.5	6.5	7	2.3
Central America	11.3	19	7.7	16.1	0.7	14.1	13.4	7.1
South America	4.5	17.5	13	13.5	1.9	10	8.10	5.7

In 1950-1955 Latin America and the Caribbean constituted a diversiform world (Figure 10). In countries like Peru and Bolivia life expectancy at birth was less than 45 years, while in others like Argentina and Paraguay, it had exceeded 60 years. Nevertheless, all the countries of the area were far away from the Western European average of the era (67.6 years). Thirty years, at rates varying from below 10% up to 30-40%, life expectancy at birth has been improved considerably, while Uruguay and Chile are very close to European average. In 2000-2005, when the Western Europe's average was 78.9 years, in the majority of the countries, people were expected to live more than 70 years. In Chile, Uruguay, Martinique and Guadeloupe, life expectancy had exceeded 75 years, while some others, like Bolivia and Guyana, represented the other edge, especially Haiti, where life expectancy at birth remained under 50 years.

As usual, transition decelerates from 1980-1985 up to 2000-2005, in comparison with the previous period (Table 3). Nevertheless, Table 3 indicates a mixed picture of transition in both periods under consideration.

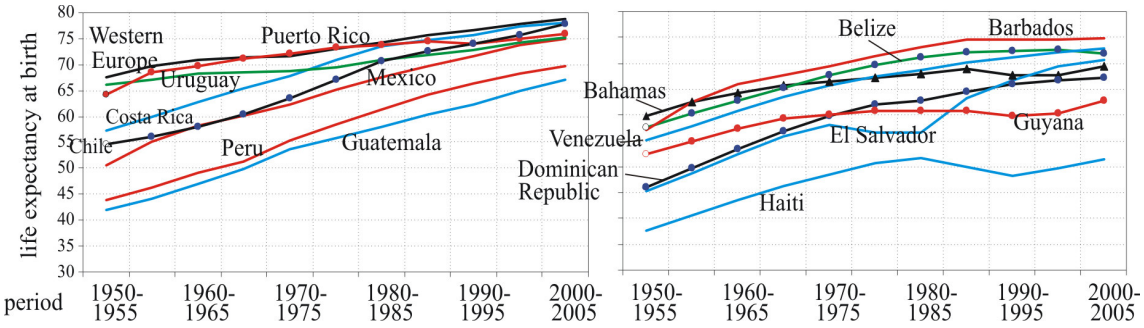


Figure 11: Life expectancy at birth (e_0) in Latin America and the Caribbean.

Several major trends in mortality temporal changes are observed in Latin America and the Caribbean. In countries like Uruguay and Puerto Rico transition is very slow (Figure 11) as is also the case in many Caribbean countries. In others, like Costa Rica, Mexico, Chile, Peru and Guatemala, transition is steep and continuous. In Barbados, Belize and several other countries on the right side of figure 11, life expectancy's gains are minimal after the 1980s, while Bahamas, Guyana, Salvador and Haiti exhibit more unique trends.

America is an excellent paradigm of an area where large economic, social and demographic disparities and a double burden of disease are evident. These concern limited access to health systems and differential standards of living, large gaps in income distribution and social inequalities. Inequalities in the distribution of resources correlate with inequalities in the risk of becoming ill (Castillo-Salgado, 2000). Frenk et al. (1989) first introduced the term *'protracted epidemiologic transition'* and *'epidemiologic polarization'* in order to describe mortality and cause of death differentials and trends in countries with low middle economy such as Mexico. There, by 1981, the insured population, comprised mainly of manual workers in the analysis, benefited a lot from the social health care system and showed a mixed pattern of diseases, in which non-communicable diseases co-existed with infectious ones. On the other hand, people from the rural areas, most of them not entitled to the social security system or having limited access to health care system, lived in a pre-transitional stage, in which infectious diseases dominated. In other countries like Peru, a similar pattern exists (Huynen et al., 2005).

Costa Rica is another example of the benefits of medical interventions at the first stages of mortality transition. By the 1970s, in Costa Rica, the decrease of the stagnation of the region resulted in the strong convergence with the developed

countries. Before that the transition was due to the import of low cost and high effectiveness medical technology. The main determinants of the rapid transition were state health interventions, especially those targeted on the less privileged population, although socio-economic developments, such as several improvements in education and communication, and fertility transition also played a role (Rosero-Bixby, 1991).

Up to 1980, Latin American countries experienced steady economic growth, when the gross domestic product (GDP) had an increasing growth rate of 5%. Mainly between the 1980s and 1990s Latin American economy faced a profound crisis, a phenomenon which revealed the structural weaknesses of economic development. In some countries of the area GDP took negative values. Later on, economies started to develop once again but in more moderate growth rates of GDP (around 4%) in comparison with the pre-crisis period (Hofman, 2000). The economic situation is better in Latin America and the Caribbean in comparison to sub-Saharan Africa and several countries of Asia. People in extreme poverty constitute the 8.9% of the population in 2002 (11.3 in 1990; UN, 2006b) while the 9% of the population lives in starvation. According to United Nations data (UN, 2006b) illiteracy does not constitute a severe problem, as the 95% of the children have attended primary school (2003-2004). The 43% of women are employed in non-agricultural enterprises. The mortality of the children aged less than 5 years is far lower than the other regions of the developing world (31 deaths per 1000 live births in 2004) and the 92% of the children are immunized against measles. Again, the overwhelming majority of deliveries are attended by skilled health personnel (88% in 2004). But infant mortality shows great differences between the countries of the area, as well as the sub-national units that constitute them (Figure 12). Even though the relationship is not linear, a positive relationship is found between the minimum national rates and their sub-national range, which means that the bigger the IMR the bigger the mortality disparities in a population. Considering that infant mortality rate is one of the best indicators of the health level of a population, it is obvious that in populations with poor health status, also great inequalities are observed between different parts of them.

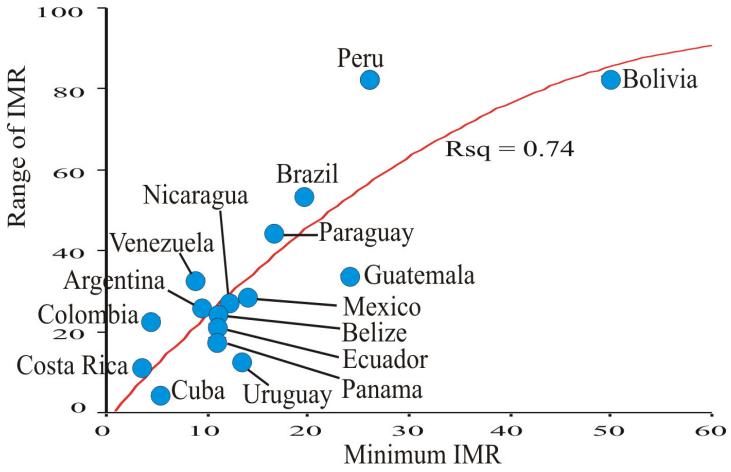


Figure 12: Infant mortality rates (IMR) in the Latin America 1995-1998 (infant deaths per 100,000 live births). Minimum levels and Ranges. Data Source: Castillo-Salgado et al. (2001)

However, infant mortality rates (IMR) have been declining since the 1960s, when they reached a median of about 80 infant deaths per 1000 live births in Latin America. By the 1990s IMRs have dropped to about 20 per 1000 (Castillo-Salgado et al 2001).

The burden of disease in Latin America and the Caribbean consists of non-communicable, communicable diseases, and injuries. A recession of communicable diseases was observed by the end of the 1990s, even though in some countries like El Salvador, their prevalence was quite high and the diseases of the circulatory system remained, despite their relative recession, the major threat of death. Similarly, deaths from neoplasms are also reduced in the majority of the countries (PAHO, 2002). Deaths from injuries are very high because of wars and violence (45% in 2001; Lopez et al., 2006). However, a strong trend of emergence or re-emergence of infectious diseases is observed, as is the case for dengue hemorrhagic fever or measles epidemics in the 1990s (PAHO, 2002). HIV/AIDS prevalence is of the highest in the world in the Caribbean and, generally speaking, moderate high in Latin America (Table 4).

Table 4: AIDS epidemic in Latin America and the Caribbean. Source: UNAIDS/WHO (2006).

	Adults and Children Living with HIV		Adults and Children newly infected with HIV		Percentage of Change in newly infected people between 2004 and 2006	Adult prevalence in 2006 (%)
Region Year	2004	2006	2004	2006		
Latin America	1,500,000	1,700,000	130,000	140,000	7.7	0.5
Caribbean	240,000	250,000	25,000	27,000	8	1.2

In Latin America 'HIV transmission is occurring in the context of factors common to most of Latin America: widespread poverty and migration, insufficient information about epidemic trends outside major urban areas and rampant homophobia' (UN, 2006b; p. 48). HIV prevalence in the Caribbean was 1.2% in 2006, one of the highest in the world. Dominican Republic and Haiti face the most severe problem, but HIV prevalence is high in all the countries except Cuba where it is minimum (0.1%). Even though several countries, like Bahamas, Barbados, Cuba and Jamaica made progress in controlling the epidemic, it seems that heterosexual epidemics occur in the 'context of harsh gender inequalities' (UN, 2006b; p. 44). But also sex industry and sex between men, despite the homophobic reactions of local societies, and unsafe drug instruments are responsible for the phenomenon. In Latin America, HIV prevalence is higher in Central America, a little under 1% in El Salvador, Guatemala and Panama, 1.5% in Honduras and 2.5% in Belize by 2005. In Honduras, HIV prevalence is most severe among ethnic minorities, like Garifuna where it lies between 8 and 14%. In countries like Chile and Venezuela it is very low. More moderate is the epidemic in countries like Mexico, Brazil and Argentina, but in some cities of the last two countries HIV prevelance could be as high as 6%.

Discussion and conclusions

Throughout the history of the human species several changes were observed in the risk of survival. Much of our history is characterized by severe elevations of mortality, as is the case with the famines or several epidemics and also, as it seems quite possible, with high levels of mortality comparing with the modern standards. It seems that, by the end of the 19th century, the industrial revolution and several other socio-economic developments initiated mortality transition in the western world. Even if it is a matter of controversy, medical interventions

also played an important role in mortality transition especially after World War II, along with the improvement of the standards of living, and several other public state interventions as the establishment of a public health system or the improvement of infrastructure concerning sanitation and water supply.

According to the classical theory of epidemiological transition a progressive shift in the causes of death from degenerative to man made diseases is observed during mortality's unidirectional change towards lower levels. This theory fits rather well mortality temporal changes in the developed world up to the 1970s; but serious constraints limit its universal attribution.

In the developing world a delayed mortality transition was observed, following rather complicated patterns in a way that it is very difficult to frame a general deterministic law, governing the mortality changes. Even though the general trend of mortality is the decreasing one, serious upheavals of mortality, especially in the poorer countries, are encompassed in the universal experience. Probably the best example comes from the Sub-Sahara Africa. There, the classical stages of epidemiological transition are not followed. The second stage of transition has not yet overstepped and new epidemics, like AIDs, afflict the continent. Another example is the avian influenza (H5N1), which was first reported in the year 1997 in Hong Kong. Between December 2003 and April 2006, 205 laboratory-confirmed human cases of the virus were reported in 9 Asian countries, while several cases of poultry infections were identified in several European and African countries. The overall virus fatality in humans was 56% (WHO, 2006). The emergence of the new infection caused panic to people and forced countries to take measures in order for the possible epidemic to be avoided, as it actually did happen, while recent reported cases of the disease show that it has not been eradicated. Also, the - once thought - Asian problem of dengue hit America several decades later and infected thousands of people in several countries of Central America (PAHO, 2000). Isn't that to be actually hubristic that man thinks that he has competed all the infectious diseases? Also, how many stages or new patterns should be newly incorporated in order to describe the global variability or future trends of mortality and health characteristics?

The emergence and the re-emergence of new diseases were evident during the whole history of the human species, which is full of such paradigms. All living organisms are subject to evolutionary forces. Taking viruses as example, genetic mutations and recombinations of previously existing infectious agents and the adaptation of animal viruses to human hosts account for the emergence of new diseases. Then, the reactivation of quiescent reservoirs and the reappearance of previously circulating viruses that have spread to other areas account for the re-emergence of infections. Also, the introduction of new infectious agents in one area could be important. Behavioural issues, habitat, migration, deforestation, agricultural evolution and climate changes contribute to the onset and dispersion

of new viral infections. Lastly, viruses can spread easily through travelling, commerce, or animals' migration (Pugliese et al., in press; for the role of viruses in human evolution see Van Blerkom, 2003).

A multivariate frame is formatted not only describing the dynamic relation of the multiple factors influencing the epidemiology of a disease but also underlining the anthropocentric approach to the ecological environment and the results of the exhausting utilization of resources. Environmental reasons account for a significant part of the disease burden. For example, exposure to traffic and air pollution contribute to the circulatory disease mortality differentials observed among different socio-economic strata (Finkelstein et al., 2005). According to WHO (2004), outdoor and indoor air pollution, water, sanitation, hygiene and lead, along with injuries are the major environmental risk factors contributing to the Environmental Burden of Disease in Children. Nevertheless, if the environmental effects on the epidemiology of the diseases are undisputable, the significance of the social, economic, biological and demographic parameters are of equal importance (see Dobson, 1992).

Income and health status are routinely and deterministically connected in literature, i.e. the higher the income the better the health status (see, for example, Preston, 1975). In other approaches, it is the income distribution inequalities among the people in a society, i.e. the low social cohesion, and not income itself, which were strongly correlated with mortality differentials (Wilkinson, 1992; Wlofson et al., 1999, see also Moore, 2006 for a recent revision that allocates peripherality), even though some criticize this view (Judge, 1996). In extreme points of view, like this of Lutter and Morrall (1994), it is argued that state interventions concerning the development of regulations to promote health and safety actually worsen the health status because they are costly and their compliance reduces other spending, including private one. The proposal is then obvious: only economic development without any public social interventions will lead to a long run decrease of mortality and the improvement of the health status of the population. On the contrary, others are concentrated on the effect of the political and ideological systems, blaming neo-liberalism for producing income inequalities and the decline of the welfare state and social cohesion, which on their turn have directly effects on health (Coburn, 2000). However, the direct association of income with mortality has been disputed. Evidence from New Zealand suggests that this association is due to confounding (Blakely et al., 2004; for confounding see Wunsch, 2007). Even though mortality among low-income people was twice as high as that among the high-income people, the adjustment for potential socio-economic confounders (like marital status, education, car access and neighbouring socio-economic deprivation) reduced by half the strength of income-mortality association, while further adjustment for labour force status largely removed this association.

Then, the economic differences between countries may partly explain the observed health stratification, but it also seems that several inequalities on socio-economic grounds produce health inequalities and affect mortality levels. Mortality polarization, which is evident in many cases all over the world, indicates the low social cohesion and the intense social and economic stratification of the societies. The strength and the effectiveness of health care systems, and also the different accessibility of the last, result in the creation of health inequalities. That's why in many countries a better health situation is observed than it would be revealed according to the socio-economic markers, while in others the opposite happens.

Taking in consideration the evidence published by the United Nations, many things remained to be done. African, Asian and Latin American countries are afflicted by poverty, even though this is only one aspect of the struggle for survival of the people there. Though not the only one, an obvious, but challenging, response to this situation is simply the effort at the eradication of poverty. Another aspect is surely the improvement of education, as it is evident in the discussion above. Then, several improvements in children vaccination and also strengthening the efforts at the eradication of several diseases and elsewhere need to be done. A question here remains: the cost. Many countries of the world simply cannot afford the expenses. What should be done to cover them? Probably o rhetoric question for the time being.

Nevertheless, in the multidimensional scheme that controls mortality and health it is very difficult to summarize all the underlining factors. A possible frame is given in the European Union's report of social situation in 2003 (European Commission, 2003a). Environmental conditions are considered to be a very important influential factor of health developments. It is then obvious that state interventions are considered to be very important not only in the development of infrastructure but also in developing state mechanisms for the monitoring and control of pollution, food and water quality and other factors that influence the quality of life, emphasizing, at the same time, the importance of societal and individual responsibility expressed in terms of community, group and individual actions. Among the determinants of health status, the socio-economic status is considered to be essential, defined in terms of occupational status (employment and unemployment, occupational hazards etc.), educational level and income (low economic status and poverty, especially in the poorer countries) etc. In that way, health status is expressed in a broader context of environmental and cultural determinants as well as living and working conditions, while the role of family and other social networks is crucial in promoting better health, mainly in the very young and very old ages, but also in sick or disabled adults. Additionally, life style habits and especially smoking, exercise and abuse of alcohol and illegal drugs, sexually transmitted diseases like AIDS and unintended pregnancies of young women are accounting for a large proportion of the European disease burden. At the same time, car accidents and suicides are

responsible for a large number of deaths, especially of younger people. All those have to be associated with the improvement of health care sector, through the substantial financing and enlargement of health care services, through the developing of quality standards and the arsis of social exclusion, but also through the development and adoption of new technologies.

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Ethics, Communication, PR and Advertising Strategies For the Promotion of In Vitro Fertilized Children: A Case Study in the Context of Turkey*

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Abstract

Ethics and Communication play an important role in the new media of today. On one hand, the way the health issues are handled gets more and more important, on the other hand, the new media regulations try to balance the informativity and acceptability of the messages. The advertisers are trying to find interesting ways of promotions. Societies change via the messages of the media. The impact of the media on the individuals and the societies reach to incredible limits. It could shape not only the values, habits, culture or life style but also the expectations

IVF applications is becoming common in all over the world. Referring back to the IVF applications in Turkey, it might be surprising to see that the first applications go back to the late 1980's. The first application of microenjection started in Ankara Sevgi Hastanesi, a private hospital and by 1990, a university hospital, Ege University succeeded the first IVF baby of Turkey. The first baby of the Süleymaniye Doğumevi was by 2002. Again, the first TESE baby was in Ankara Sevgi Hastanesi.

The IVF baby aspect is associated with many problems in most levels of the society. The reason behind the problem lies in the difference between the reached capacity and the demand stem from the 'trust'. It's just the general case that in the state of decision making, people expect to see some other examples before they act. The dynamics here could be summarized as the media effects,

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the government effects and the personal experiences of the close circles. However, the number of the IVF centers even if they reach up to the number of the 67, mainly centered in the big cities rather than the rural areas where most of the demand come from. This paper discusses at which points and how the problems occur in general. Specifically it also concentrates on the case study in context of Turkey. Today, it is difficult to estimate the full number of the IVF babies born till to date in Turkey. But it is believed that the reached IVF capacity of Turkey is about 25.000 couples a year but the real demand is about 125.000 couples.

Mainly the media is blamed to cause a negative impact on the life styles of the individuals and masses. As the technological developments in the society force people to change their life styles into an entirely different way from before, each new generation is forced to have something different. Sometimes it is the natural result of the production and consumption balances and sometimes the pseudo-demands are produced by the advertisers and marketing people.

This paper is an attempt to analyse the commercials and the concept of IVF. How different it was, earlier in the social circles and how the social and interpersonal communication made changes in it. Individualization and globalization had an impact on the people to make them share even the most intimate subjects in the most common places. How the ethical values were changed throughout the time and what the global ethical values are now? The underlying factors of such a change could be explained through the theories of sociology, philosophy, communication and economics. This paper discusses the commercials and their roles in the society on the way to enlighten them about IVF applications and promote such infertility techniques. To what extent advertising on medical issues be ethical?

Key Words: *Ethics, Communication, Advertising, IVF, Infertility, Health, Children, Turkey*

1. Introduction

Ethics, communication and the values play an important role in the society[1]. Gill states that the reaction and action, inside and outside, enter into a zone of indiscernibility. The seen and the unseen, the viewer's speculation, coincide. When we handle an issue, the way it's been handled, the way it's been presented would carry an enormous value since the scene regarding this issue could only be deciphered through the point it's been placed, through the vaule it's been given and through the function of all these it's been attributed within a given society. The dependability of the issues into the context, value system and the

[1] Gill, 2004:41

social standards sometimes make it impossible to judge and handle it universally.

The field of ***ethics***, also called moral philosophy, involves systematizing, defending, and recommending concepts of right and wrong behavior. Philosophers today usually divide ethical theories into three general subject areas: ***meta-ethics***, ***normative ethics***, and ***applied ethics***.[2]

Metaethics investigates where our ethical principles come from, and what they mean. Are they merely social inventions? Do they involve more than expressions of our individual emotions? Metaethical answers to these questions focus on the issues of universal truths, the will of God, the role of reason in ethical judgments, and the meaning of ethical terms themselves. *Normative ethics* takes on a more practical task, which is to arrive at moral standards that regulate right and wrong conduct. This may involve articulating the good habits that we should acquire, the duties that we should follow, or the consequences of our behavior on others. *Applied ethics* involves examining specific controversial issues, such as abortion, infanticide, animal rights, environmental concerns, homosexuality, capital punishment, or nuclear war. By using the conceptual tools of metaethics and normative ethics, discussions in applied ethics try to resolve these controversial issues. The lines of distinction between metaethics, normative ethics, and applied ethics are often blurry. For example, the issue of abortion is an applied ethical topic since it involves a specific type of controversial behavior. But it also depends on more general normative principles, such as the right of self-rule and the right to life, which are litmus tests for determining the morality of that procedure. The issue also rests on metaethical issues such as, "where do rights come from?" and "what kind of beings have rights?"[3]

1.1. A Society of Exceptions

As Diken states we live in an increasingly fragmented “splintering” society in which distinctions between culture and nature, biology and politics, law and transgression, mobility and immobility, reality and representation, immanence and transcendence, inside and outside… tend to disappear in a “zone of indistinction”.[4] To him, to understand the social bond one has to understand what it excludes.[5] In this respect, it might be possible to question the IVF as an inclusion or the exclusion to the necessities of the society. Whereas it may be a necessity for a society, but not for another. That’s why, one may be forced to

[2] Fieser, 2005:1

[3] Fieser, 2005:1

[4] Diken, 2005: 4

[5] Diken, 2005: 6

take part in one of the "camps" to argue and bear the consequences of the camp. At the end, the distinction is replaced with the concept of indistinction. [6]

It might be a value to decide, who needs the IVF treatments, considering the human rights and basic values of a democratic country. The questioning of having equalities on the basis of having a child and providing the necessary basics of life to the child is an issue to be discussed. Apart from the social pressure put on the couples, although it could be represented in different ways and aspects depending upon the gender issues, the individuals could also have their inner pressure to have children of their own. In that case doesn't matter how crowded the outer family is regarding the siblings and the children of the brothers– sisters of the parts, the couple yearns for their own child even if they are incapable of providing the necessary –physical, educational, environmental, economical, social- basics it might have required. In this case, the communication between the couple and the society, between the couple and the relatives, between the couple and the media messages breaks down.

Under all these conditions, due to the stress they experience, the couple together and the individuals of the marriage tend to understand all the messages from negative points of views referring to their incapability and infertility. It becomes a main wall for both genders preventing the normal messages to pass such a filter in their minds and lives. They start to see themselves as the exceptions of the culture, society, nature, etc.

Turkey is one of the countries having a very young population, depending upon the 2000 statistics, Population by age group and sex in Turkey is as follows. (Table 1). The infrastructure of Turkey gains more importance when it comes to the services to be provided to children as health, medicine, education, transportation, civil services, public and social services, etc. The quality and the sustainability of these services become another problem considering the budget and productive part of the population. Seeing a number of children in the families one may have the assumption that Turkey does not have many families suffering from infertility. Actually, the governmental applications and the UNICEF played an important role in decreasing the mortality and morbidity in recent years, many precautions were taken to ensure the children rights and healthy development of the child both in the family and in the society. But still the unique structure of the society in Turkey has an important effect on the child issues. Because child has not only an emotional, parental aspect in the family, it also carries many social, ideological, political, economical aspects in its own dynamics.

Table 1: Population Distribution in Turkey

[6] Diken, 2005:12

Age group	*Total*	*Males*	*Females*
Total	67 803 927	34 346 735	33 457 192
0 - 4	6 584 822	3 396 690	3 188 132
5 - 9	6 756 617	3 485 746	3 270 871
10 - 14	6 878 656	3 570 657	3 307 999
15 - 19	7 209 475	3 691 218	3 518 257
20 - 24	6 690 146	3 426 714	3 263 432
25 - 29	5 895 255	2 976 430	2 918 825
30 - 34	5 009 655	2 552 370	2 457 285
35 - 39	4 854 387	2 453 579	2 400 808
40 - 44	4 068 756	2 083 531	1 985 225
45 - 49	3 368 769	1 710 757	1 658 012
50 - 54	2 717 349	1 356 391	1 360 958
55 - 59	2 058 422	1 016 254	1 042 168
60 - 64	1 829 288	864 299	964 989
65 - 69	1 645 517	794 881	850 636
70 - 74	1 172 643	517 870	654 773
75 - 79	577 597	254 443	323 154
80 - 84	246 692	98 797	147 895
85 +	216 500	83 572	132 928
Unknown	23 381	12 536	10 845

1.2. Having a Child in Turkey

Although shrinking in nowadays, with the new socio-economic system, Turkey shows a typical large family structure for the last few generations. In this large family, there are more than one families living together with their siblings and the communication strategies of the families mainly effect the children. Even if the change to the nuclear family status effect the children in recent years, mainly todays parents follow what they have been educated within those large family systems.

Equitable utilization of the resources is a very important thing when it comes to the ethical issues. Cultural diversity and human interaction at all levels play an important role in the establishment and application of the ethics. Last 50 years to meet the rapidly growing demands for food water, timber, fiber and fuel. We live in a world of wars and difficulties, urban and rural controversies, still we have some hope for some peace in future. Whereas 40 young people commit to suicide in every 5 minutes, child / youth friendly services increase in each society. But the new consumption society and marketing for kids have an enormous effect on the society. In respect to national and religious problems, stemming from the identity and ethnic problems, the policy makers know who that child will be(come), but not the parents.

Having a child in Turkey perhaps has a lot more to do with the social issues rather than the health issues in general all over the world. Especially in rural areas when a couple gets married with the permission of their families, they are either settled down in their own house separate from the parents or depending upon the education and income level of the families, the ages and social status of the individuals they are a bit forced to take place in the pre-established housing of the older generation. This togetherness with the 'others' in the society, either in individual housing conditions or not has a function of a 'big brother' effect on the new family, affecting all their behaviours and decisions. After a certain time, the 'others' around begin to ask questions about the 'baby' as the condition of becoming a ***'real family'***. Before the baby, a couple is accepted to be just a couple, only married and legalized by the society, but a baby is required to call them a family.

"Family" is the basic system and unit given importance from the very earliest times.[7] With its general definition, the family consists of the parents and children. For some of those, it is the unification of the past values and the present system, the medium of the traditions, language, believes, having the aim of transferring these vaules as an economic, social unit and institution.[8] For some others it is the smallest unit of production and consumption. This last point of view gained more importance in the lights of the recent consumer society concepts.

The society we live in is changing continuously and the concept of child is also changing and enlarging to cover more and new aspects. The meaning, function and identity of the children also change within the society and as the identity changes so does the society. The fundamentals of communication change from one society to another and depending on it the communication within the family

[7] Chicholm, Lynne, 1990.

[8] Gough, K., 1975.

and other systems of the society is shaped. The communication style and strategies of the individual take its roots from the traditions, from social relations and gets its unique style regarding time, place, situation and the function of the communication.

Depending upon the social structure and the functions of the different levels of the society, the importance attributed to children could change in different ways giving way to the different placements of the child and the parents in different societies. However the couple always finds a way to take part in the interaction and is effected through this interaction positively or negatively, permanently or temporarily. In this sense, the couple is seen as a nomad, traveling between the camps but not belonging to any of them. That's why, their situation requires a kind of risk management. As Bauman states, inclusion and exclusion for the camp take place through continuous, mobile forms of surveillance as is the case with risk management in relation to 'networks' or 'cross-border regulation' with respect to divergent sets of flows of subjects and objects.[9]

When we consider the consistency and efficiency of the communication between the couple and the society, the main thing to be considered is the quality of the communication and communication with the knowledgeable people around. Whereas in the past there were old people guiding to the newly wed in the best possible way, we have now the media guiding, directing the couples effectively, providing them an atmosphere equally shared and interactive via the online access or telephone connections. The people connected now are not the old people of the past, but the trustable, professional, well-known brand names having more impact on the individuals and the society. What they say, guide, advice seem to be more convincing and credible than the others in the near neighbourhood.

To give an example, 10 years ago, not much importance was attributed to topics like IVF or adoption of children, etc. but now we believe that with the effect of media and interactive communication many people raised an awareness to such issues and there appeared a new demand giving hope to many infertile families that they'll not be isolated in the society any more, there could be more things to be done, or at least a chance to meet with the others sharing similar problems with them.

As a summary, it could be claimed that different society structures, different life-styles and beliefs bring out:

- different positioning of the children issues
- different levels of maturity in individuals,

[9] Bauman, 1998: 51

- different habits, attitudes, behavior and communication styles regarding the children issues.

It's important to see the differences between the societies. The communication style of doctors with the IVF families in England, France, India or Brasil would be very different from the one in Istanbul, Turkey or Adana, Turkey, or Erzurum, Turkey. That's why, it is difficult to reach to universals.

Not only in the social traditions but also in religious beliefs the place attributed to the child in the society is very clear. Throughout the centuries the child is looked upon as the carrier of the values, norms and the traditions in the society. At every stage of the history, having a child, whether it is a boy or a girl is looked upon as a present from God, as a step to be socialized and as a means of becoming a real family. The families having children are considered to be the happy ones and the ideal family is imagined as the one having two children, one boy and one girl. The family seem to be complete when they have enough for their children, i.e. education, life-standards, etc. The family is also obliged to provide the basics to their children as to make them autonomous individuals in the future. Most of the Turkish Cinema films are full of stories of sacrificed mothers/fathers/parents for the happiness of their children. The children are the fulfillment of the desires, hopes and expectations of the family. It's the future of the family and the society.

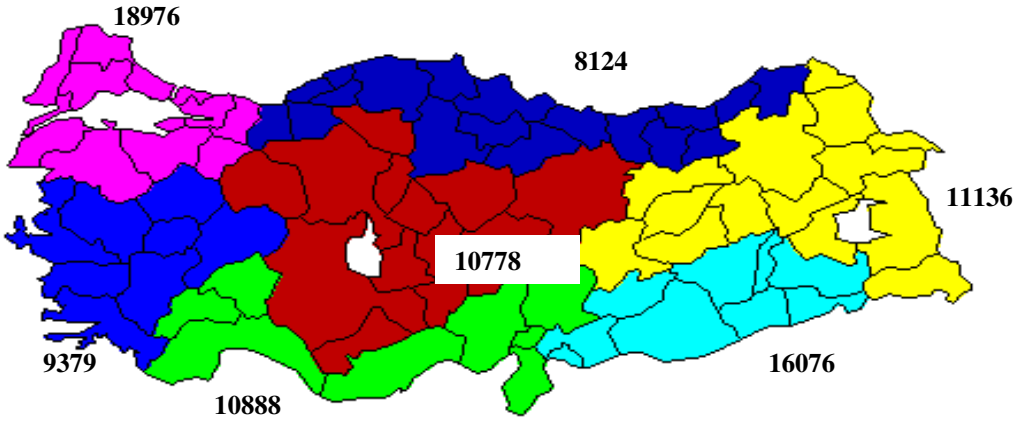
1.3. The Child In the Family

With its legal definition, the child is the product of a married man and woman, the smallest member of the social institution. It's important to note that the child is not a small individual but an individual having his/her own character, choices and unique qualities. The child is not a model of the adult, having his/her unique structure of communication, perception and character. Physically, emotionally, socially s/he needs to be heard and placed appropriately in the given society. Misplacement of the child in the society could cause many problems in the near or far future.[10]

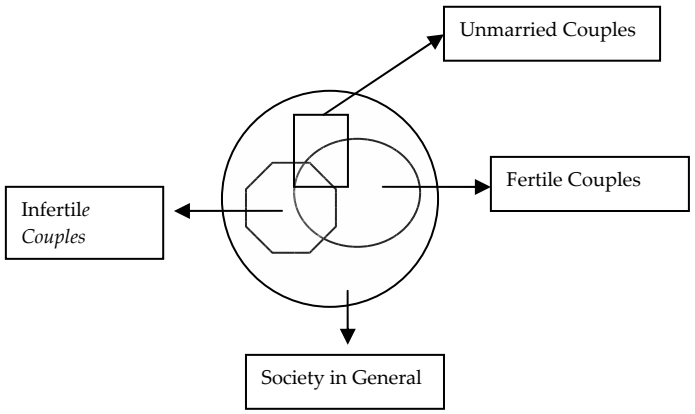
Considering the number of the children in the family, the following graph might be useful to give an idea of the general picture in Turkey.

[10] Zinnekar, Jurgen, 1990.

Fig.1:The number of the patients per state healthcare center, Turkey, 2004



The families having children and not having children form their own circles each excluding each other. Within the communication environments it's important to have a child or not. Thus, the family should belong to one of the circles and be excluded from the other, just like *having a 'camp' as a temporary site and an ordering machine, identified with a particular life form*.[11] As Diken says, the norms for the camp people can only be understood through an investigation of the exception. It is a kind of recognition of a state, as 'external' and the camp is the exception incarnated. But, the state of exception is limited in space and time: That means that a couple without a child physically belongs to a camp of people not having a child but, potentially, they may have a child any time, that means their membership of this group is a bit of a temporary one. As soon as they have the child, they become mobile and belong to another camp. It thus became permanently impossible to distinguish between the rule and its exception.[12]



[11] Diken, 2005: 16

[12] Agamben, 1998:168

Considering the communication and interaction field, a couple is banned to have a permanent place in the camp of the people without children. They may have a communication on the surface level but not in the deep structure. It is the same for the infertile couple. Worse than the other perhaps, they feel themselves as not the members of the fertiles camp or the infertiles camp. Their residence in both camps seem to be at the surface level and on temporary basis. They are soon expected to move to the other camp, that's why, this state of being there is somewhat temporary. The people having no children could take part in sample conversations regarding the children issues, but not vice versa. But, the couples having no children for a long time, namely the infertile couples, would also be excluded from this camp. Indeed, the banned individual, or homo sacre, seemed to live in a state of exception and such he was Friedlos, a 'man without peace'.[13] As Agamben states "Homo sacer can be treated badly, violently, even can be killed but not sacrificed".[14] The couple in this case could be regarded as the scapegoat is abandoned from the community and be excluded from all forms of communication regarding the children and future issues.

Biopolitics addresses not the singular body of homo sacer but a 'multiple body', a body with countless heads.[15] To Diken, this multiplicity is constituted in the form of aggregates such as the labor force, the old, the young, the sick, etc. and as is the case with the objects of political steering, a whole range of technologies and scientific knowledge is produced to contain and transform this multiplicity. The paradoxical consequence of mobility is immobility.[16] As he suggests, the definition of nomadism and its relation to mobility is crucial and nomadism is related to deviation.[17] It is by deviation and not necessarily by physical movement that the 'nomad' creates another space. I put the IVF circumstances into such a space, transferring the nomads into 'citizens' / members of a certain society to create their own space within the very society. Considering the monthly birthrates of Turkey in 2004, it could easily be seen that the number of the babies born with the help of healthcare people are high enough.

[13] Agamben, 1998: 104

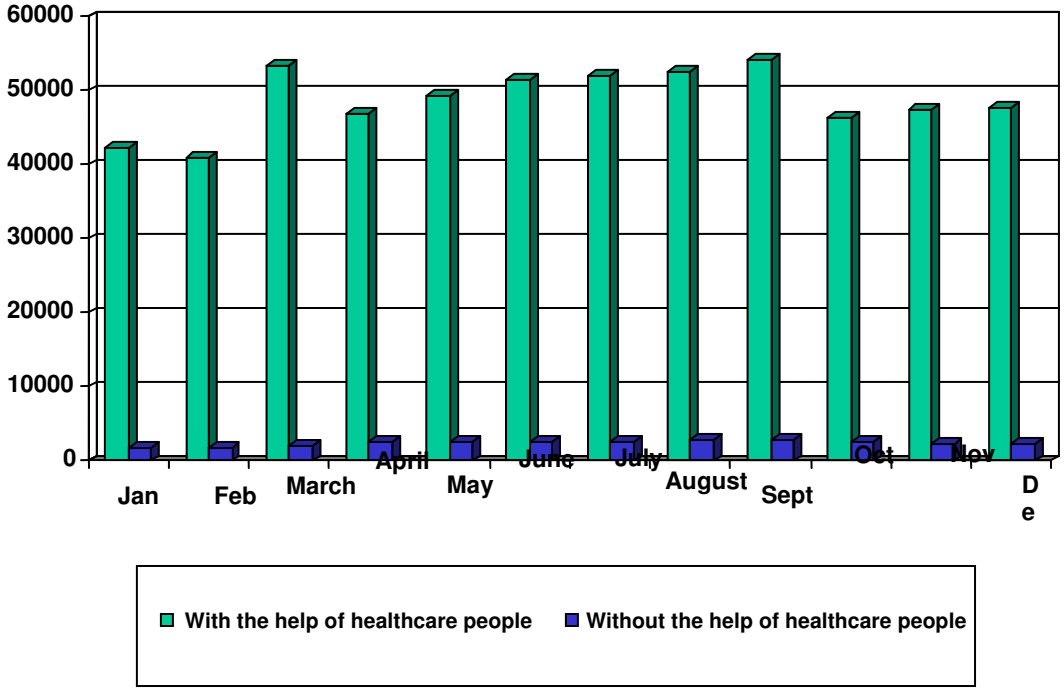
[14] Agamben, 1998: 111-5

[15] Focault, 2003:245

[16] Diken, 2005: 65

[17] Diken, 2005: 72

Fig.3 Monthly Birthrates of Turkey, 2004:



2. History of IVF in Turkey

Referring back to the IVF applications in Turkey, it might be surprising to see that the first applications go back to the late 1980's. The first application of microenjection started in Ankara Sevgi Medical Hospital, a private hospital and by 1990, a university hospital, Ege University sucseeded the first IVF baby of Turkey. The first baby of the Süleymaniye Doğumevi was by 2002. Again, the first TESE baby was in Ankara Sevgi Hastanesi.

It is difficult to estimate the full number of the IVF babies born till to date in Turkey. But it is believed that the reached IVF capacity of Turkey is about 25.000 couples per year but the real demand is about 125.000 couples.

Looking at the numbers involved it might be easy to notice the problem and the reason behind the problem. The difference between the numbers of the reached capacity of patients and the demanding group is huge. This difference stems from the concept of 'trust'. It's just the general case that in the state of decision making, people expect to see some other positive examples before they act. The dynamics here could be summarized as the media effects, the government policy and the personal experiences of the close circles.

Furthermore, the number of the IVF centers even if they reach up to the number of the 67, mainly centered in the big cities rather than the rural areas where most of the demand come from.

IVF Centers	Number	IVF Centers	Number
Adana	4	İstanbul	27
Ankara	15	İzmir	6
Antalya	2	Kayseri	2
Bursa	2	Kocaeli	1
Denizli	1	Konya	2
Eskişehir	1	Sakarya	1
		Samsun	1
	Total	***66***	

2.1. The Importance and Function of IVF Technologies in Turkey

Many people in abroad could think that Turkey as one of the Islamic countries could have some problems with the IVF applications. Many others have the supposition that being Muslim prevents to have adopted children or IVF children. On the contrary, Turkey is one of the leading countries (one of the first three) considering the information, technology and application of IVF. It is also very interesting that the sector welcomes patients from not only the big cities but also from rural areas up to a 20 % and even from abroad, 10 %. Considering the costs of IVF, Turkey is also in a very advantageous condition since it is much cheaper than any other country in Europe. For example, the cost of a single IVF cycle varies between 17500-25000 US$ in Turkey including the medical treatments whereas the applications in abroad could reach to 4000-5000 US$. Similarly, whereas a 45£ is taken as a minimum examination cost in England, in Turkey, the first examination in IVF centers is usually free.

In Turkey, the ethical discussions are still going on, since in most cases, the family has a greater chance to have a baby with the implementation of three embryos (35 %) and some are given 2 embryos (27 %) depending upon their situation. The discussions are both on the academic side and on the public side. As one of the important steps we may recall the 13th World IVF Congress held in Istanbul in May 2005. The most important people from all over the world, 2000 doctors from 30 different countries joined to the congress and ethical discussions. Among those to cite, Southern Korea, W.S. Hwang (known as the father of the Dolly the sheep), Dr. Robert G. Edwards known as one of the leaders of the first IVF baby Luis Brown -1978. Dr. Catherine Rocowsky from Harvard University and Prof. Dr. Victor Gomel supporting the single embryo

transfers were also the important figures. Prof Dr. Tinus Kruger from British Colombia University also suggested to tell lies to the public, not to let them hope more then they should. The head of the Congress Prof Dr. Timur Gürgan was very satisfied with the congress. The congress people and their interviews, pictures took part in most of the broadcasting programs and on newspapers. The congress created an agenda and a flow of information between the academics and public.

Considering the IVF applications used in Turkey, it could also be seen that they are all up-to-date applications similar to many advanced countries in the world. The possible different techniques could be mentioned such as

- IVF : In Vitro Fertilization
- GIFT : Gamete Intra Fallopian Transfer
- ZIFT : Zygote Intra Fallopian Transfer
- ICSI : Intra Cytoplasmic Sperm Injection (TESE ve MESA-PESA techniques)
- IUI : Intra Uterin Inseminasyon

Many different issues are considered to be discussed when it comes to the ethical evaluations of IVF technology. These could be summarized as the cryopreservation and the extent of the period, written agreements between the health center and the patients, the disposition of the embryos, transparency, IVF costs, stem cell research, etc.

2.2. Cryopreservation and Ethics

As one of the recently discussed topics, Cryopreservation is one of the most important and debated concepts when it comes to the IVF applications. For safety reasons only a limited number of embryos can be replaced during the fresh cycle. In almost all centres, the remaining embryos are cryopreserved for later use. Two general questions are raised by this practice:

The general ethical considerations concerning the cryopreservation and ultimate fate of human embryos produced during IVF treatments are discussed mainly.[18] The discussion is centred around two general questions:

- Who should decide what happens with these embryos? and
- What should be done with the embryos?

Special attention is given to the necessity of consent of both intended parents and to the practical solutions in case of disagreement. This problem is linked to

[18] ESHRE , 2001: 1049-1050

the question of the validity and revocability of the prior agreement or contract signed by the intended parents concerning the ultimate fate of these embryos.

The ethics in the cyropreservation costs is another case. Regarding that for each cyropreserved embryo the center asks for a sum of about $100, this issue should also be under the control of ministry of health.

2.3. Elimination of Certain Sexes and Ethics

Turkey is not a country like China where only one child is permitted and people. Even if the population seems to be higher than most of the European countries there is no restriction on the families and the number of the babies they could have. One other ethical issue to be discussed is that, the demand from the families come through in the way of the determination of the sex of the unborn and the elimination of the possible genetic disorders. The anomalies could only be foreseen but not be eliminated fully. Yet, the data shows that the children of the infertile families might also suffer from the infertilization in future.

Having a baby in Turkey has multiple meanings. It's usually seen as the responsibility of the female whereas the neighbours and the close relatives having high expectations of the couple have a great effect on the way to the IVF Centers. Even if the couple seem to have insufficient background for a possible baby, notwithregarding their incapabilities the family and the surrounding circle around them force the possibilities.

2.4. Written Agreements and Ethics

The families are expected to have a written agreement before the treatment starts. Through this kind of a written agreement it is believed that the rights of the individuals would be preserved and documented. But somehow in nowadays, the opposite to the belief of the prevention of the rights of the couples or the individuals, also the rights of the doctors or the dynamics of the system became the issue. However, both parts agree that, there should be some written agreements to ensure the process and the quality. Many reasons could be cited to have a written agreement. For example, there should be a written agreement in order

- To confront the patients and the centre with their responisibility for the disposition of the embryos
- To detect and prevent, as far as possible, conflicts regarding the fate of the cryopreserved supernumary embryos (e.e. what will happen in case of death, or disagreement between the partners)

- To state clearly all possible future dispositions regarding the embryos.
- The options among which the intended parents may choose are.
- Replacement withing the paranatal project
- Authorization for research
- Authorization for donation to others
- Donation to the surviving partner for replacement
- Disposal.

2.5. The Extent of the Cryopreservation Period and Ethics

Though many countries have their own rules and applications, the extent of the cryopreservation period is another question. In many countries it is clearly stated in the law whereas in many others the requirements of the day by day demands bring the issue into a more important point. The period should be clearly limited: The Ethics Task Force[19] equally accepts two options: a standard period of 5 years, that can be renewed on the patient's demand for one term (a total of 10 years) or a standard period of 3 years that can be renewed twice (a total of 9 years). The maximum storage period can be extended beyond the periods mentioned above if there are medical reasons for storing the embryos. Embryos should only remain stored up to the age at which the establishment of pregnancy is medicaly advisable.

The decision about the disposal of the embryos is attributed solely to the intended parents. If a gamete donor is involved, the donor relinquishes all rights and duties from the moment that the embryo is created. When embryos are donated, all rights and obligations end at the moment of transfer to the recipient women. Attributing 'extended' rights to the donors would run counter to the whole concept that frames the meaning of the donation.

A person's position regarding the moral status of the disposition of cryopreserved embryos is to a large extent based on the view s/he adopts on the autonomy of the patient. The expression of autonomy is the ability to bind oneslef in the future. One other expression of it is the ability to change one's mind on the basis of new experiences and new information. A person should always be able to alter his/her decision when intervening events change the circumstances in such a way that the originally signed contract is not relevant to the new situation.

[19] ESHRE , 2001: 1049-1050

2.6. The Disposition of The Embryos and Ethics

The disposition of the embryos after the death of one of the partners is a particularly delicate issue. Regarding the issue of post-mortem reproduction, two sources of disagreement are present: the position on whether or not such treatement can be part of a parental projects and the decisional authority of a person over his/her genetic material after his/her death.

The adice that should be given to the couples considering assisted reproductive technologies for the treatment of their infertility, when they are completely opposed to the destruction of surplus embryos, is discussed. It is urged that they do not use treatments that generate surplus embryos. They should be given the options of declining IVF and considering adoption, or less efficient treatments, namely limited ovarian stimulation, limited insemination of available ova or natural cycle IVF where no surplus embryos are generated.[20]

The spare embryos to be donated to another couple: the cases are likely to be rare. Embryo transfer is not alowed in several countries for ethical, religious and legal reasons. The problem is multifaceted where several ethical and legal issues to be considered. Although these academic considerations highlight the problems, there is no neat solution to the problems.

The difficulty in finding a universal solution is that our individual ethical values vary enormously, sometimes irreconcilably, due to our different cultural and educationl backgorunds on the nature of human embryos.[21] Our only recourse is to resolve ethical impasses by avoiding them.

Alternatively these patients may also wish to consider using limited ovarian stimulation, limited insemination of available ova or natural cycle IVF, so that only one or a few embryos are created for transfer in a fresh cycle. All sygotes considered by the embryologist to be normal wolud be replaced in the patient and no embryos would be cryopreserved. The patients should also be informed that some of these treatment options may have a lower probability of success than using conventional controlled ovairan stimulation protocols.

2.7. Transparency and Ethics

Transparency is required both on the couples' side and on the medical side. There must be total transparency with respect to the health of the donors (male

[20] Biggers, J.D., Summers, M.C., 2004: 2457-2459

[21] Biggers JD , 1989: 551-562.

and female) and the baby or babies produced by the IVF procedure that resulted in the surplus embryos. At the time the first IVF baby was produced[22] there were no epidemiological studies on the natural incidence of human congenital abnormalities.

Many potential recipients opting for treatment accept these levels of risk, particularly, if they are willing to use subsequent genetic screening and if necessary abortion.

In a normal pregnancy there is at least a 4-5 % risk of the birth of a severly impaired baby. If investigation by a clinical geneticist anmasked a serious known genetic mutation, the risk of an abnormal child would be 25-50 % depending on whether each parent carries a gene mutation or not.

2.8. IVF Costs and Ethics

The data derived from the Dan District Registry of the General Health Services of Israel, the largest medical insurer in Israel gives us the results that 171 women underwent 254 oocyte donation cycles within these 3 years, and 45 babies were born, for a positive outcome of 17.7 %. Average annual cycle cost was US $1742 and average annual cost per patient US $ 2521. The total annual cost for the distrtict accounted for only 0.05% of the budget.[23]

In many countries it is an issue that IVF costs are too high for all the infertile couples in need so much that for most of them treatment could not be afforded. Even if in many cases, there is a kind of state support to the issue, this could only be provided at a certain limit of cycles and could only cover a part of the treatment. However, the right of having a baby and affording to have a baby seem to be contradictory issues.

One other issue is that, the state applications usually stay at the level of 27 % success whereas the private sector applications could reach up to incomparable levels. The underlying factor is estimated to be as the quality of the used material (test tubes and the kits to be used, etc) and the state affordable ones were looked upon as the ones having low standards whereas the private sector could afford the higher standards of the quality. In that case, whether only the rich and affording couples could have the successful and better results or not is an ethical issue to be discussed.

[22] Steptoe PC and Edwards RG , 1978: ii, 366.

[23] Rabinerson, D. Dekel, A. Orvieto, R. Feldberg, D. Simon, D. Kaplan, B., 2002: 1404-1406.

2.9. Multiple Pregnancy and Ethics

Treatment-related multiple pregnancy poses the biggest threat to the safety of IVF. Despite a double embryo transfer (DET) policy in most European centres, twin rates continue to be unacceptably high at 20-35 %. Elective single embryo transfer (SET) is an effective way to minimize twin pregnancies, but the debate surrounding its routine clinical use continues.[24]

In Turkey, apart from the extraordinary situations, 2-3 embryos are put for each cycle. The reason for this could be summed up as the high costs of the IVF applications to the health security and family. Due to the economical enforcements on both the family and the country, it seems that having a positive result sooner means more than the ethical issues regarding the number of the embryos. For example, regarding the facilities of the hospitals, if one should make a comparison, neither the use of the per incubator nor the full number of them are similar to the hospitals abroad. In abroad a hospital could have at least 20 whereas in most cases the number starts by two or three in Turkey's conditions. Comparing the cases for each incubator the number does not go beyond 1 in the abroad cases, whereas the number in Turkey reaches up to 30-35 in some centers.

Heijnen states that changing the way in which successful IVF treatment is defined offers a tool to improve efficacy while reducing costs and complications of treatment.[25] Crucial to this paradigm shift is the move away from considering outcomes in terms of the single IVF cycle, and towards the started IVF treatment as a whole. The important end-points are important not only for patients but also for clinicians, health economists and policy makers. Such an approach would encourage the development of patient-friendly and cheaper stimulation protocols with less stress, discomfort and side effects. As a solution, the combination of mild ovarian stimulation with single embryo transfer may provide the same overall pregnancy rate per total IVF treatment achieved in the same amount of time for similar direct costs, but with reduced patient stress and discomfort, and the near complete elimination of multiple pregnancies. This would offer major health and indirect cost benefits. If IVF success rates were to be expressed in terms of delivery of a term single baby per IVF treatment (or in a given treatment period) the introduction of single embryo transfer on a large scale would be facilitated.

The most relevant standard of success in IVF has been discussed widely. Tiitinen and the others add more to the discussion on the most relevant standard

[24] Bhattacharya & Templeton, 2004: 1939-1942

[25] Heijnen, Macklon & Fauser, 2004: 1936-1938

of success in ART.[26] An optimal standard should reflect both the risk aspects and the effectiveness of the treatment. The most important parameter for the couple is the ultimate cumulative delivery rate per started cycle. To them, even if the long-term follow up of the treatment cycles is difficult in practice, we would stress that more emphasis should be given to embryo freezing, in order to maximize the efficiency of the IVF/ICSI cycles. The contribution of embryo cryopreservation in elective single embryo transfer cycle programmes may result in a cumulative delivery rate of >50%. For example, in Finland, the implementation of single embryo transfer has been possible with good crycopreservation programmes. The effect of this strategy has been seen in a decrease in the proportion of twin deliveries after assisted reproduction, beign 13,9% for 2002, as well as a reduction of the proportion of multiple births in the nationwide Medical Birth Registry.

2.10. Stem Cell Research and Ethics

On 25 April 2002, the German Parliament has passed a strict new law referring to stem cell research. This law took effect on July 1, 2002. The so-called embryonic Stem Cell Act permits the import of embryonic stem (ES) cells isolated from surplus IVF-embryos for research reasons. The production itself of ES cells from human blastocysts has been prohibited by the German Embryo Protection Act of 1990, with the exception of the use of ES cells which exist already. To Oduncu, the debate on the legitimate use of ES cells escalated, after the main German research funding agency, the Deutsche Forshungsgemeinschaft (DFG), unexpectedly published new guidelines recommending a restricted use of human ES cells for research.[27] Meanwhile, the debate has ethically divided society, political parties, government and church members into a group supporting and a group rejecting ES cell research. The arguments in favour of such a research can be summarized as arguments derived from a new "ethics of healing" calling for a therapeutic imperative, whereas the arguments against can be summarized as arguments violating the fundamental principle of human dignity as they imply the destruction of human embryos.

2.11. Cryopreserved Embryos For Treatment or Research and Ethics

Depending upon one of the researches done in the field it could be said that the main reason for not utilizing surplus embryos was "successful delivery" (85%), "consider family completed" (61%) and "too short legislative limit for cryopreservation" (50%).[28] 60% of the couples agreed to the concept of donation

[26] Tiitinen, Hydèn-Granskog & Gissler, 2004: 2439-2441

[27] Oduncu, Fuat S. , 2003: 5-16

[28] Bangsbøll, Pinborg, Andersen & Andersen, 2004: 2415-2419

of cryopreserved embryos for infertility research, 57% responded affirmatively to donation for stem cell research and 49% for stem cell treatment, but only 29% agreed to the concept of donation to infertile couples. As a conclusion, this study and the others show that 23% of all couples having cryopreserved embryos do not utilize them for further treatment within legislative storage period of 2 years. According to another research, the majority of couples (54%) consented to donate their surplus embryos for research.[29]

In October 2003, the Attorney Genaral of the Government of Israel published guidelines allowing posthumous sperm retrieval for the purpose of later insemination or IVF by the surviving female partner.[30] One other paper presents an ethical and psycho-social critique of the guidelines, which challenges their basic premise that personal autonomy over-rides any other ethical principal and argues that the autonomy of the adult should not orver-ride the well-being of the offspring.[31]

Oocyte freezing is an established technology but, in contrast to embryo freezing, it has very limited application in clinical IVF programmes. Nevertheless, empirical improvements in freezing protocols and the use of ICSI for fertilization have led to an increasing number of live births.[32] When it comes to the question of "when to avoid creating surplus human embryos", Biggers and Summers provide some key steps.[33] To them, the advice that should be given to a couple considering assisted reproductive technologies for the treatment of their infertility, when they are completely opposed to the destruction of surplus embryos is discussed. It is urged that they do not use treatments that generate surplus embryos. They should be given the options of declining IVF and considering adoption or less efficient treatments where no surplus embryos are generated.

Primary infertility is a key issue in the developed world, while the developing world has high rates of secondary infertility. To the Report of Bertarelli Foundation, IVF has become the standard therapy for female infertility and ICSI for infertility of the male partner.[34] However, the use of these therapies should not be initiated without a through investigation and whenever possible,

[29] Choudhary, Haimes, Herbert, Stojkovic, Murdoch, 2004: 2096-2096.

[30] Landau, 2004:1952-1956.

[31] Leeanda Wilton, 2005: 33-41

[32] Josaine Van der Elst, 2003: 463-470,

[33] Biggers & Summers, 2004:2457-2459

[34] Lunenfeld & Van Steirtegham, 2004:.317-326

individual diagnosis of the underlying causes of infertility. Multiple gestation remains one of the most challenging and controversial issues in the treatment of infertility. Current IVF practices are often blamed for this, in this respect, attention should also be focused on the role of ovarian stimulation in ovulation induction. National guidelines and national registries for assisted reproductive technology (ART) are becoming more widespread and are expected to play an important role in promoting best practice in ART in the future.

3. IVF Families and Ethics

Klonoff-Cohen state that there is no greater tribute to the importance and efficacy of IVF than the fact that >1x 10^6 babies have been born to infertile couples since its clinical introduction in 1978.[35] In-vitro fertilization (IVF) can be considered either as a medical miracle or playing with divinity. What obligation do medical professionals have to infertile women and to what extent? The bioethical dilemma of IVF use encompasses different moral issues for all involved in the process. Ethical issues address respect for personal autonomy, access and care, and the duty of the health care provider to be compassionate to persons whose actions and moral values may be different from their own. Health care providers need to impart empathy, understanding and sensitivity towards this unique type of patient population. The conflict for those treating patients who are trying to conceive by IVF includes respect for personal autonomy, nonmaleficence, justice, utility and the ethics of care.[36]

Fertility treatments raise a range of social and ethical issues regarding self-identity for family, sexual intimacy, and the interests and welfare of potential children. Perla states that eggs and sperm are combined to produce fertilized eggs. These eggs are then implanted as embryos and grow into viable fetuses, which are carried by the original mother or a surrogate mother. To Perla, this artificial form of conception can challenge religious values and family structures.[37] The selection and application procedures were all behind the closed doors that nobody could interfere except the permitted ones.

Reproductive endpoints of IVF (i.e. oocyte aspiration, fertiliation, embryo transfer, achievement of pregnancy, live birth delivery and perinatal outcomes e.g. birthweight, multiple gestations) have many debates on ethics as well. According to research, there is compelling evidence that smoking has a negative

[35] Klonoff-Cohen, H. 2005:180-204

[36] Perla, Lisa, 2001:152-158

[37] Perla, Lisa, 2001: 152-158.

influence on IVF outcomes, whereas for stress the evidence is suggestive, yet the effects of alcohol and caffeine on IVF is inadequete.[38]

Golombok presents the findings of the second phase of a European longitudinal study of families, created by assisted reproduction.[39] The present investigation reports on a total 102 IVF families, 94 donor insemination (DI) families, 102 adoptive families and 102 families with a naturally conceived child. The assisted reproduction children were functioning well and did not differ from the adoptive or naturally conceived children on any of the measures of psychological adjustment. However, only 8.6 % have been told about their genetic origins. As a conclusion, IVF and DI families with an early adolescent child appear to be functioning well. Many IVF laboratories perform premiplantation genetic diagnosis (PDG) with FISH (flourescent in situ hybridization) to select embryos that are free from some aneuploidies in an attempt to improve implantation, pregnancy and live birth rates in particular categories of IVF patients.

3.1. How will today's arguments be viewed from the perspective of 2020?

David Barlow in his editorial paper asks the question "How will today's arguments be viewed from the perspective of 2020?".[40] He states that the leading medical journals in reproductive medicine and science seek to publish innovative studies on cutting edge work relating to assisted reproduction. When the issue is pre-implantation genetic diagnosis, there are several ethical questions to be discussed. SET started in the late 1990s with the limitation of embryo transfer to two embryos in some countries 2ET is now the recommendation: Australia (Reproductive Technology Accreditation Committee requirement), Finland (by agreement between the clinics), Israel (for women <40 years of age in their first three cycles), The Netherlands (by agrement between the clinics), New zealand and UK (for women aged <40 years).

Barlow states that in the UK the pressure for 2ET came first in 2001 with an HFEA requirement that more than two embryos may only be transferred in exceptional circumstances. In 2004 the Code of Practice was revised to state that in women aged <40 years the maximum was to be 2ET whereas women aged >39 years could have a maximum of 3ET (HFEA, 2004) This change coincided with the publication of the National Institute for Clinical Excellence Clinical Guideline (NICE, 2004) which recommended a maximum of 2ET for state-

[38] Klonoff-Cohen, H. 2005:180-204

[39] Golombok, Brewaeys, Giavazzi, Guerra, MacCallum, Rust, 2002: 830-840

[40] Barlow, David H. , 2005:1-3

funded IVF, and since the upper age limit recomended for NHS IVF was 39 years the two documents coinced in their recommendation.

Barlow also underlines the fact that in 2003 the Swedish National Board of Health and Welfare declared that all IVF in Sweden would involve SET unless prognosis was poor (Saldeen and Sundström, 2005) The Belgian approach appears to recognize the need for a degree of flexibility in the model of practice that will be attractive to many since it is stratified by age and also by cycle number, so that lack of success enables an increase in the number of embryos to be transferred. It is also very important to underline that the state allows funding for six cycles in a lifetime.

Single Embryo Transfer (SET) to prevent multiple pregnancies (MP) after IVF/ICSI. According to the researches, the incidences of MP (Twins and higher order pregnancies) after IVF/ICSI is much higher (~30%) than after natural conception (~1%).[41] Approximately half of all the neonates are multiples. Clinical trials have shown that programmes with >50% of SET maintain high overall ongoing pregnancy rates while reducing the MP rate to <10%. Experience with SET remains largely European althogh the need to reduce MP is accepted worldwide. Embryo selection is performed using one or a combination of embryo characteristics.

Due to increased maternal and fetal risks, there is a strong opinion in favor of single embryo transfer (SET) in order to reduce the high multiple pregnancy rate after IVF. Swedish SET legislation had no negative consequences for the couples.[42] On the contrary, the lower rate of twinning is expected to reduce the severity and rate of pregnancy complications after IVF.

Equitable utilization of the resources is a very important thing when it comes to the ethical issues. Cultural diversity and human interaction at all levels play an important role in the establishment and application of the ethics. Last 50 years to meet the rapidly growing demands for food water, timber, fiber and fuel. We live in a world of wars and difficulties, urban and rural controversies, still we have some hope for some peace in future. Whereas 40 young people commit to suicide in every 5 minutes, child / youth friendly services increase in each society. But the new consumption society and marketing for kids have an enormous effect on the society. In respect to national and religious problems, stemming from the identity and ethnic problems, the policy makers know who that child will be(come), but not the parents.

[41] Gerris, Jan M.R., 2005: 105-121

[42] Saldeen & Sundström, 2005: 4-8

3.2. Advertising, Marketing, Health Issues and Ethics

It is important to note that all the medical products and services in Turkey are banned to be advertised, unlike some other countries. The ones advertised or taking place in the media could only do so, putting themselves into a very different context. In this case, the creativity and the contextualization of a product or service plays an important role. For example, a very famous movie star is shown to have an eye operation to get rid of the eye glasses and the audience could also see the name of the hospital and if lucky enough the doctor could also be interviewed about the health of the star. These pseudo-contexts are created in such a way that, the audience cares more about the star and they ask for more information and later on a talk-interview, etc. And no doubt the media give them enough contexts to bring the issues in the most pleasant way as to guide the audience. No one can deny the importance of the media on the health issues as an initiative and motivation to act.

The Broadcasting Law in Turkey and many other international agreements prevent the advertisements on health sector and medicine. (The European Convention on Transfrontier Television, European Institute for the Media – EIM, European Platform of Regulatory Authorities – EPRA, European Television and Film Forum, The Network of Regulatiory Authorities in Mediterranean Countries, Audio-Visual EUREKA, European Auidiovisual Observatiory, Institute of European Media Law, First World Summit of Audio Visual Regulatory Authorities and Steering Committee on the Mass Media-CDMM).

RTUK (The Higher Council Of the Turkish Radio Television), regulations provide sentences of fine for the banned advertisements and upon their repetition, they could even provide sentence of banning broadcasting up to three days or sometimes more depending upon the type of the case and the related media. To give an example, they had a total of 45 billion Turkish Liras fine in cash in 2003 and 70 billion TL in 2004. This application is expected to give the media some kind of power to control the things broadcasted or published reminding them that it's somehow their responsibility to control it as well. But the media rejects this kind of a control mechanism to consider if the ad is appropriate or not. Because it is really a very complicated matter dealing with the Ministry of Agriculture, Ministry of Health and Ministry responsible from Family, etc. but the law part and the applications of the law of the discussion is not the content of this paper but another research.

Referring to the topic of marketing and ethics, there could be so many different points to be discussed. Marketing ethics could be defined as the study of moral values, types of attitudes and rules of marketing decisions and activities. [43] There

[43] Anusorn, 1990:4

could be several basic approaches such as teleological, deonotogical and relativist approaches.[44]

4. A Case Study: Medical Park Hospital - A Campaign for the IVF Couples and Ethics

By the end of the 2003, an interesting campaign took place in Turkey, Istanbul. It was a campaign for the IVF Couples offering them a decrease in the IVF treatments up to 45 %. The only thing they should do was just to go and talk to the doctors of the related institute and to get some more information about their case. The campaign was ended in January 24th 2004, with a great lottery drawn by the notary in Hilton Hotel to choose the couples to be treated. The campaign created such an environment that it is still under discussion whether it was an advertising campaign or not. Although from the very beginning, it was supported by the state people of various levels, the present law does not approve of it as an ad. The issue is still in the court involving not only the health institution but also the media giving place to the news and ads regarding the campaign.

Looking at the materials, it could be very difficult to understand if it is just a very innocent picture of a mother and a little baby or a wise application of advertising strategy to catch the attention of the parents-to-be. Thousands of posters of such kind were distributed among the applied couples. Without the name and address of the hospital, these could seem to be very innocent but, with the other information added, it could mean more than a mere innocent poster. The campaign has many different issues to be discussed in many different ways. This campaign was an important one regarding the following aspects:

1. ***Having a Brand:*** The Private Health Institutions in Turkey are getting much more importance than the state ones. The state ones are generally known to have the experienced doctors but unsatisfactory working conditions and physical surroundings. When the patients need a health service, they would like to have it in the best qualified way if they have enough income. Just because of the marketing requirements, sometimes, it is not the money but the brand name for the patients. i.e. having an operation in an x hospital means to be a very prestigious person caring for his/her health and paying a lot when it is necessary. (American Hospital, German Hospital, International Hospital, etc.) But anyone knows that the same operation could be possible in another hospital for a 1/3 of what has been paid. When it comes to have a baby, (for a life-time warranty) people were tend to go to the brand names believing that they have the quality and all kinds of security, safety, secrecy and confidence. The IVF babies are proved to be healthier than the other babies since they are controlled at every step considering any kind of a possible risk. Since both parts, the father and the

[44] Odabaşı & Oyman, 2001:433

mother hade some medication to reach to a certain potential ovulation before the pregnancy, the increased numbers of the ovulation and sperms could carry the increased numbers of the anomalies as well. (Reducing these anomalies or not is another ethical question and should be dealt with separately) Or it could be the anomalies deriving from the late age of the women causing genetic deviances in their babies. In fact, the doctors agree that there could be anomalies even for the IVF babies not because of the misapplications, or the unsatisfactory conditions but because of the risk factor the parents already carry.

2. ***A New Center:*** Alongside the 30 IVF centers in Istanbul opened up in the last five years, The Health Institution, chosen to be presented as the case in this paper, namely The Medical Park Hospital, was one of the brand new ones in Istanbul, which was opened under a new name in 2004 as a new hospital having an increased capacity for the IVF technology. The Advertisements in question, in fact, were not in the way to make it better known or to establish a kind of corporate image of the hospital. The ads mainly emphasized the importance of having a child, with the message that technology permitting, anyone could have a child and with their experienced doctors in the field they are ready to help to the couples in their treatment process.

3. ***Capacity:*** The Health Institution having this campaign was one of those proved its efficiency and quality throughout the recent years having about 300 cases each year for IVF treatments section. Through this experience the institution and the practicing staff had many incidences showing them different types of people having the same problem. To them, there were patients who could never have babies, there were the ones who could have a baby through various infertilization treatment techniques, some of those could afford to it and some of them could not. In that case, the patients were to suffer not only due to their health problems but economical problems as well. The doctors were to suffer too, since the patients talk to them not only share their health problems but also discuss the possible discounts of such an application. Each couple, having a unique situation, a different probability of having a baby and different economical conditions were forcing the doctors to choose the ones to be helped but the main criteria was to define an (s)election criteria which was really very difficult. There should be some other ways of handling this situation and an objective source of power should be doing this selection process they thought.

4. ***The Campaign and Its Multiple Faces:*** Looking at it in that way, the campaign could be seen in different ways.

a. On one hand, it was aiming to inform people about the IVF techniques, their use and results, thus, it had an education and information aspect.

i. Most of the people in the street learned that it could be not only the women's problem as it's been attributed to in the most conservative and uneducated parts of the society but also the men could be problematic.

ii. Through the pictures and explanations, the ordinary people also learned how the babies happen in normal circumstances and what kind of IVF techniques were possible.

iii. The couples learned that it's also a matter of age, not really very important for the men but for the women. Thus the precautions should be taken if the women are above 29, since they have 70% chance of having an IVF baby before the age of 29 but this chance drops into 20 % when the ages goes up to 40's.

b. On the other hand, it had a very unique communication strategy. In communication it is important to know the participants and the circumstances to establish a good rapport with the involving parts. When we look at the campaign procedure, we see that many communication strategies were used to reach the success.

i. The doctors giving information to the people through the seminars and public talks were practicing face to face communication and public communication. It was important for the society to have such a situation because these kinds of problems are usually kept as a secret within the family and they are not talked or shared with the strangers. This communication strategy of the hospital is believed to build a trust between the healthcare people and the patients as well as between the couples and the society. Seeing that there are a number of people sharing the same problem and looking for similar ways of solutions the couples had a kind of relief and self-confidence.

ii. Apart from this public communication, there was an intimate communication between the couple and the doctor requiring to handle this delicate issue with care. Each couple requiring an exam, were provided a doctor to talk to them individually. This attempt has many outcomes:

- It could be the case that for years the individuals (the husband and the wife) were blaming themselves or each other for such a failure. Regarding the children issues and the wide range of value system it represents such as the honour, status and position in the society, capability and the representation of being a family, the couples in general are very reluctant to share such topics with the strangers even with the doctors.
- This intimate communication, interpersonal communication gives trust to the couple and the individuals and learning that they are not the only people having such problems helps them a lot to get rid of their negative feelings and to look for some solution processes. In a way, they become more open to new

information, new technology and applications. They became more courageous for the applications and future developments.

- Otherwise, for the reasons stemming from shyness or religious feelings they expect something happen into their lives as a miracle. Through this intimate conversation with the doctor, the couple in a way gets a face to face education regarding their situation, the percentage of their hope and the possible applications. This relief is also something positive especially on the side of the mother-to-be, since the psychological mood of the woman plays an important role in this process.
- The doctor-patient communication gets more importance in such a situation, depending upon the couple, the doctors play the role of a mediator and negotiator, enlightening the patients and giving information about their situation and process in the best way they could grasp. Some of them understand verbal messages, some non-verbal, and yet some visual messages. The doctors' success to apply the most efficient communication strategy at this stage also effects the success of the whole process.
- The doctor-patient communication plays an important role not only from the point of view of the health issues but the general roles of the women and men in society, the expectations and functions, etc. Mentioning that the applicants were from rural regions 15-20 % who were in real need of such talks clarifies the importance of such a communication. Coming from a very closed circle, having access to less material and information they were ready to give more to their future children. After all, such a psychological support from the doctor, before, during and after the treatment mean a lot for the couple. In some cases, it is not always the good news that the doctor gives, perhaps s/he'll say that it's impossible to have a child and instead it could be a better idea to adopt one, etc. Even at this point, the way it's been said has a crucial importance.

iii. Coming to the communication taking place in the media, it was the application of the mass communication. The campaign created a real agenda. The topics carried up to the public discussion usually belong to the social or political agenda. But this time, it was a health issue and it was referring to many people secretly sharing the same problem.

iv. There were also communication strategies apart from all these, when we consider the patients reaching to the doctors and information sources via internet and e-mails to take place in a virtual communication environment providing them a sense of security and anonymity.

v. The communication between the couple and an IVF center usually appears very late due to the problems of access and information. Usually the couple prefers to wait for something to happen for a long time; later on they decide to visit a doctor -usually a gynecologist- and the doctor gives them many tests, taking so much time and energy and of course money on the side of the

couple. Then, perhaps another doctor, means another hope for a baby. Usually, the doctors do not want to loose their patients and that's why they do not want to send their patients to IVF centers. But in fact what the gynecologists could provide are not equal to IVF centers. This campaign helped the people to establish a direct and open rapport with the IVF centers at a very early point which was very crucial for the success.

c. From one point of view the campaign was a successful PR application of the institution. All the members of the institution were known by public and their explanations were accepted as the sound of authority. The corporate image of the institution gained more importance all of a sudden.

d. From a different point of view it was an advertising campaign of a different type since at the same time many values were advertised.

i. It was an advertising campaign, yet, this time the product promoted was somewhat different: a baby. It was a very valuable product for the society, it was a very delicate issue for some who were planning to have one but could not very easily.

ii. It was an advertising campaign, the health institution having a name for IVF was believed to have a high technology institution and thus, all the other branches of the health center benefited from such a campaign. There was a 25 % increase in the number of the patients.

iii. It was an advertising campaign of the IVF technology. Most of the people in the country, either due to the social pressure on them or due to the lack of education in such topics, or their lack of confidence and reluctance to reach to these topics were unaware of the new technologies and how valuable their results could be. With a very simple calculation in Istanbul, there lives 17 million people and if we think that 1/5 of the whole population having infertilization problem should be taken into consideration, there the numbers appears to be at least 3 million couples. Regarding this number as a basis, the doctors in this field believe that only the city Istanbul has a 8000 potential IVF treatment capacity waiting for an initiation. Each of these could require at least one or up to three cycles. That means, this advertising campaign has a great targeted audience, perhaps could not be seen in the way of the other products but a rather more valuable, more stable and willing audience, ready to hear more, ready to act.

iv. The advertising campaign of the IVF technology helped the people in different ways. For example, just a few years ago, for the state health insurance owners, it was impossible to have a payment regarding this type of treatment. Recently with the effects of the privatizing policies of the governments, the state hospitals could have the technology soon and also the patients could be sent to the private hospitals and still be paid by the state hospitals and state insurance

services. This was quite a change in the health policy of the state. Recently, the state also supported the IVF techniques on condition that the couple is proven by the medical reports that they could not have a baby under normal circumstances except IVF treatment. In that case, the health insurance pays a part of the treatment expenses (1.200 billion YTL) and 80 % of the medical expenses.

5. ***Club:*** If we look at the case as an advertising campaign, the first step was just to inform the people on the developments of the field, the second step was to create the demand and the last step was to serve them successfully. The ethical issue here was the advertising procedure. It could not be an advertising campaign since it was strictly forbidden. That's why they established a (pseudo) 'health club' and designed the campaign in this way. It was the health club calling the people to join. This metaphor of the 'club' reminds us the 'camp' again. This kind of a communicative environment could be accepted as 'a new camp' for the infertile couples, enlarging their circle of communication and helping them to gain more self-confidence. Actually, it was a club for the people having infertility problems. It was a new society for them to have new acquaintances and possible communication environments. The couples were as ready to join to the club as any other enjoyable club gives a party for them. In such a club, they were offered a place, they were given a chance and they were socialized. Even if they could not win the lottery they had many friends and experiences through this gatherings.

6. ***Informative:*** The Campaign was concentrating on the educational process rather than the marketing strategy of the IVF. Looking at the ads, no one could blame the hospital as to give advertisements, since most of their publications were just the information booklets. There were no promises, no comparisons or marketing in any of those. But, in fact, their impact on the society was much more than an ordinary advertising campaign. The campaign aimed mainly to give information about the reasons of infertility and possible treatment techniques. Most of the people came to the hospital to join into the seminars providing information on the applications. The couples were looking for some ways of solving their problems and most of them were ready for any kind of treatment just to have a baby. In some cases, it was not only the couple but the whole family joining into the sessions. These seminars were helpful, just to create an atmosphere for the couples to share their problems with the others, to see the others having the same and/or similar problems and to hope for better for the future.

7. ***Stars:*** Very famous people took part in it such as one of the main television speakers (Esra Ceyhan) took part in it. The famous, cheerful presenter of the women programs acted as a smiling nurse giving a newborn baby to the potential mothers / families. The state minister responsible from women and the

family issues, Güldal Akşit, also took part in the campaign giving interviews on the importance of having healthy children and supporting the new technologies. She also emphasized how important it is to be a mother, an educated mother, a modern mother. All the press meetings of her were full of children sometimes smiling to her sometimes crying as she wants to have a picture. Thus, every meeting was having an 'importance' as a popular piece of news. The third and the most important person was the public authority of the society known as the "grand-daddy earthquake", Prof. Ahmet Mete Isikara, the one known as to give explanations about health issues, a very lively figure for the children and the youth as well as the adults. One other person to be cited is the ex-chairman of the Religious Affairs, Süleyman Ateş. Many known doctors were also involved in the briefings and radio-television programs.

8. ***Media Planning Strategy:*** The ads took place in all over the media, television, radio and newspapers. It mainly targeted the big city, Istanbul. Open air ads and billboards were all over the city. Yet, the people in demand were not only from Istanbul and even more from the other cities (20-30 %). Most of the television programs, not only the news programs but also the women programs and talk shows paid specific attention to the issue. The stars and the programs of the high rating types helped the issue to be in the public agenda for a certain time. People from the many different levels of the society brought into the live programs to discuss the possibility of having an IVF child. The ones having a high potential were strongly recommended to have it immediately by the doctors joining the conversation.

9. ***Public Interest:*** The campaign gained a lot of interest: people came to visit the hospital, to get some more information about the IVF techniques, to see the doctors, even to see the pictures of the newborn IVF babies. A team of 13 doctors worked more than 7 months to meet the couples continuously, reaching up to the numbers of 3000 in a month. It should also be mentioned an additional on-line patients of about 2500, reaching to the doctors via on-line services and e-mails.

10. ***Selection Criteria:*** The couples applying for the IVF treatments were controlled in general terms to decide whether it is feasible or not. This was called to be the controlling and advising period. Only the affirmative ones were allowed to apply for the IVF treatment and these were given the chance of attending to the lottery as well. Approximately 6000 couples applied for the treatment but only 4180 were proved to be qualified for the treatment and included into the lottery.

11. ***Lottery:*** There were so many applications. After the general examination the couples proving to be the possible parents through IVF were given a number of application. Due to the limitations of the application, time and space, and high cost of the applications, only 500 couples were decided to be

given the chance of having a reduction during their first cycle. The lottery day was an important one for the health institution and for the applied couples. It's been open to public, in front of the notary, in one of the well known hotels. (Hilton) The stories of the participants, their pictures, the winners and the losers were on the press for many days.

12. ***Ethics:*** Considering the ones to be accepted as the lottery families, there were no discrimination regarding the economical aspects, age / gender factors or the possible success of the IVF technique for that specific couple. The hospital did not concentrate primarily on the success of the cycles or the number of the live births. The main aim was just to give them a chance to make their wishes true and to try their chances. As a result 500 families had the opportunity of 45 % discount for their treatment and 20 families were accepted free, without payment. Apart from the winners, the extra 150 couples applied to be treated on the normal price just to be included into the same process.

5. Concluding Remarks

As it's been mentioned before, ethics, communication and the values play an important role in the society[45] and Diken asks such questions[46]: Can there be an ethics of the camp that can regulate the conduct of "insiders" and "outsiders", or is the precondition of an ethical stance a commonality that has vanished with the genaralization of the camp? As shown by the example that the particularistic ethics promoted by the camp do not provide consistent answers to such questions. Ethics in other words, remains as one of the most problematical aspects regarding the generalizations of the camp. As Arendt states when human rights were most downtrodden another right announced itself, the right to have right.[47] This newly discovered right was not a civil right and barely a juridically defined right. It did not and still does not belong to the family of rights (the celebrated political, social and economical rights) for it is what conditions them, and as such this 'right' necessarily resists the very language of rights.[48] When looked at the issue in this way, production of IVF babies create a kind of grouping in the society differentiating between the 'insiders' and 'outsider'. Furthermore, the right to have a baby could turn to be the right to buy the facilities and treatments required.

Regarding the advertising issues on IVF children, there seems to be some problems today but there will be more problems in future. For example, private

[45] Gill, 2004:41

[46] Diken, 2005: 168

[47] Arendt, 1973: 296-297

[48] Hamacher, 2004:353

hospitals could pay about $10.000 for a half page advertisement on the Mother's Day, referring to their monthly or yearly meetings of IVF mothers. The message seems to be only an intimate celebration of the mothers who already have their babies, yet, it has perhaps more meaning for the females looking forward to becoming mothers in future, and in fact this group is the real target audience.

The economical side of the issue does not seem to be more problematic as it first occurred a few years ago. Considering the low income families, today there are a number of opportunities such as a certain amount of support from the government, and even some banks provide credits to make them happy and fertile even decreased dues debted in the form of monthly payments to the credit cards. Although the general regulation prevent the advertisement for the health sector, there are different opportunities for the advertisements of IVF babies, the doctors and the medical people believe that the most influential advertisement is a successful case. The appearances of the doctors and the medical people on TV programs as the trusted references is one of the most common cases. Sometimes, it is a piece of happy news in the corner of the newspaper to challenge all the other families.

Regardless of the topic, accessibility, popularity and the other effects of the media chain should show all its impact in a certain time limit. Time factors are as important as the economical, political, social, geographical scope of the concessions; the concessionaires are, after all, attempting to realize, over a considerable period of time, profitable returns on the investments made by them. Accordingly, all of the concessions run from one to ten years through the main products or related concepts and products. However, the policy concerning the duration of the up-to-date applications might undergone a major change in the new technology and communication era. The concessors than, have certain expectations requiring the motivation and mobility of the masses through the ads convincing them the popularity and acceptability of the IVF technology to lead higher rates.

There is a great tendency to assume that there is a symmetrical relationship between the new applications of IVF technology and having an experience with each new way having higher status, power, responsibility, and so forth. The infertile people lacking children are considered to be stagnating and usually excluded from the society, yet, they are included into a different society with the people having similar experiences and accommodated at a different level of the society, establishing a different group, having a shared agenda. In a way, in order to keep up with the balance, the individuals are forced to go with the stream and go for each new possibility. This might cause a kind of coercive power (power that derives from ability to remove another's actual choices or perceptions that choices are available. Power that derives from force or the threat of force.) All these factors and messages establish a kind of "metacommunication" rather than the usual social communication.

Considering the information got through this metacommunication, namely the ads, news and personal experiences of 'watching the same film', it's all "hush-hush". It's just a type of communication on a certain type of communication. As in the lines of Diken & Laustsen (Diken & Laustsen, 2001) there is a rule of the club: "You do not speak about it" but rather treat this knowledge as a secret that unites the members of the smaller prestigious society. Because ".....if information becomes all too obvious, its attraction would disappear". If there is a piece of information you get by the grapevine, it is whispered into your ear with the understanding that you will not pass it on to the others. You feel honored and excited. You are one of the special few to get this information. You cannot wait. You must quickly find other ears to pour the information into! And so the information, secret as it is, begins to spread – nobody knows how far! At the end it's all the part of the metacommunication but not the communication itself!

Everyday, the newspapers, the television channels introduce us new films showing the most challenging scenes in them and giving information about the actors/actresses taking part in those. They even comment on them by giving them stars, advising the most attractive ones to an unknown audience. For example, in the last two or three years, many television serials took their themes from IVF babies or from the infertile couples. They even put a character of carrier mother into one of the leading ones. Would you like to be one of them? Do the comments appeal to you? Do you get the same aesthetic pleasure as the others in the group? How far! What could be the problems to be faced? These serials are just the reflections of the real life-situations into the media coverage.

People like to be some part of the mysteries and myths. That's why they create myths or contribute to the created ones. At this point, we may consider all the information and the ads and metacommunication of the films as a type of myth creation. And people would like to be part of it through either talking about it or buying objects related to the film themes or actors/actresses.

Each media type has its own impact on the audience. In the case we handled in different ways, the event could be seen in different ways through several different glasses each having a different view of the same thing. The advertising process could be considered as unethical, or the showing up a number of doctors may be considered unethical, but at the end the campaign and its effects could be considered very valuable and ethical. The argument brought here is that the situations and the social events could have different faces. This multifaced concept underlying the whole assesment and the evaluation process of the ethics regarded in different ways in different societies.

Considering all these, having a baby, could be accepted as one of the basic rights. The right to have a baby is considered as another right. Who's going to have a baby and what is the cost for it would be discussed more and more as the

new technological and genetical developments occur and as their reflections in different societies find a way to appear.

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Television Dream World: Woman Variety Shows and Dream to Be A Winner: Case Study of In Vitro Fertilized Children

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1. Introduction

As Martin Esslin states "we have all seen it a hundred times, and in dozens of variations: that short sequence of images in which a husband expresses disappointment and distress at his wife's inability to provide him with a decent cup of coffee and seems inclined to seek a better tasting potion outside the home, perhaps even on the bosom of another lady; the anxious consultation, which ensues, between the wife and her mother or an experienced and trusted friend, who counsels the use of another brand of coffee; and finally the idyllic tableau of the husband astonished and surprised by the excellence of his wife's new coffee, demanding a second- or even a third!- cup of the miraculously effective product."[1]

Yes it is a television commercial. A commercial from a view of men's world.

The coffee commercial is about fifty seconds in length and it does not contain any perspective of a female life. Actually, it does. Women are serving to men.

Obviously, the example we have, a television commercial, is not the only television program type which stereotypes women. There are also television news, live programs, variety shows framing women in similar ways. Women in secondary roles or women in need are also common uses in these program types. They do not focus on any particular subject or content, but women in defined ways. That is why, women are usually portrayed from a traditional perspective. These programs, unfortunately, seem not to have any positive input to women's issues and they still serve to male discourse while having the traditional perspective to women and women's issues.

Portraying women and women's issues by media defines the role of women in media's terms. Media, especially television, portray women as housewives, people in need, victims,

[1] Eslin, Martin. Aristotle and the Advertisers: The Television Commercial Considered as a Form of Drama. The Kenyon Review, 1, 4, Fall, 1979.

mothers, and in similar roles. Some television programs pretend to reflect the need for improving conditions for women while some others use women as part of problematic issues.

Television provides great opportunity to viewers. Starting from 10 o'clock in the morning till almost 6 o'clock in the evening, there are television shows, discussion programs, talk programs concerning and involving women. These programs can be considered as women's programs just because those time slots belong to women working at home who are capable to watch while working. Mainly, these programs include musical performances, discussions on certain topics, daily cooking advices, health issues and others. They seem to have educational background but in reality they do not.

Programs concerning and/or involving women are like collage structures. A bit of this, a bit of that. As mentioned earlier, health issues, child care, current fashion, beauty, trends, pregnancy, cooking are part of this collage. All these for determining the women's role in a subliminal way through television programs which all serve to male perspective.

Some programs accept call-ins. Women can dial programs and can easily talk to the presenters of programs or shows. They can openly speak about their problems and not only share with the presenter but also with participants of the show from the public and the general audiences who watches those shows. Women's problems become everyone's problems and 'in the arena' they have to be analyzed, discusses and somehow solved by all members of the show and the audience. Supposedly, assistance to those women are carried through those shows while men at work and not present at home.

In terms of categorization of these women's programs, there can be two main distinctions. One group is consisted of celebrities, special guests, music and audience in the studio with a famous female presenter. These presenters are actually singers. This type of women's program take place in the mornings, from 10 o'clock to 12 in the noon. The second group is consisted of women with problems (family problems, health problems, economic problems, children problems, and others) and a presenter who is famous in women's programs control the whole show. They accept call-ins from family members, beating husbands, family members and from the audience in the studio. These programs take place 2 in the afternoon till 6 in the evening. These kinds of women's programs seem to have more serious content-based structure. But, is it really like this? It really needs to be questioned.

The second type of women's programs have a tendency to create a feeling of security and problem-solving abilities for women in need and women with problems. Women in these problems think that they are able to solve their problems in front of everyone; their problem become shareable with audience members and women as a subject takes place in the center. The ones who are not able to confront to their families or to their husbands feel very strong and outspokenly express every feeling they have. It is a simulation of being strong. In those programs, women seem to be ruling the men but they again actually serve for male interest. Those programs, today, are no longer for women but also for men.

Women's programs tell its female viewers and its female participants that they will be happy and their problems will be solved. They just need to be seated in the right spot which is the show itself. Women can throw their ideas, hates, disappointments and many other things in these shows. They are arenas for confrontation and one more time women feel more powerful in these programs compare to their home. The presenter, with a strong stable voice, controls the moves and gives chance to people to speak in order. Not only for the sake of free flow of opinions, but the ratings. They need rhythmic climax as any film does in their programs for attracting viewers.

Money Matters

In Turkey, women's programs are in their golden era. Everyone talks about them and the women they place in front of our eyes somehow catch our attention. They do not select ordinary women, but women with incredibly problematic stories. Media Watch Center (Medya Takip Merkezi- MTM), in their last year's report in December, pointed out the importance of these programs not only for their unique content characteristics but also for their ratings capabilities and marketing possibilities. For example, Kadının Sesi (Woman's Voice) at Kanal D reflects the highest ratings numbers and it also has great number of marketing and advertising examples.

Besides 'Prime-Time' period of television broadcasting, women's programs are the second in attracting advertising. The distribution for advertising sahre in each television station's women's programs is (December 2004):[2]

- TGRT (conservative): 33 %
- Kanal D (liberal): 22 %
- Kanal 7 (conservative-religious): 18 %
- ATV (liberal): 16 %
- Show TV (liberal) 11 %

Besides the advertising revenues of these programs, the advertisements are consisted of cleaning products, home equipment, food products, cooking devices, children's, aesthetic-cosmethics and make up products, health products, banks; and interestingly newspapers and mobile phones. The amount of money spent on these advertisements is approximately 35 million dollars in each month.

Women's programs tell general audience that women have to be enlightened and these programs are the appropriate means for this purpose. The language, 'beautiful', 'chic' presenters use, underlines the need for help to those disadvantaged women. The way they

[2] Medya Takip Merkezi, Aralık 2004, **Medya Takip Raporu.**

question women and their family members is very strong and direct. The language and the way presenters address to women can be reflected with some examples:

To the husband or father of the women- or to women directly, presenter:

'Do not do it like this'

'Why did you do like this?'

'Don't you have your own brain?'

'Why did you tolerate this?'

Women's television programs is kind of an answer to the need of planning women's time at home. A long hours of work or presence at home and every member of the family is either at school or at work. She is home alone. Her loneliness is taken away from herself by these programs. Programs talk about similar problems of her and the more people talk about those problems, she thinks that she is doing a productive job by watching these programs. Daily newspapers put more value on her effort for watching women's programs. Subjects of those programs have high possibility to be covered next day's newspapers after their appearance on television. The more women watch other women's pains and disappointment they feel relieved. They think they could have been much worse when they compare themselves with program's subject.

2. Cause and Effect?

As mentioned earlier, there are many women's programs on television and they are all, supposedly, trying to discuss and find solutions for women's problems. This 'sincere' idea has to meet with the rest of the family members which women also belongs to. Men, children, uncles, aunts or other people may seem to be willing to join these programs for solving problems, but at some moments the opposite may happen. As it happened once with a 'good cause', but with a 'bad effect'. We have to keep in mind that women participating these programs are generally from rural areas and poor background.

Here is the cause and effect. 33 year old Birgul Isik applies to 'Woman's Voice', presented by Yasemin Bozkurt, and gets accepted to program. She talks about the problems in the family and complains about husband's beatings. Couple days later, when she goes back to home, while waiting at the bus station, her, 14 years old, younger son waiting at the station comes and tells her that 'she put a blame on whole family' and he fires at her.

Since then, it has become a big discussion of the role of women's programs. Birgul Isik's death is one of the milestones in women's programs. Some television stations decided to ban similar programs they have. And some other stations changed the formats of their own.

Victim; Birgul Isik

Aysenur Yazici's 'You are not Alone' (Yalniz Degilsin) at ATV was taken off the air after Birgul Isik incident. Aysenur Yazici were noticed about the decision of the station administration during live show. She protested the decision while crying in the live show. In relation to these developments, presenter of In Between Us with Serap Ezgu (Serap Ozgu ile Biz Bize) stated that the problem was not about program makers but with the mentality of the society.

Aysenur Yazici, 'You are not Alone'

Serap Ezgu, 'In Between Us with Serap Ezgu'

The center of these discussions, women's programs, has rich program elements according to selected topics for program makers. They vary from rape victims to rapists, beaten wives to lost family members. Tear drops and smiling faces; hate and love are all together in those programs. As Serap Ezgu states, every day life is reconstructed in the studio, not in a fictive way, but in reality in front of everyone's eyes.

There is also another strange face of women's programs. Program participants from the general audience are consisted of women and these women are collected from neighborhoods by group leaders. It is interesting that these participants pay 3 New Turkish Liras (approximately 2 US Dollars) to become participants of a particular show. They come to studios with rental buses and they come from all over Turkey to see and witness the discussions and celebrities or show presenters. Program makers do not use famous people; they prefer to reflect the 'major' problems of ordinary people, ordinary women. In half an hour, an ordinary person may become famous because of her problem and the next day newspapers cover the rest. Violence is not supported in these programs but it, unfortunately, gives the whole flavor. Here are some examples of this flavor according to dialogs:

Example 1:

Presenter: *What did you do when you found out that your wife had an affair?*

Man: *The man she was with was from the fifth floor…I took the bread knife and I was ready for a massive killing. I would sliced them. But, they did not open the door.*

Example 2:

Presenter: *How did he behave when he found out you had an affair with someone?*

Woman: *When I came home, his hand were behind him. I did not understand it at the beginning but he was holding a bottle of nitric acid. He threw to me. I was lucky, only my back was burnt.*

Example 3:

Presenter: *Why did you stab your wife?*

Man: *We were fighting.*

Presenter: *What did she do then?*

Man: *Well, she took off with my three kids and moved to a man with four kids. She is now pregnant from him.*

Audience member woman: *Man is right. That kind of a woman has to be stabbed.*

Women participating in these programs assume that they are doing something important. They are actually exposing themselves to public and they believe someone or some people will be able to solve their problems. It is like a simulation. The hand they are expecting from the public is nothing but hallucination.

The coverage of dense problems and conflicting family members in those programs and violent results became an apparent discussion debate in the public. RTUK (Radio and Television Higher Commission) even had its remarks on these programs. They declared that these programs were moving to a problematic direction.

One example in those series played in safe-shallow waters. They preferred exactly a different thing. A lottery to be a winner for families in need!

Dream to be A Winner: Case Study of In Vitro Fertilized Children

Esra Ceyhan, presenter of 'A to Z with Esra Ceyhan', at TV8 covered a subject of vitro fertilized children in her program at the end of year 2004. The whole show was constructed as 'to help families' but it was also promoting and marketing a private hospital.

The women's program was not the only piece in this construction. We can call it construction, because it meant to be like 'a film'. Heroes, problems, good guys and girls, poor and other necessary figures were involved in this whole show.

- The master; owner of call to adventure: Medical Park Hospital.
- The whole plan: In Vitro Fertilized Children Lottery.

- Mission has to be completed; a deadline: 22th of January and to call 212 491 1313.
- Lucky people: Couples with positive test results from the experts.
- Arena: Hilton hotel, Istanbul, January 24th.
- Cast: State Minister, responsible from Women and Family, Guldal Aksit; ex-chairman of Religious Affairs, Suleyman Ates; women's program presenter and producer, Esra Ceyhan; medical professors.

State Minister, Guldal Aksit

State Minister, Guldal Aksit and program maker and presenter, Esra Ceyhan

As a result, approximately 6000 couples apply for the lottery and only 4117 couples were qualified for the lottery. During the women's program, 'A to Z with Esra Ceyhan', the need for in vitro fertilization and its appropriateness according to Islam are covered. The first heroes are introduced in the program and in the whole show. They are the survivors of earthquake in 1999 and lost their two children in that earthquake. Famous earthquake scientific Prof. Ahmet Mete Isikara decides to help them and they also take part in this campaign. At the same time, famous female singer Muazzez Ersoy appears in the show for supporting. In the show, all these supportive ideas are covered and happy faces of family members are reflected. It is actually a subliminal way to say 'the need, the hospital, the option and the result!'

Esra Ceyhan, 'A to Z with Esra Ceyhan'

Esra Ceyhan describes this whole scene as a choice of agenda. She believes that their audience is from the whole sprectrum. Young, children, old, women, men

are part of this spectrum. Ceyhan believes that they express the feelings of those people. Topics and people are selected according to the agenda, she adds.[3]

This example is a pure switch from the previous exercises of women's programs. It is oriented in needs of people compare to conflicting problems of women. At the same time, it had a commercial value for many sides of this show business.

Television, in terms of its capability to attract people, reflects an opportunity for program makers to gain more ratings while promoting commercial brands, such as Medical Park Hospital. From an ethical perspective, it is controversial to have a lottery for a need of people in health issue. Meanwhile, it is profitable to use all the cast member mentioned above for advertising the hotel while supposedly helping people out with the help of women's television program.

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[3] Ilgaz, I & Ucar, N. Kozlarını ve Dertlerini Ekranda Paylaşıyorlar. Milliyet, 20 Aralık 2004.

The Analysis of Using Crisis Communication Activities in Media and Bioethics Perspective Towards Avian Influenza (Bird Flu): a Content Analysis over Turkish Press

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Abstract

The Avian Influenza (Bird Flu) is one of the most important pandemic diseases that threaten world health. In Turkey, Bird Flu crisis first appeared on 7th October of 2005 morning in Kızıksa in Manyas Bird Paradise from which turkeys died due to bird flu and the area was taken under quarantine immediately. Like other countries; the media is still inalienable part of the crisis communication activities and impressing and shaping public opinion in Turkey. The aim of this article is to investigate the positions of actors who were the source of this news by content analysis technique considering news and columnist writings between 8th-29th October 2005. Thus the aim is to understand crisis communication positions of the government and private sector firms, which produce poultry folks during the Bird Flu pandemic disease. The other aim of this article is to unearth and analyze relationships between media and bioethics perspectives. Basic assumption of the study is that the most effective news resources in the press during the crisis in Turkey are the governmental institutions. According to results, the government on pres mainly managed crisis communication activities. This position gives rise to one-sided constructed news. From this point of view, the news is discussed related to media ethics and bioethics perspectives.

Key Words: *Pandemic disease, Avian Influenza (Bird Flu), press, crisis communication activities, media ethics, bioethics.*

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1. Introduction

There are many studies about crisis communication activities in public relations literature. For example; Marra (1998) indicates the importance of crisis communication plans, Burnett (1998) proposes a classification matrix which is composed of four crisis situations related criteria such as time pressure, control and threat level and response choices. Also Benoit (1997) discusses a theory which is about image renewal for understanding institutional crisis situations. The study of Penrose (2000) summarizes the studies of Littlejohn which are about 6 gradual crisis model, and Fink, Mitroff and Burnett and their approaches about the topic. Organizations which face crisis generally have to reply crisis immediately and tell the truth and furthermore especially convey information to their important institutions orderly (Kaufmann, 2001). In the literature there are several recent studies which indicate the importance of the Internet during the crisis times. For example, DiNardo (2002) assumes the Internet as an ideal means of communication in crisis times, Taylor and Perry (2005) emphasize the Iinternet as an important means in communication with journalists and public during the crisis term. Furthermore Greer and Moreland (2003) point that web sites provide important facilities for public relations and organizational communication experts. According to Greer and Moreland; websites help establish the communication of organizations' services to the public audiences, establish communication with the media easier and faster, and finally in critical situations provide replying capacity for the organizations.The article of Martin and Boynton (2005) is the source of reasoning in this study and investigates crises in relation to NASA faced with and how they were presented in four newspapers. When we consider all of these studies, we see that plans, models, the Internet and press are important during crisis times. As noted before, the media, especially press, is still inalienable part of the crisis communication activities and impresses and shapes public opinion in Turkey. Press accounts of issues in bioethics gain significance to the extent that the media influence public policy and inform personal decision making. The increasingly frequent appaerance of bioethics in the news thus imposes responsibilities on journalists and their sources (Goodman 1999). As Simonson (2002) notes, there is dissatisfaction with the media within the field of bioethics. Although the popular media has given bioethical issues considerable publicity over the past two decades, scholars in bioethics have often been uneasy with the coverage and worried about its inadequacies.

Methodology

The Purpose of the Research

The aim of this article is to analyze relationships between media and bioethics perspective by researching the positions of actors who were the source of the news during the Avian Influenza crisis.

The Methodology of the Research

During quarantine period, the news and articles published in daily newspapers such as Birgün, Hürriyet, Posta, Vatan, Cumhuriyet, Tercüman, Yeni Şafak and Milliyet that represent different views in Turkey, were scanned using content analyses. 258 news and 36 articles were analyzed. Thus to determine who are the persons and institutions manage Avian Influenza Crisis by means of press in Turkey in content analyses, a category which is about individuals and instutions as news resources was created. The category of individuals and institutions as news resources, there are goverment authorities; civil society organizations, chicken firms that were affected from crisis, international organizations and universities. All news resources used in a given news were separetly recorded on the section of each news resources.

2. Findings

According to research findings, in daily newspapers 258 news and 36 articles were published between 8th and 29th October about the topic. The Ministry of Agriculture and Village Affairs is one of the governmental institutions which gave the most abundant declarations with 58 news. This institution is followed by The Ministry of Health with 32 news, Governor with 21 news, Ministry of Environment and Forest with 7 news, Prime Minister with 6 news and Ministers with 3 news respectively.

Table 1. The Distiribution of Governmental Institutions in Press as a Source of News

	Ministry of Agriculture and Village Affairs	Ministry of Health	Governor	Ministery of Environment and Forest	Prime Minister	Ministers
Birgün	1	3	-	-	-	-
Hürriyet	6	6	2	2	1	1
Vatan	7	5	4	-	-	-
Posta	1	1	3	-	-	-
Cumhuriyet	13	5	2	-	1	1
Tercüman	12	4	1	2	2	-
Yeni Şafak	7	3	3	2	1	-
Milliyet	11	5	6	1	1	1

In Turkey, Civil Society Organizations are the second most referred news resource with 50 news. BESD-BİR (White Meat Producers and Breeders Association) comes first with 9 news. In the second order there is Turkish Veterinarians and Physicians Association with 5 news. The third order is shared by STBP (Healty Chicken Meat Platform), Clinical Microbiology and Infection Disease Association, Istanbul Physician Chamber, Istanbul Veterinarian Association, and Turkish Agriculture Chamber Association with 4 news. Other civil society organizations appeared in daily news with 16 news.

Table 2. The Distiribution of Civil Society Organizations in Press as a Source of News

	Turkish Veterinerian and Physician Association	**STBP (Healthy Chicken Meat Platform)**	**Clinical Microbiology & Infection Disease Association**	**Istanbul Physician Chamber**	**Istanbul Veterinarian Association**	**Turkish Agriculture Chamber Association**	**BESD-BİR White Meat Producers and Breeder Association**
Birgün	**1**	**-**	**1**	**1**	**-**	**-**	**-**
Hürriyet	**-**	**1**	**-**	**-**	**-**	**-**	**1**
Vatan	**1**	**1**	**1**	**1**	**1**	**-**	**-**
Posta	**-**	**-**	**-**	**-**	**-**	**2**	**2**
Cumhuriyet	**1**	**1**	**2**	**-**	**1**	**1**	**2**
Tercüman	**-**	**-**	**-**	**1**	**-**	**1**	**-**
Yeni Şafak	**1**	**-**	**-**	**1**	**1**	**-**	**3**
Milliyet	**1**	**1**	**-**	**-**	**1**	**-**	**1**

The opinions of Poultry Breeders Firms, which suffer from crisis, existed in 25 news as news source. The distribution of these 25 news by firms as follow; Şeker Piliç with 12 news, Banvit with 9 news, Beypiliç, Pınar, Keskinoğlu, Şenpiliç with 3 news, Karagüp, Bu Piliç, Vanet and Erpiliç with 2 news, Ömür Piliç, Gedik, Akdana, Kayseri Tavukçuluk, and Borlar Piliç with 1 news. When we look at the distrubution of news, Şeker Piliç and Banvit are not only the foreground firms in the news, but they are also the greates poultry breeder firms according to their annual giros. Shortly, economic power and effect area-which evolve depending on the economic power-of the firms, professional public relations and crisis communication studies find their response in press.

Table 3. The Distiribution of Chicken Firms in Press as a Source of News

	Şeker Piliç	Banvit	Beypiliç	Pınar	Keskinoğlu	Şen Piliç	Karagüp Piliç	Bu Piliç	Van Et	Er Piliç	Ömür Piliç
Birgün	-	-	1	-	-	-	-	-	-	-	-
Hürriyet	2	2	-	1	1	1	1	-	-	-	-
Vatan	3	2	-	-	-	-	-	1	-	-	-
Posta	-	1	1	-	-	-	-	-	-	-	-
Cumhuriyet	1	-	-	1	1	-	-	-	1	-	-
Tercüman	2	-	-	-	-	-	-	-	1	1	1
Yeni Şafak	2	2	1	-	1	1	-	-	-	1	-
Milliyet	2	2	-	1	-	1	1	1	-	-	-

	Gedik Piliç	Akdana Et Ürünleri	Kayseri Tavukçuluk	Borlar Piliç
Birgün	-	-	-	-
Hürriyet	-	-	-	-
Vatan	-	-	-	-
Posta	-	-	-	-
Cumhuriyet	-	-	-	-
Tercüman	-	-	-	-
Yeni Şafak	1	1	1	-
Milliyet	-	-	-	1

According to the newspapers with their explanations about the topic, international organizations come in the fourth place. Newspapers quoted EU authorities in 33 news, 16 news to WHO, 9 news to FAO, 4 news to OIE, 2 news to CDC and 1 news to UN explanations.

In crisis communication, negatiations between Turkey and EU gain importance. EU authorities' explanations become important in the newspapers because Turkey took important steps in the negotiations just before the Avian Influenza Crisis. Formerly, EU veterinerian authorities came to Turkey for investigation of six institutions and as a result of this investigation progress, they found these institutions suitable for the EU norms, and they said that if minor weaknesses were fixed then this sector could start exportation to EU. Thus, annualy an average of 20 thousand tons of white meat will be exported to EU and sector will be rescued from the recent crisis. The crisis prevented the developmental progress of the Poultry Breeders sector. Crisis not only decreased the meat consumption considerably, but also blocked the planned exportation. Due to that reasons, in crisis communication, most of the information and persuasion studies were directed to inner quotation, and the EU authorities' declerations were used as supports.

Table 4. The Distiribution of International Organizations in Press as a Source of News

	FAO	**EU**	**WHO**	**CDC**	**OIE**	**BM**
Birgün	**2**	**-**	**-**	**-**	**-**	**-**
Hürriyet	**1**	**8**	**4**	**1**	**-**	**-**
Vatan	**1**	**10**	**4**	**1**	**-**	**-**
Posta	**-**	**-**	**-**	**-**	**-**	**-**
Cumhuriyet	**2**	**4**	**3**	**-**	**1**	**-**
Tercüman	**1**	**4**	**1**	**-**	**-**	**1**
Yeni Şafak	**2**	**3**	**-**	**-**	**3**	**-**
Milliyet	**-**	**4**	**4**	**1**	**-**	**-**

Universities were in the fifth order with their declarations in the newspapers. When we consider the declarations of the universities, Istanbul University comes in the first order with 6 declarations as a news resource. Ege University is in the second order with 5 declerations. These universities are followed by Van 100.Yıl University, 19 Mayıs University and Ankara University with 2 declarations. Akdeniz, Celal Bayar, Çukurova and Erciyes Universities could declare their opinions in the media with only one news.

Table 5. The Distiribution of Universities in Press as a Source of News

	Univ. of İstanbul	**Univ. of Ege**	**Univ. of Akdeniz**	**Univ. of Celal Bayar**	**Univ. of Çukurova**	**Univ. of Van 100. Yıl**	**Univ.of Blacksea Technique**	**Univ. of 19 Mayıs**	**Univ. of Erciyes**	**Univ. of Ankara**
Birgün	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Hürriyet	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Vatan	**1**	**2**	**1**	**1**	**1**	**1**	**-**	**-**	**-**	**-**
Posta	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Cumhuriyet	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**1**	**1**	**-**
Tercüman	**1**	**1**	**-**	**-**	**-**	**-**	**1**	**-**	**-**	**1**
Yeni Şafak	**-**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Milliyet	**1**	**1**	**-**	**-**	**-**	**--**	**-**	**1**	**-**	**1**

Conclusion

The mass media are expected to play a key role in providing relevant and accurate information during a crisis (Riegert & Olsson, 2007). In crisis term the government and ministries are the main information resources when we consider the common results of content analysis made over the news resources. In other words, crisis communication was mainly managed by the government. The civil society organizations were the second important actor in this process. The Poultry Breeders Firms came barely after the Civil Society organizations. These rostrum and producers managed crisis with press advertisements. Members could overcome the crisis by coming together and taking collective action, and

since they have founded, they have made efforts to get international quality and security certificates and tried to find wright ways to communicate with public. Each firms informed public audience on their websites. Both rostrum and firms gave advertisement and posters were distributed to consumers and retail points. Each press' information request was replied by the poultry breeder firms. Veterinarian and other scientists gave correct information to public as ideal leaders in cooperation with the firms. In mark products; the message of "neither risk" was always repeated. The Prime Minister gave a message informing that eating chicken meat is safe with press members by eating chicken. Related to the topic; the similar message was given by EU observers who came Turkey to investigate the topic.

All of these facts show us that informing public audiance and related institutions in crisis communication literature is important. Advanced programs related to crises was designed to build up relationship with the shareholders. Especially, giving response to the consumer questions and problems by means of designed parts of the web pages indicates again two-way symmetrical crisis communication strategies. But unfortunately, as stated in this article, poultry breeder firms that were mainly affected by the crisis and their rostrum did not perform the same achievement in becoming news sources.

Individuals, organizations and society face difficult ethical choices in a number of areas that are frequent targets of news coverage: medicine and science, business, government, and law. In recent years, some of the most controversial subjects have emerged from medical research and practice (Craig 2002). News reports are inescapably shaped by choices made in the minds of journalists with a certain view of the world and certain blind spots (Craig 2002). This establishment is valid for pandemic disease news. The relationship between journalists and sources is often shaped by tradition and untested assumption (Goodman 1999). The dynamic of news stories in the media is that such claims have to be more than just "one-source" stories (Wilkie&Graham 1998). Communication is not simply a process of transmitting ideas and information, but it also a mode of ritually enacting the shared understandings of a group (Simonson 2002).

From bioethics perspectives current content of pandemic plans needs to be effectively and 'transparent decisions within a social consensus' (Katolik 2005). Certainly, media is the one of the most important bases on which to build this consensus. Both the mass media and public health authorities have the responsibility to deliver correct information to the public.

All public oriented publications related to epidemic diseases should be carried out in a conscious and balanced manner. When we think about the usage of news resources, which is one of the most important construct of news, sounds of different parts of the community should be included. Predominantly quoting to

the explanation of the Government in the published news and in columns related with Bird Flu destruct the claim of objectivity and democracy. The thoughts, approach, attitude and declerations of the news resources should be correctly expressed and this issue should be considered as one of the important factors in preparation of the news. In addition to that, giving place to the news resources of the universities, non-governmental organizations, poultry-selling firms and individuals who suffered from bird flu encourage the representativeness in a fairly way.

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The Ethical Criticism of Public Relations Management Under the Influence of Globalization: Public Relations Roles

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Abstract

As a result of their natures, multinational companies impose some restrictions to cultural and economic equality among countries within the context of nation-states. Various values including the philosophy of life are reproduced in accordance with globalization by such companies and institutions and such values are introduced to societies. Public relations launches certain strategies in order to make the global companies adapt themselves better to the areas they are functioning in and introduce their policies as well as to create a reciprocal dependency between the environment and the companies. Public relations suitable to the globalization ideology, on the other hand, may function within the activities that serve the consent formation in accordance with global ideology and the principle that no policies can be adopted without a national consent. This study is a critical determination of the situation pertaining to public relations practices under the influence of globalization. Thus, the social role or roles are assumed by the public relations agencies in globalization process have been analyzed with a questionnaire in this study. The corpus of the study consists of the public relations agencies that serve the multinational companies and that are also the members of the public relations associations in Istanbul, Ankara, Izmir and Bursa (the four biggest cities in Turkey). The questionnaire was sent to 95 public relations agencies and 16 of them replied it. The results cannot be generalized, but according to the findings, there seems to be a minor difference between the ratios of the adoption of advocacy and consultancy roles. This case

denotes that there is a thin line between the applications of symmetric and asymmetric models and the implementations as well as practices can be in both ways. Information provided to the external world focus on corporations and its achievements. The first three groups that are contacted most in the name of multi-national companies are media companies, universities and vocational associations. It is usually assumed that the most important role of public relations is the idealist social role and in the same way, the most important aim of public relations is to stimulate the consumption habit by creating a positive impression in the public about a company.

Keywords: *Globalization, ethics, public relations, PR models*

1. Introduction

By and large, the concept of globalization includes "the establishment and the development of the domination of economy-policy, culture and ideology of international capital over the administration in political sense as well as the administration policies, ideologies and cultures of societies" (Erdogan, 2002: 149). The most conspicuous form of globalization is the consumption culture. Global corporations and institutions re-produce the language and certain values judgments, including the habits, ways of thinking and the philosophies of life in the context of globalization and they also introduce the respective elements to the society. Emergence of global markets and the development of the global market concept have necessitated the division of international markets. The criteria used for this division are "the industrial structure, demographic aspects, technological infrastructure, geographical location, political and legal frames, personality, culture and lifestyle, attitudes and behavior, pleasures and beliefs" (Tenekecioglu, 2000: 134). Through the influence of the multinational companies (considered as the agents of consumption in this study), global capital increasingly stimulates societies, in which it is functioning towards consumption and consequently causing changes in the consumption habits, value judgments, cultural identities, almost in the whole lifestyle.

According to Morley (1998), the idea behind the multinational investments is that as long as the product, service and communication strategies are arranged to meet the local demands, a global success can be attained. Overall, the study is a critical analysis pertaining to the public relations activities under the influence of globalization. Therefore, which role or roles public relations agencies assume and which strategies they employ during the globalization process have been examined by implementing a questionnaire. The corpus of the study consists of the public relations agencies that serve the multinational companies and that are also the members of the public relations associations in Istanbul, Ankara, Izmir and Bursa. The questionnaire was sent to 95 public relations agencies by e-mail and three weeks later, control e-mails were also sent. Those who were in Istanbul were called up as well; however, only 16 participants replied the

questionnaire. The reasons for the low rate of return are that it is not unexpected to have few responses to surveys with the public relations professional sector in Turkey. Also some people criticized the survey questions; some said they did not have time. The researchers' one possible interpretation of the low rate of return is 'transparency' and that sharing information with the third parties is a process that requires time and approval of the others.

1.1. Globalization and the Means of Globalization

Globalization refers to global identities, roles and applications. If these conditions are convenient enough, the reliability of the given ideology increases. "With the introduction of the new regulations in the 1980s, it was aimed to end the theories of the Keynesian Economy and Prosperity School. The theories and practices derived from these theories were gradually put aside…Parallel to the abatement of the threat of Communism as well, the human dimension in economy totally disappeared. Thus, individuals simply turned to the means that serve economy, whereas economy stopped serving them" (Kazgan, 2000: 93).

Through globalization, international companies have been assuming colossal positions. The treaties among companies, their taking control of small companies and the monopolies created by privatization help them increase their dimension immensely…As a consequence of their ever increasing domination, the impositions for eliminating the authority and responsibility of nation-states in economy are continuing" (Kazgan, 2000: 157). Corporations get into interactions in order to establish a dependency. Consequently, the co-operative organization function of corporations emerges. Corporations assume several strategic methods to survive in accordance with the public opinion they create.

According to Geray (1997), as long as globalization is used in the sense of fast communication and free international markets as well as the capital movements for export purposes, it is not possible to observe any negative aspects. However, considering many countries in the world, it can be noticed that the concept of globalization is exercised as an "illusion used by the ruling or dominant classes to persuade" their peoples. Similarly, stressing the negative aspects of globalization, Manisalı (2002) explains the consequences of globalization as follows: "1. the shares of big companies and the powerful states they belong to are continuously expanding the world market, 2. certain consumption stereotypes are imposed and the local consumption stereotypes are substituted by the international ones, 3. Multinational companies initiate into the local commerce in the underdeveloped countries and get control of the commercial system in time, 4. the firms in the underdeveloped countries are made dependent on the multi-national companies as their associates in a one-dimensional way (pp. 1-6).

According to Hall, global capital is conscious of the fact that it can exercise dominance with the help of the local capital as well as the cooperation of the political and economic elites (qtd. in Mengu, 2003: 9). Therefore, instead of eliminating the local elements, global capital continues its function by means of them. According to Tomlinson (1999), globalization comprises an aimless mutual dependency and it produces a weakening effect of the cultural integrity of the nation-states for the benefit of the economically powerful ones. In addition, globalization broadens the global consumption. Thus, the means of consumption and their uses gain importance. "Marxist as well as Neo-Marxist Theories are the origins of the concept of consumption instruments…This theory indicates that the success of modern capitalism and the consumption cathedrals depend greatly on the control and abuse of consumers (Ritzer, 2000: 79). Recently, the increase in the importance of consumption has caused us to focus on the means of consumption rather than the means of production.

Considered as the constitution of global capital, the MAI Treaty that Turkey also signed in 1998 stipulates that the state should end its interfering and protective role or identity. With respect to the prescription for the free movement of the capital, the respective theory includes the following principles: a) elimination of the conditions pertaining to the use of natural resources, b) limitation of the speed of increase in wages, c) cancellation of social benefits, d) reducing the effect of labor in production, e) rescinding the laws and regulations related to social welfare etc. (Minibas, 2004: 3). All these conditions are the indications of the fact that how further global capital can increase its borders to survive.

Rationalized global institutions have negative effects on not only our health and environment, but also the most valued institutions, such as family. In the same way, the changes in the eating habits and dressing styles as well as the increase in hyper-consumption and the development of standard clothing should be noted. At this point, as Kongar indicated, global culture has deeply affected the changes in our consumption habits and lifestyles ("Cevizoglu, 2004).

1.2. The Role of Public Relations in the Global Rationalization Process and its Ethical Criticism

The role of public relations is to serve an institution, increase mutual understanding and enable dialogue and discussion. According to Vercic and Van Ruler, there is a difference between the use of public relations in the frame of this definition in the US and its domain, dimensions and definition in Europe. The difference between culture and language has a significant effect in it. Therefore, there has been an attempt to establish a common basis to determine the public relations concept. The terminological differences between the two continents, how the word 'public' is perceived, the differences between the meanings of 'communication' and 'relation' affect the ways that public relations is practiced as well as roles that are assumed. According to Oeckle and Van der

Meiden, while the relations between an institution and its target groups is understood in the American use of the public relations concept, the European comprehension includes the relations in 'the public sphere' and for 'the public sphere'. Thus, the 'public opinion' concept does not mean the combination of individual choices or votes, but a sort of political authority providing a standard for public relations. At this point, public relations assume a democratic function providing support for the free circulation of information and the development of public sphere (Vercic, et.al., 2001: 376). Moreover, according to L'Etang, the content of the perspective bringing together democracy and public relations comprises the views that public relations facilitates the unification of several conflicting points and at the same time increases the duration of the media interest. On the other hand, public relations industry, in fact, represent those who have paid to obtain service.

The European school of public relations research (Bentele, 2003) – more than its American counterpart – focuses on surveying "… the function or influence exercised on the society by public relations departments in any organization or by public relations companies". This "European school" contains our original Polish concept of transformational public relations (Ławniczak, 2003, 2005). It is based upon a thesis that in the so-called system transformation countries, public relations proved a very useful and effective instrument facilitating and accelerating: analysis of economic systems one can distinguish four fundamental variants/models of market economy: 1. The Anglo-Saxon (American), liberal and individualistic market economy, based upon maximizing short-time effects, too much focused on the financial result and too antagonistic. 2. The European social market economy (of different varieties) with a developed system of welfare and social safety, combining dominant private property, a prominent role of the state and the market-based upon controlled competition. 3. The Asian variant: - A "Japan type" collectivist market economy aimed at long-term success in the realm of industry where large industrial groups are immune to the pressure of short-term financial success and where the government and the industry are interrelated and show a specific type of entrepreneur – employees relations; - The authoritarian market economy of the so-called new Japans, i.e. Korea, Taiwan, Hong Kong and Singapore which countries have perfected the Japanese model and have successfully tailored it to their specific conditions. 4. The South-American version of the so-called dependent capitalism, characteristic of strong dependence on foreign capital, significant income diversity, high unemployment rate, illiteracy and poverty (Ławniczak, 2007: 1,2).

According to Hutton (2004), public relations is a managerial activity for analyzing the actions of the public, defining the policies and procedures of a corporation along with the public interests and employing an activity program to gain the understanding and acceptance of the public. What is meant by the rationalization function of public relations is that it includes all efforts to increase the consumption in foreign countries with regard to the products and

services offered by multinational companies that public relations agencies work for. The studies pertaining to the international marketing communications are full of the examples of these efforts. Therefore, international marketing communications refers to "the advertising, sales promotion and public relations activities for the purpose of increasing the sales of products and services in more than just one country" (Roth, 1982: 2).

The activities of public relations agencies are related to the elimination of the conditions that enable their customers (companies) to adapt themselves to the environments they function in. Thus, the discourse of public relations agencies related to the problems stemming form globalization might be as follows: "Most of our customers are under the pressure of non-governmental organizations…Pressure groups have already become an indispensable part of societies today…With their gradually increasing consumer environments, companies should try to gain their support instead of getting into conflicts with them" (Berth & Sjöberg, 1998: 47). In order to survive overseas in the global rivalry conditions, multinational companies should consider all kinds of conditions of different countries. Nevertheless, it should not be forgotten that as a result of some elements to be protected, such as language, culture, religion, traditions, regulations, political systems, several industrial practices etc., multi-national companies are somehow under the pressure of the public. Particularly the legal regulations of nation-states may consist of the measures preventing the enlargement of multinational companies.

There may also be similar obstacles for the globalization of companies. Public relations activities become helpful particularly in the situations where such obstacles are observed. In such cases, the initial step that public relations should take is to do a pre-research in order to determine the limitations in the systems and economic fields along with the power relations in the countries where the limitations are observed and also the more powerful and influential groups. Particularly in the situations where there are legal limitations, public relations professionals should get into contact with lawyers (Berth & Sjöberg, 1998: 49).

The public relations activities "financed by the US companies should try to find ways for keeping the channels open that will enable these companies to invade the economies of the other countries. For the purpose of realizing this objective, the manipulation of symbols is increasingly used by the dream traders with great skill and even with force" (Schiller, 1984: 216). The global effect of the US has shown itself especially in the field of culture-information, which in turn necessitates keeping individuals and societies under control through the manipulation of images and words. Ideas and beliefs of individuals are quite unprotected against manipulations. They try to exercise this manipulation by using the elements of the freedom concept. This, in fact, is just an illusion. Based on the fact that, communication is power, the power of control through definitions in the US is manipulated by the mass media as well as some

secondary institutions, for instance public relations, advertising and public opinion research agencies etc. (ibid. 241). Here, the opinion forming function of public relations on behalf of multinational companies emerges once again. Sir Harold Nicolson realized that "no policies could be successful unless there is a national opinion behind them and he also gives an example about Cardinal Richelien, who accepted the concept of opinion leaders as he pursued research studies on providing information and beyond that, guidance that unavoidably influences the thoughts and emotions of individuals" (qtd. In L'Etang, 2000: 49). Public relations reflect the effects of globalization in rather economic and cultural fields. In the same way, public relations employs several strategies in order to set up a mutual dependency between companies and environment in order to enable them to adapt themselves better and also affect the environment.

Related to the purpose of increasing the global consumption, there are some basic conditions for a company to be successful in the international marketing, such as presenting the products suitable to the needs of the consumers abroad, establishing an effective sales and delivery system to reach the consumers and carrying out the activities according to a plan in order to have an access to the international markets. In fact, planning plays a key role to harmonize the characteristics of the chosen market with the members of the joint committee for marketing.

In marketing planning, two important issues should be determined: the international marketing objective of a company and the marketing strategy as well as the marketing team that will fulfill the respective objective (Odabası, 2004: 275). It is the public relations agencies that realize these strategies and soon present them to the attention of the public.

By harmonizing the objectives of the exporters with the several differences of the foreign purchasers, including language, legal regulations, current means of media, economic issues, tastes, attitudes and purchasing processes, public relations practitioners try to fulfill the tasks in accordance with the company policies. The source of the ethical criticism of the pubic relations activities for the rationalization of global consumption is closely related to which role public relations has assumed in a society.

Ethics determines the standards that guide the actions. Therefore, it is related to the value or worthlessness of actions. Being a part of the socialization process, it is also the source of social freedom. In addition to analyzing some concepts, such as good, correct, useful or wrong, ethics enables individuals to tell the truths, to have the power and responsibility to express themselves (Odabası & Oyman, 2000: 432). The aim of ethics is to show that individuals should make ethical decisions by themselves and they should not surrender to anybody, any authorities and even the more powerful ones.

The question about which model public relations practitioners should assume (i.e. either the asymmetric or the symmetric model) is rather related to the concept of dependency. Should the practitioners depend on either the customers or the company or should they display dependency on both equally? Therefore, the ethical question about divided loyalty is in the centre of the public relations practices. The social role and values of public relations help make the problem conspicuous.

The public relations roles and models adopted by both the function and the practitioner influence its standing as a management function. Within organizations, public relations practitioners perform roles through their daily behavior, which Broom and Smith (qtd. in O'Dwyer, 2005), have conceptualized as a four-role typology of public relations practitioners:

1. *expert prescriber* – researches and defines the problem, develops the programme and takes responsibility for its implementation;

2. *communication liaison* – is concerned with the quality and quantity of information flow between management and publics;

3. *problem-solving process facilitator* – engages in a rational problem-solving process that involves planning and co-coordinating public relations activities with the top personnel in an organization, usually senior management; and

4. *communication technician* – describes practitioners who are involved in production work but not in policy or programme making (O'Dwyer, 2005).

Considering Broom and Smith's (1987) role typologies, Dozier (1992) found that while the same people incline to play the expert prescriber, communication liaison, and problem-solving process facilitator roles, different people play the communication technician role, which enabled him to reduce the four roles into two, namely manager and technician. Furthermore, according to Grunig, a management function can be achieved by only two of the original roles, that is, expert prescriber and the problem-solving process facilitator that are imperative to public relations (ibid.).

According to White, public relations practitioners define their role in four categories, namely: pragmatic, conservative, radical and idealist roles. The practitioners who assume the pragmatic social role do not give much importance to social responsibility and the ethical values of the company as a customer. They believe that each customer has the right of representation in the free market where ideas are formed. Therefore, these public relations practitioners associate their role with those of lawyers. Here, the aim is to consider the interests and objectives of the customers (Grunig & Grunig, 1996).

The practitioners who assume the conservative role reckon that their profession involves the consideration of the privileges and interests of the politically and economically powerful ones. At this point, an asymmetric approach is observed. Conservative practitioners consider that their role is to protect the capitalist system against the government as well as non-governmental organizations, unions and the socialists. The practitioners having the radical role; on the other hand, generally represent the companies requiring changes in society. According to this worldview, society is a system where knowledge and information posits power and influence, and thus change can be achieved in a broader social structure. By providing the knowledge that will be used in public discussions, by establishing connections among different groups and by uniting the sources that can provide solutions to social problems, asymmetrical public relations contributes to social changes (Grunig & Grunig, 1996: 12).

According to the practitioners who assume the pragmatic, conservative or radical social roles, customers should be able to attain the objectives without any interference of the public. Those who adopt the idealist social role aim at solving the conflicts between the companies and the public and they also defend the effectiveness of the objectives that are acceptable for both sides. With the idealist social role, public relations contribute to the strengthening of both the companies and the public. The problematic about the right and the wrong is determined according to dialogues, discussion and compromise.

Ethical problems stem from the clashes between the partisan values and the mutual values. "Sullivan defines the four partisan values as; commitment, confidence, loyalty and obedience. He also questions that if these partisan values are not directed by higher values, they lead to extremities by themselves. He considers the public relations practitioners who assume these values as the ones who exercise asymmetrical and one-dimensional communication" (qtd. in Grunig & Grunig, 1996). While the asymmetric practitioners consider themselves as lawyers, the symmetric practitioners regard themselves as consultants. In the dilemma between transparency and esotericism, expressing what the media and the public want to hear can be given as an example for asymmetric practices, whereas establishing a total dialogue with the media and the public can be given as an example for symmetric practices.

Just like Peru or the Federal Republic of Germany, the countries of social, economic and political transformation have employed public relations strategies and tools in order to shape a specific model of market economy. The process has involved both governmental and private institutions in a given country and – more or less openly – also ones from abroad. There are internal vs. external sources of PR activities and methods. Undoubtedly, it is internal factors which play a decisive role when a given country faces more or less profound changes of the political system, government or the political, social and economic model within a political system. This type of changes results from growing social

discontent following an economic crisis, unemployment and the resultant poverty, growing penury in the society and its stratification, a political dictatorship and failure to respect basic human rights (Ławniczak, 2007: 7).

According to Grunig, symmetric public relations may solve many ethical problems of international public relations. More importantly, for international understanding and cooperation, it can make public relations very effective. This situation seems the be giving an extremely powerful role to public relations practitioners in the international arena by neglecting the desires of those in international relations in order to gain power (qtd. in L'Etang, 2000: 75). Therefore, there are some criticisms that even though this model proposes freedom, potentially it has a totalitarian ideology. Nevertheless, symmetric model appears to be the most suitable one for ethical practices and social responsibility. It is also useful to mention the criticisms (pertaining to public relations) about the social responsibility concept that seems to be ethically positive. According to Milton Friedman, corporate social responsibility can be acceptable as long as the tasks done are totally out of the personal interests and the respective actions have legacy on the basis of improving the interests of a company provided that corporate communication is used for the long term interests of a company in order to hide the real intentions and interests. According to Habermas, public relations makes the relationship between the world of business and the media for the disadvantage of 'the others' and thus contributes to the erosion of the public sphere. In fact, public relations cannot be held responsible for that in itself. Nonetheless, public relations are hidden in its contribution to the dominant and determining powers of the market. All the rationalization and mind constructing efforts that public relations puts forth in the name of the multinational companies deviates it from the principle of social responsibility. In this context, a research study with regard to the public relations agencies in Turkey has been conducted.

2. Methodology and research

The purpose of this study is to find out how and to what extent the Turkish public relations agencies serving multinational companies carry out the respective rationalization and mind construction function as well as which social roles and values they assume and in which areas, what kind of activities and in which sectors they apply them. The corpus of the study includes the public relations agencies providing service to multinational companies, and these agencies are also the members of the public relations associations in the four biggest cities of Turkey, namely Istanbul, Ankara, Izmir and Bursa. The questionnaire was sent to 95 public relations agencies by e-mail and three weeks later, control e-mails were also sent. In order to increase the participation in this study, the associations that are in Istanbul were called up as well; however, only 16 participants returned the questionnaires. The results of the study can not be

generalized, but the 16 returned surveys contain information that should be retested in future by different methods.

As for the position of the respondents, 41.2% of them are general directors, 35.3 % of them are media relations managers, customer representatives, group managers, acting general directors, corporate communication managers, founding partners and advisors. Similarly, 23.5% are the heads of the administrative boards; 88.2 % of the participants are local public relations agencies, whereas 11.8% of them do not consider themselves as local; 94.1 % of the public relations agencies serve multinational companies. Here, a long-term service is provided to them. With the ratio of 70 %, the most important aim of the public relations performed for multinational companies is to stimulate the consumption attitude by creating a positive impression about these companies in society. The following objective is 'to prevent the probable local threats against multinational companies' with the ratio of 11.8 %. Moreover, developing communication strategies based on the analysis of local aspects with respect the business targets of a company and carrying out the due applications accordingly, in addition, making efforts for integration into the societies as well as their cultures that multinational companies provide service to, accentuating the references by enhancing the recognition level of the sector, increasing its respectability and increasing the demand by introducing the benefits of the products and services have also been mentioned for "the other" objectives in the questionnaire. At this point, the efforts of public relations to manipulate and influence for the purpose of increasing consumption and its internalization by the society can be noticed. The primary function is to gain the support of the public for the benefit of a multinational company. The emphasis on stimulating the consumption habits indicates that the efforts made are just for the benefit of a company and a pragmatic approach seem to have been assumed. This, in fact, is an application of the asymmetric model.

The ratios of the views about the social role of public relations with respect to their importance are as follows: with the ratio of 52.9 %, the importance of developing a dialogue between the client company and the public has been emphasized. Moreover, with the equal ratio, it has been indicated by the respondents that public relations is the supporter of the customer company and its function to persuade the public is also important. Similarly, discourse creating function of public relations agencies along with their capability of making changes in a society have also been considered quite significant with the ratio of 29.4 %. Finally, with the ratio of 70.6 %, it has been pointed out that assuming a protective role against the groups that may deteriorate the benefits of a company is unimportant for public relations. Here, there seems to be a minor difference between the ratios of the adoption of advocacy and consultancy roles. This case denotes that there is a thin line between the applications of symmetric and asymmetric models and the implementations as well as practices can be in both ways. "Gaining the confidence and support of the public depends on the

simultaneity of these two aspects…A company should not have any conflicts with the public benefit and constructive activities should be introduced to the public with effective public relations practices" (Asna, 1993: 88).

With regard to public relations agencies' style of working with multi-national companies, 58.8 % of the participants have stated that the headquarters prepares the strategic plans and public relations adapts them. A high ratio of the participants has mentioned that the adapting policy of public relations is valid for almost all sectors. The answers given to the open-ended questions are as follows: this circumstance is valid irrespective of any distinction among the sectors. Actions are taken by adding local aspects into communication and integrating the culture, values and consumer preferences of the respective country.

Almost all multinational companies seem to have assumed the 'think globally and act locally' approach that started with Coca Cola. No matter in which sector a company is providing service, it has to construct its messages and the public relations projects that will convey these messages by considering the characteristics of the target groups. It is imperative that the cultural references of a society be harmonized with aggressive marketing projects. Culture determines the perception and application of public relations in the context of government and private sectors as well as the obtained roles and the related models.

Accordingly, of the four major models of public relations practice discussed previously, only two allow for full participation of the function in management: the two-way asymmetrical and two-way symmetrical models (Grunig et al., 1992). Furthermore, in fulfilling the demands of these function models and the expectations of management, public relations practitioners are likely to play one of two roles, either the expert prescriber or the problem-solving process facilitator (Grunig qtd. in O'Dwyer, 2005)

The ratios of the most intense working areas are as flows: 58.8 % relations with the media, 41.2 % corporate image, 35.3 % issue management, 29.4 % consultancy and brand marketing, 23.5 % brand image and social responsibility, 5.9 % activity management, advertising and sponsorship. Therefore, it can be inferred that the mediating role of public relations in reasoning function is performed rather through the relations with the media and corporate image activities.

Within the context of social responsibility and sponsorship, the ratios of the three project areas that public relations attributes importance have been calculated in percentages with respect to the cumulative results (17 x 3 = 51). According to the findings, the greatest importance appears to be given to education, environment and culture/arts.

The first three groups that are contacted in the name of the multinational companies are the media companies with the percentage of 47.3 %, universities (29.9 %) and vocational associations. They are followed by marketing and public opinion companies as well as societies and foundation (14.99 %) and finally private companies (11.8 %). It can be noticed that the information and public opinion activities related to multinational companies are carried out mostly by means of the media companies, universities and vocational associations. In its practices pertaining to these three institutions of a society, public relations should aim not only to consent engineering, but also ethical principles because expressing what the media and the public wish to hear can be given as an example for asymmetric applications. In the same way, forming a strong dialogue with the media and the public can be given as an example for the symmetric applications of a company.

As for the most important reason for working with multinational companies, profit, prestige and development have been stated with the ratio of 64.7 %. The first three companies that mostly work with multinational companies are food industry (23.9 %), cleaning-cosmetics (18.9 %) and health (18 %). They are followed by technology (12 %) and durable goods (9 %).

The types of information that is mostly provided by public relations agencies within the context of multinational companies are the news about the companies (52.9 %) and the news about products and services (35.3 %). The news about environment and the conditions affecting the society have not been checked in the questionnaire, which indicates that the information topics are rather focused on the companies.

Furthermore, the ratios of agreement with the ethical principles of public relations determined by Hugh Culbertson (2003) are as follows: 82.4 % of the respondents find the principle very important that "a public relations professional should be a part of and cooperate the administration." In addition, 58.8 % of the respondents consider the idea very important that "a public relations professional should listen to the target groups and the public." On the other hand, 41.2 % of the respondents find the principle less important that "a public relations professional should serve the public as much as his or her customers." Moreover, the ratio of those who consider the idea important that "a public relations professional should be sensitive to the experience and reactions of his or her colleagues, managers, customers and the public" is 52.9 %. In the same way, according to 35.3 % of the respondents, the principle that a public relations professional should keep the news and information channels of the public open in case of events is very significant. Similarly, 47.1 % of them regard the principle important that "a public relations professional should analyze the events and make unique decisions with respect to general rules. In addition, almost an equal ratio of the respondents reckons the principle very important that "a public relations professional should work to make the facts

known totally. Finally, 58.8 % of them consider the principle very important that "a public relations professional who has a certain ethical notion should not work for the customers and managers that he or she regards as unethical."

3. Conclusion

This study is a critical determination of the situation pertaining to public relations practices under the influence of globalization. Thus, the social role or roles are assumed by the public relations agencies in globalization process have been analyzed with a questionnaire in this study. Having been loaned from the West and applied as a method of communication, the perception and application of public relations in Turkey deeply influences us as country which has rather been exposed to the negative effects of globalization. Hence, the roles of public relations practitioners and the applied methods, our effect on the realized communication strategies, localizations or the imposed global values as well as our participation in decision-making processes or our consciousness in our decisions have been questioned. According to the findings, there seems to be a minor difference between the ratios of the adoption of advocacy and consultancy roles. This case denotes that there is a thin line between the applications of symmetric and asymmetric models and the implementations as well as practices can be in both ways, which, in turn, denotes that generally, the management role is assumed.

The issues related to providing information concentrate on corporations. The first three groups that are contacted for multinational companies are: the media, universities and vocational associations. It is usually reckoned that the most important role of public relations is the idealist social role; on the contrary, it is also assumed that the most important objective of public relations is to stimulate the consumption habits by creating a positive image about a company in the public. At this point, there seems to be dichotomy. Besides, the word 'public' in public relations is used in the way that is adopted in the US, i.e. an organization and its target groups. In other words, public sphere is not given much attention. Accordingly, the types of information that is mostly provided by public relations agencies within the context of multinational companies are the news about the companies (52.9 %) and the news about products and services (35.3 %). The news about environment and the conditions affecting the society have not been checked in the questionnaire, which indicates that the information topics are rather focused on the companies.

Similar to the other public relations efforts, some social responsibility activities that are intended to establish positive ties between multinational companies and the public aim at making the target groups feel themselves free by introducing the slogans drawing the attention of the public. Globalization creates a new discourse that cognitively shapes the strategies and decisions of the actors in the economic life. Therefore, pleasures of the mass are presented as individual ones

and for the continuation of this, the society considered to be made up of consumers is stimulated towards consumption. This illusory motivation is undoubtedly a part of the rationalization function. One of the means that produce this illusion is the public relations firms. In practice, a society gets stuck into the idea that existence can be maintained only with consumption by isolating itself from the economic, cultural and social facts of the current situation through globally materialistic and cultural consumption. Hence, public relations seem to have assumed an instrumental role in making consumption reasonable. Nevertheless, as Habermas indicated, public relations itself cannot be held responsible for it. In the frame of all practices, as Kucuradi pointed out, what public relations has to do here is to act within the consciousness of ethical freedom and, as local public relations agencies, to display initiative to take the due precautions that will always care about the responsibility of a society.

In order to exercise ethical judgments, five duties or responsibilities have to be taken into consideration: 1. the duty that we take on: is to make a distinction between our interests as well as conscience and to base our actions on our values. 2. Our duty for our customers: our customers and our target groups deserve the best effort we can make. However, actions should not be taken hastily without questioning whether the intentions and the ethical values of the customers are compatible with ours or not. 3. Our duty for our company and administrators is to consider the effects of the policies and actions of them. Consideration of the negative and positive effects; on the other hand, necessitates the formation of an ethical consciousness. 4. Our duty for our colleagues: deliberating over the prestige of the profession is to consider the commitments indicated in the ethical codes of the vocational associations. 5. the duty for the society: is to question what an action does for/to individuals. It is, in fact, the most fundamental test of ethics (Smith, 2002: 84). Thus, public relations should develop the sense of social responsibility and social consciousness. In the same way, it should be a linking pointy among the private sector, state institutions and society. In addition, public relations should be a bridge between the respective institutions and the public. It ought to assume a mediating role without allowing any inter-personal conflicts and conflicts of interests. Moreover, public relations should be the director of laws and regulations that meet the requirements of not only the freeholders but also the workers, the poor and the unemployed. Needless to say, there should be an economic order that supports the free enterprise, prevents the distortion of the security and working conditions and in a society and that will not turn into a monopoly. Public relations ought to extend the requirements and expectations of the public to the state institutions related to economy and production along with the institutions out of the state. In the same way, public relations should monitor all these activities.

The study in summary is an attempt to understand the practices of Turkish public relations agencies when working with multinational companies. Their

practices imply the role they engage in the most and model/s they use. The questions asked also help to understand what is ideal and what is practiced by them. Also 'public' interpretation by the Turkish practitioners is sought in the study. The very low rate of return makes it impossible to generalize the results, on the other hand, the few, but rich surveys filled give a picture of practices with multinational companies. There needs to be a follow-up with the survey respondents through qualitative study to explore certain topics and also there needs to conduct a general study on the Turkish public relations agencies and their client relationships to explore the role of public relations in the society.

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Religion(s) in the Contemporary Bioethics Debate

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Introduction

The present communication aims to analyse several parameters of the complex debate on Bioethics, especially those concerning the relation between Science and Religion. Given the confusion of this dialogue, where a broad range of experts, organisations and/or legal entities are involved, the synthesis of a unique Bioethical framework globally applicable, seems the absolute illusion. Several aspects are present in this debate, which, depending upon a series of factors, are sometimes contradictory, sometimes overlapping, or parallel, or declining. Even the content of this interdisciplinary field varies according to the point of view of those involved in it. Thus, for instance lawyers concern Bioethics mainly as legislative frameworks, whereas for physicians it is identical to Medical Ethics. For most theologians it is a supplement to their theistic approaches, helping them to bridge past and present morality issues. On the other hand, according to some of them, Bioethics is accused as a sophisticated intervention of a growing social Darwinism. Geneticists and researches in the field of Life Sciences assume it as a practical guideline of moral principles regulating their research activities. For environmentalists bioethical issues are directed towards the sustainability of the biosphere as a whole. Various NGOs and indigenous people representatives, maintaining their fears for possible genetic exploitation, concern Bioethics as a means for the protection of their human rights. Liberal economists perceive Bioethics as a field of ideological battles, since they consider such critical approaches as negative factors for

economic growth. For educational authorities it is a new field to be taught, and so on and so forth.

Consequently people, who theoretically are the final beneficiaries of biotechnological innovations, stay confused in the middle of an overflow of contradictory and hardly elaborated information provided by the mass media, unable to take conscious decisions, lacking the proper educational background to face the contemporary challenges. Feeling easier to obey to pre-decided rules in their everyday lives instead of making choices on their own responsibility, many people turn towards their religion, since their faith offers them a traditional ethical framework to be followed. This situation partly explains the intensive presence of religions within the contemporary hi-tech civilisation.

We try here to point out the factors involved in this phenomenon, discussing similarities and differences between Religion and Science in an anthropological perspective.

The status and the role of religions through time

Following the traces of primitive social structures in the first organized groups of humans, one could easily recognize the early presence of religion (s). Since the dawn of humankind, the first "religions", actually magic or animistic practices, were functioning as factors of social order and cohesion improving the effective adaptation of the tribes in their environments.

In all ancient cultures mystic believes, dominant Gods controlling metaphysic powers, absolute dogmas, are "naturally" accepted by the groups' members. High level hierarchies manage the primitive governance systems as trustees and interpreters of the ultimate apocalyptic truths, as organisers of rituals or as social regulators.

All these archaic "churches" provided definite answers to everyday problems, by consoling metaphysical agonies, attributing justice, healing illnesses and implementing norms of social relationships. The whole life cycle, including mating, conception, birth, growth, adultness, aging and death, has been monitored through Religion's Institutions and clergymen, in the early human cultures.

However, even in the modern societies, which have been structured on the rationalistic approach of secular states, religions reveal an impressive worldwide persistence. A variety of religions are actively present in all cultures, dramatically influencing billions of people.[1]

[1] According to the Atlas of Faith of 2002 the major religions surviving today in the total population are: Christianity (17.4% Roman Catholics, 5.6% Protestants, 3.5% Orthodox, 6.4%

All religions promise to their believers the "Ultimate Truth", established on creation myths and mystic symbols. All of them create their own communities ("churches"), leaded by the wise specialists of their hierarchies, through doctrines and rituals. They have a huge sentimental impact to their believers and, in several cases, they have fed (and still feed) dangerous fundamentalist movements.

From the anthropological perspective, religion could be seen as a successful fitting event during the on going human co-evolution process. Religion, then and now, being a coherent grid of axioms and principles, softens the metaphysical human agony, offers explanations regarding the origin and function of the universe, and guarantees social clustering and coherence.

Religious people face their faith as an "all inclusive" guide-line for their life, thus avoiding critical thinking, transferring their responsibility for conscious decisions to the God's harmonious rules, preferring to follow a given pathway than to make choices.

Consequently, Religions carry important power in terms of social control. This power is justified by themselves through their ideological concept, useful for the orientation of their numerous believers. However they have a more cosmic dimension as well, which is not that obvious to the religious public. Religions in the contemporary world are abstract entities with legal personality, that act as "spiritual enterprises", maintaining their own properties, owning banks and shares in stock markets, influencing policy and administrative structures and participating in the international geo-strategic game. Since new technologies are part of this game, it is not expected that religions would stay indifferent to the share of power.

Religion / Science: Parallel, intersecting, or contradictory pathways?

Although today Religion and Science are perceived as controversial systems, it is also accepted that early Religion incubated the germs of early Science, by encouraging thinkers to approach God. Religions offered an easily understood explanatory mechanism of Nature, by attributing all phenomena to the sovereign Creator.

other Cristians), Islam (19.8% Muslims), Hinduism (13.3% Hindus), Buddhism (5.9%), Judaism (0.2%), whereas a 13% of the total population believes to various primal/indigenous religions, African traditional religions, Sikhism etc.

As a complete explanatory set of natural phenomena in combination to practical instructions for everyday life, Religion functioned as one of the many factors favouring the transition from the primitive human groups to the early "civilized" societies.

In the dawn of humankind, the first "religions" are successful group responses to the environmental challenges. Magic practices have been an evolutionary successful admixture of early "religion" and "science", offering advantages for the tribe's survival. As the human civilisation develops, both religious and "scientific" functions are exclusively performed by the wise leading hierarchy. The clergy preserves and transmits in secret the advanced "scientific" knowledge and experience. This is the case for instance of the clergy in ancient Egypt, or in the early Central America's civilizations.

The origins of the contemporary rationalistic Science can be traced back to pre-Socrates philosophers. Ideas about an integrated scientific interpretation of Nature, based on observation and trial, arose in ancient Ionia. (e.g. Thales of Miletus).

The self-confident inquiring mind, which dares to put questions and search for answers independently of any "gods", flourish in the ancient Greek environment.

During Medieval, the surviving theories of Plato and Aristotle, do not contradict the theocratic approaches, whereas the aspects of Democritus, or Heraclitus are ignored. In general, the monotheistic religions of the époque, based on the ideal of an ordered and harmonic universe, actually support the "scientific" inquiries, as far as their dominance is not doubted.

The Renaissance brings a spiritual revolution concerning the scientific interpretation of Nature. The charm of Ionian Philosophers revives. Copernicus re-invents the sun centred model of Aristarchus from Samos, thus striking the geo-centric model of the known world. Galileo puts the bases of empiricism, although experiencing an adventurous relationship with the Catholic Church. In the same line, Newton's physics on gravity and light reveals a universe functioning as the perfect mechanism made by the Creator-Architect of the world.[2]

Rene Descartes promotes the duality of the human nature which is consisted both by matter and spirit, appreciating the mental capacity of the human brain to understand the world. Science is not yet weaned away from Religion, still trying to integrate the scientific observation in a religious structural frame.

[2] *Alex. Pope: "Nature and its laws were hidden in the dark. And God said: Let Newton be born! …and everything became light..*

Gradually however, Science and Religion proceed towards deviating pathways. The duty to explain the real, material world is attributed to Science, whereas Religion keeps the exclusive responsibility for spiritual issues and the human soul. Yet, in this historic framework, God, the ultimate regulator, does not prevent the rationalistic approach of the universe, thus the investigation of the cosmic mechanisms through reason and experimentation goes on, without obstacles.

Until the end of the 18th century, the contradiction between Science and Religion, smoulders, although it does not turn to an open war. During the period 1680-1800, Physiocratic Theology suggests that the existence of God guarantees the objectivity of the world.[3]

The definite split between Science and Religion came along with the Darwinian revolution. The documented evolutionary aspects presented in Darwin's book *"The Origin of Species"* in 1859 lead to the final gap between scientists and theologists.

The belief to the unchangeable species created by Genesis was irreparably broken. The resulting shock was so strong, that the storm of reactions still exists.

Even today, in our secular western culture, traditional Creationism and its modern version, the theory of Intelligent Design, are propagated by powerful intellectual, political and economic centres, constituting the number one threat of scientific rationality. Religion is of course hidden behind.

The outbreak of Biology and Life Sciences / Bioethics

Founded on the cornerstones of Physics and Chemistry, which dominated the scientific landscape until the beginning of the 20th century, Biology went ahead after the successful documentation of fundamental life mechanisms. Between 20's and 60's a series of eminent researchers among whom Morgan, Watson and Crick contributed in the establishment of the wide field of modern genetics. The 'big bang' in biological sciences was the discovery of the DNA structure in 1953, followed by the clarification of the genetic code.

Soon, Biotechnology and Bio-informatics, rapidly developing, started to accelerate the research in the field of life sciences, pulling it to the extreme. In parallel, the expectations for huge profits based on the updated genetic

[3] As Brooke puts it*: the God known through science would prove most vulnerable to being overthrown in the name of science.*

knowledge and its potential applications, attract the attention of biotechnological and pharmaceutical companies. Mislead by economic interests, Science is gradually transformed to an international competitive business at a scale beyond any known experience. The discoveries and innovations of genetics dominate the contemporary research scene, contributing crucially to the global economy.

Cloning, xenotransplantation, Genetically Modified Organisms, artificial reproduction techniques, gene therapies, stem cells research, pharmacogenetics, etc..etc.. (the catalogue is endless) challenge our awareness about our future. *Homo sapiens sapiens* realises that his ability to implement irreversible changes to its own species and ecosystem could turn to a curse. The evolutionary dynamics, which for millions of years regulated the entire earth bio-system through the interaction of natural forces, has been disturbed by man. Biotechnology interferes crucially and rapidly in the evolutionary procedures. The unpredicted consequences of the heady biotechnological race seem frightening for the sensitive balances of our ecosystem and the future of several species including our own.

Thus, today Bioethics becomes an essential interdisciplinary field of debate. Bioethics seem to be indispensable to monitor the contemporary societies, which are progressively more controlled by the combination of high technology and economy, in absentia of traditional values and proper moral principles.

Bioethics: Term and Content: A short historical note

During the millennia of the humankind, Ethics used to be a system of principles developed within the various cultures, regulating the individual and/or collective behaviours according to their tradition and needs. Therefore, initially Ethics was a humanistic field for Philosophers and Theologians.

The paternity of the term "Bioethics" could be attributed to the American oncologist Van Rensselaer Potter, who dealt, among others, with the relationship between ethics and biological sciences, which finally resulted in the conception of the necessity of their linkage. The word bioethics first appeared in the title of Potter's book: *Bioethics: Bridge to the Future"*, published in 1971. [4]

Since its birth, what is known today as Bioethics has undergone a complex conceptual metamorphosis:

[4] An informative survey about the evolution of Bioethics can be found in F. Cascais: *"Bioethics: From the Early Days to the Present"* (Studia Bioetica, v. 3)

Initially bioethics focused on a perceived "dehumanization" of medicine by the rising power of science and technology. Remedies were sought by introducing humanities, ethics, and human "values" into the medical curriculum. Ethics was one among the humanistic disciplines, but not the dominant one. As the medical services became available to larger population sizes, the term bioethics was perceived as a corpus of moral principles related to medical practices, i.e. it looked identical to clinical and general medical ethics.

In a second phase, ethics assumed a dominant role as ever more complex dilemmas emerged from the rapid pace of biological research. As such dilemmas were applied to medical practice, the need for a more rigorous and more formal analysis of their moral status was clear. Philosophically-trained ethicists had an obvious role. They began to teach, write, and profoundly influence medical education and practice.

Potter, having seen his term “bioethics” being used exclusively in relation to issues of medical ethics, in 1988 suggested a new name to be introduced for the “science of the balance between humans and nature” which was “the bridge to the future of mankind”- “global bioethics”. So originally Bioethics was the intuition that the long-range survival of the human species in a decent and sustainable civilization requires the development and maintenance of a *system* of ethics. Such a system is *Global Bioethics*, based on intuitions and reasoning constrained by empirical knowledge from all the sciences but especially biological knowledge.

Today, indeed, the term Bioethics refers to a much broader concept. All our aspects about the life cycle within a global biosphere must be reconsidered, under the light of the modern biotechnological era. Humankind needs urgently moral and legal frameworks in order to apply successful social control on the astonishing biotechnological innovations.

The emerging global interest in the establishment of broadly accepted bioethical principles is reflected to the increasing number of relevant organisations and committees all over the world.

About 40 national bioethics committees are in function in the European area, about 100 in various countries of the other continents, providing policy advice across a wide range of “bioethics” topics and /or determining the ethical standards or policies for research with human beings.[5] All eminent Universities and Institutions have established their own Bioethics organisations. The topic has been introduced in the curricula of higher education studies in several disciplines besides medicine. Numerous conferences and scientific meetings are organised each year all over the world.

[5] Detailed data can be found in the web site of WHO (http://www.who.int/ethics/committees).

International entities like UNESCO, WHO, EU etc, promote documentation and research on Bioethical issues at international level. They produce rules and recommendations on the moral principles needed to deal with crucial issues of extreme interest. [6]

Since the 1970s, UNESCO's involvement in the field of Bioethics has reflected the international dimensions of this debate, as well. Founded on the belief that there can be no peace without the intellectual and moral solidarity of humankind, UNESCO tries to involve all countries in this international and transcultural discussion.

The UNESCO Bioethics Programme was created in 1993. Bioethics belongs to its division of Ethics of Science and Technology, being one of UNESCO's five principal priorities. The first major success of the Bioethics Programme occurred in 1997, when the General Conference adopted the *Universal Declaration on the Human Genome and Human Rights*, the only international instrument in the field of bioethics, which was endorsed by the UN General Assembly in 1998. It is primarily responsible for the Secretariat of two advisory bodies: the *International Bioethics Committee (IBC),* composed of 36 independent experts, and the *Intergovernmental Bioethics Committee (IGBC)*, composed of representatives of 36 Member States. UNESCO Programme develops four main action areas: a) Intellectual forum, b) Standard-setting action, c) Advisory role and capacity-building and d) Education and awareness raising.

Bioethics and Religions:

Whereas the aforementioned indicative cases are based on a secular conception, several churches worldwide have established their own Centres on Religion and Bioethics, like for example:

a) Christian: The National Catholic Bioethics Centre, the Bioethics Institute of New York Medical College, the Centre for Bioethics and Human Dignity, the Centre for Christian Bioethics and the Centre for Christian Ethics, the Bioethics Committee of Orthodox Church, etc.

[6] For instance, topics promoted recently by the World Health Organisation, as they are displayed in the relevant web site, show the bioethical priorities of WHO: *Addressing Ethical Issues in Pandemic Influenza Planning , Ethical issues raised by the HIV/AIDS epidemic, Human Genetic Databases, Cloning: A dozen questions (and answers) on human cloning, Ethical issues in long-term care, Human organ and tissue transplantation, Patent applications for SARS virus and genes, Pharmacogenetics.*

b) Jewish: The Hebrew Union College Ethics Centre, the National Institute of Judaism and Medicine,

c) Muslim: the Islamic Organization for Medical Sciences.

This happened because the various religion systems consider that for many individuals, religious traditions provide important resources for moral deliberation. While contemporary philosophical approaches in bioethics draw upon secular presumptions, religion continues to play an important role in both personal moral reasoning and public debate, despite the predictions of many late 19th and early 20th century social scientists about the foreseen demise of religion.

In any case the "de facto" involvement of Religion(s) in the Bioethics debate cannot be ignored. In the 11th Session of the UNESCO International Bioethics Committee, which was held in Paris in August 2004 with the participation of more than 250 experts from at least 80 countries, high level representatives of all major religions were present. The aspects of Muslim, Confucianism, Hindu, Catholic Christian, Buddhist, and Jewish traditions, concerning applications of new genetic technologies, were analysed. Sophisticated differences among them, deriving from their fundamental perceptions about life and death, human dignity, autonomy, free will, reproduction and medical practices were discussed. It became clear that each particular dogma tried to combine its own tradition with the scientific innovations, thus creating a compromising set of rules to be followed by the public, of course under the guidance of religion. All dogmas denied to approve the human cloning for instance, but as far as the stem cell research, or organ transplantation are concerned, their approaches differ significantly.

There is a sense of awkwardness in the effort of Religions to adapt in the high tech framework of the contemporary civilisation. In spite of this, religious leaders deny to leave the ground of moral decision making to politicians, scientists and philosophers without their contribution.

Religion and Science; Contemporary Confrontations

On the other hand, the confrontation among Science and Religion engages today the interest of both scientists and religious leaders. That is because, theoretical issues like creation and the origins of humans, (the usual starting points of the conflict) although apparently distant from the everyday life, are directly linked to several crucial sectors of the society, like policy making at national and/or international level, education principles, activities funding etc.

Moderate voices try to smooth the contradictions. Recently, Gould has tied things together in a short book - *Rocks of Ages: Science and Religion in the*

Fullness of Life - in which he expounds the principle by which he tries to preserve harmony and dignity between science and religion. Essentially his principle is one of separation: good fences make good neighbours. He thinks that science and religion speak to different dimensions and properly understood do not and cannot overlap and conflict. He speaks of science and religion as separate "Magisteria" (domains of understanding) and Gould advocates the principle of "NOMA" i.e. Non-Overlapping Magisteria. Science has its dimension and religion has its dimension and never the twain shall meet. Creationism must be wrong because it is a Biblical (hence religious) doctrine presuming to speak of astronomy and biology (scientific doctrines).

"NOMA is a simple, humane, rational, and altogether conventional argument for mutual respect, based on non-overlapping subject matter, between two components of wisdom in a full human life: our drive to understand the factual character of nature (the magisterium of science), and our need to define meaning in our lives and a moral basis for our actions (the magisterium of religion).

The net of science covers the empirical universe: what is it made of (fact) and why does it work this way (theory). The net of religion extends over questions of moral meaning and value".

However, Gould's ideas have been strongly criticised by both sides. Some opposite aspects are drafted below:

Dr M.D.Magee, claims[7]:

"Patriarchal religions have caused more persecutions, wars, and miseries than any other cause. As we have recently seen, the darkest wrongs are still inspired by them, yet to accept NOMA is to accept their religious myths as the basis of our moral behaviour. But why must we accept that divine inspiration mediated by ancient mythologies is the only source of morality for humans? The science of cultural anthropology shows us that moral beliefs are relative, they depend on cultural context, and they evolve. So, why should science relinquish its right to discuss rationally and modify moral beliefs to an authority that doesn't have a shred of supporting physical evidence to submit?

Divine laws like those in the Bible or the Koran are simply the expression of acceptable social behaviour as a contract (covenant) enforceable by the king with God's unchallengeable authority. The psychology of Christianity is rooted in the fear of god, fear of hell, fear of death, and fear of the unknown, all intended to compel obedience. Religions benefit politicians, rulers, and power

[7] in his 2002 article *"God, Gould and NOMA"*, (http://www.askwhy.co.uk/truth/420GouldNOMA.html

thinking theologians. People who are enslaved by superstition and deceived by mysticism are more easily governed and held in bondage. Spouting superstitions to the ignorant is the Christian way."

Strong critics have also been expressed in the AAAS Symposium especially dedicated on Non-Overlapping Magisteria (19 February 2005), by several participants:

Paul Kurtz[8],"notes*: "There is an inherent conflict between religion and science, especially if religion claims to have a special or higher truth, if it maintains that ethics must be based on religious faith, or if it insists that the political order must draw its basic principles from religion. I submit that ethical principles can be autonomous; that is, based on humanistic values and rationalistic deliberation, focusing on human happiness and social justice, not obedience to absolute religious principles or values".*

…and John Hedley Brooke[9]:

"Stephen J.Gould's NOMA principle is an attractive default position but is not itself value free. It has been enunciated in many forms in the past to defend the autonomy of science and/or the autonomy of religious belief. Consistent application of the principle has proved difficult in many contexts even for those who have adopted it. Gould himself, when speaking as a historian of science, declared that "facts are not pure and unsullied bits of information; culture also influences what we see and how we see it." Since religious beliefs and practices are part of many cultural matrices, this would seem to open the door to the penetration of scientific thinking by religious predispositions. In this talk I shall discuss some of the historical examples used by Gould (Galileo, Thomas Burnet, James Hutton…) in order to expose the tensions between his writing as a scientist and as a historian of science. My examples will show that it is necessary to differentiate between various levels on which scientific and religious concerns might meet: there can be separation on some levels but not always on all. Could NOMA still be held up as a contemporary ideal despite the historical evidence? The controversy between Gould and Simon Conway Morris on the interpretation of the Burgess shale suggests that ideological, even religious, commitments may still shape theoretical preferences. In the final section I shall briefly review some of the ways in which religious beliefs have had a constructive bearing on the scientific enterprise, without, however, seeking to draw normative conclusions."

[8] in his communication under the title: **"***Science and Religion: Are They Compatible?"*

[9] in his communication: *"Shaping the Content of Science: Have Religious Beliefs Played a Role?"*

Finally, Richard Dawkins, the Charles Simonyi Professor of the Public Understanding of Science at Oxford, since 1995, in his recent book *" The God Delusion"*, examines God in all his forms, from the sex-obsessed tyrant of the Old Testament to the more benign (but still illogical) Celestial Watchmaker favoured by some Enlightenment thinkers. He eviscerates the major arguments for religion and demonstrates the supreme improbability of a supreme being. He shows how religion fuels war, ferments bigotry, and abuses children, buttressing his points with historical and contemporary evidence. *"The God Delusion"* makes a compelling case that belief in God is not just wrong, but potentially deadly. It also offers exhilarating insight into the advantages of atheism to the individual and society, not the least of which is a clearer, truer appreciation of the universe's wonders than any faith could ever muster.

Modern Genetics and Religions: Some inconsistencies

Modern Genetics and Biotechnology are born within the framework of Western research centres. They are descended from a long lasting scientific tradition, based on rationalism and experimentation. Their structure and methodology constitute a scientific system irrelevant to any Religion. Since at least the last two centuries, Science develops in the framework of secular states. However, the contemporary Religion Centres still insist to be involved in Science activities. Not surprisingly, since the initial progress of the contemporary Science started in the western (Christian) world, it was the Christian Church that first discussed bioethical issues in a religious perspective. In a second phase, the frontiers of Life Sciences were transferred all over the world, due to the dissemination accomplished by foreign scientists who were trained in western centres (mainly in USA and Europe). Then, other religions started to deal with bioethical issues, trying to combine their religious traditions and holly scriptures with the modern life patterns introduced through the generalisation of new technologies.

Such combinations look odd to our secular culture. For instance, the Medical Sciences Seminar on Genetics, Genetic Engineering, the Human Genes, and Genetic Treatment, organised in the State of Kuwait, from 23 to 25 Jumada al-Akhirah 1419 AH, (corresponding to 13 to15 October 1998) by the Islamic Organisation for Medical Sciences, started as follows: *"…In the name of God; the Merciful, the Compassionate…Thanks are due to God, Lord of all creation. Peace and blessings be upon our Benefactor, Mohammed, who was sent a mercy to all creation, and his family and companions…"*

We cannot imagine any similar situation in the opening ceremony of a scientific conference in the West. No scientist believes that God will contribute to the genome mapping for instance, or that answers to scientific questions can be provided outside the laboratory through the holly scripts. Science of our Western

civilization constitutes a separate world, uses a distinct language and proceeds through its own self-control. There is an a priori incompatibility between the contemporary Science and the various surviving religious systems. That makes the interdisciplinary Bioethics debate endless and inconsistent.

However, the outcome of this dialogue has an important impact in several basic components of our society, like the education of the public on morality related to the use of biotechnological innovations.

Religion and Science in the Anthropological framework

The recent developments in brain research confirm the extraordinary evolutionary jump of the human brain, which upgraded the human creature to the modern *Homo sapiens sapiens*. It is our infinite brain capacity the distinguished trait that makes us humans. The brain is our mind. This tissue controls all our spiritual abilities, including our inquiring tendency, our self-consciousness, our thinking ability. In this perspective, both Religion and Science are products of the same source. They both constitute alternative outcomes of a wider cultural system, as it is evolving in parallel to our brain evolution. Faith and logic are originated from the same biological organ.

Both Religion and Science are complex intellectual systems that: try to interpret Nature, use symbolic languages, suggest patterns of life-style, spread to the wide public and strongly influence it, show a certain adaptation to their contemporary environment. They reveal too many structural similarities to be random.

However, regarding their methodology, their fundamental differences are easily notified.

Whereas Religion is established on the blind faith, Science develops on doubt, the religious obedience is replaced by inquiry and investigation. The truth of the holly texts, in the case of Science is continuously tested through experimentation; the mysticism has been replaced by transparency. Whereas Religion tries to preserve a given status, Science promotes revolutionary ideas in favour of a dynamic evolution.

It is impossible to combine these diametrically opposite pathways, within a Bioethics dialogue. For this reason, it is also impossible to find a common theoretical framework on which a synthesis of moral principles, so much needed to regulate our societies, could be constructed. The multidisciplinary Bioethical Committees, just preserve an endless debate, unable to come to final, commonly accepted conclusions.

Thus, the only common consensus that can be achieved among the Bioethics debate protagonists concerns the emergency to create ethical frameworks

suitable for the modern societies. From this point and on, the aspects decline since their vectors are engaged within different cognitive systems, related to different background, principles and objectives.

An endless debate is a hopeless debate?

Rethinking about the factors involved in the Bioethics dialogue, results to a list of assumptions to be considered:

- Our civilization in the globalisation era is absolutely depended upon scientific progress and technology. All cultures are influenced by the western patterns globally implemented.
- A dominant economic component is directly related to this progress.
- The moral values of the past are insufficient to cover the ethical needs of the contemporary societies.
- The peril of irreversible crucial changes, harmful for our ecosystem is real.
- The inability of the people to fully understand and reasonably use the biotechnological innovations incubates restrictions of human rights.
- There is a lack of proper education of the wide public concerning science understanding. Unfortunately, this deficiency concerns also many policy decision makers.
- Religions as social regulators are present, trying to fill the moral gaps, but their proposals are "out of date". The answers they provide do not correspond to the problems of the time.
- Moreover, their conceptual approaches to issues like human autonomy, human-nature relation, life and death etc. vary significantly among the different religions.
- The field of Bioethics grows up in parallel to the accelerated scientific progress, but it becomes more and more complex as the moral dilemmas are multiplied and the number of participants in the debate increases.
- The make-up of the national bioethics committees reflects either the conservative or the progressive preferences of the governments on charge. The resulting discontinuity of strategy on Bioethics decreases the expected added value.
- Definite, commonly accepted principles are needed, but they can hardly be achieved. Whenever any ethical or legislative framework becomes acceptable, it is already delayed, because the frontier of biotechnology has moved ahead with novelties which are not covered by the existing regulations.

Although such a dialogue faces inevitable difficulties and generates strong controversies, it is a way towards the construction of a requested ethical system. The Bioethics debate proceeds slowly, but still proceeds.

The main issue is to illumine the hidden sides of both Science and Religion and to approach the wide public to the best possible degree. This is a laborious and long lasting effort to be undertaken by educational bodies, based on an unprejudiced rational background.

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Evolution, Religions and Global Bioethics

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Abstract

Creationist theories are still present in the United States and in Europe. The Darwinian theory of evolution is often considered as the starting point of important debates between religions and evolutionists. In this paper, we are principally interested in evolutionary creationism (or theistic evolutionism). The existence of a divine design in nature, the spiritual status of human beings and the emergence of human species as the purpose of evolution are some of those debates. The post-Darwinian period around 1900 is full of that kind of speculations and polemics. We introduce some of those post-Darwinian theories which are similar to contemporary creationist theories. Moreover, we note that some creationist theories which accept evolution initiate sometimes an interesting theoretical debate on the mechanisms of Darwinian evolution. Those debates concern the primacy of selection as the major motor of evolution, its gradualist aspect or the adaptationist interpretations of biological phenomena. Some neo-Darwinian evolutionists denounce an excessive 'biologisation' of some human behaviours which raises important ethical questions. But creationist theories pretend that this 'biologisation' is the sign of a philosophical materialism that would be very dangerous for our society.

Keywords : *evolutionism, post-Darwinism, creationism, gradualism, adaptationism, materialism*

Introduction

Surprisingly, Darwin employs only once the term "evolution" in his book *The Origin of Species*. It appears in the conclusion of the sixth and last edition (1872). "*I formerly spoke to very many naturalists on the subject of evolution, and never once met with any sympathetic agreement. It is probable that some did then believe in evolution, but they were either*

silent, or expressed themselves so ambiguously that it was not easy to understand their meaning." (Darwin, 1872) The potentially polemical aspect of the Darwinian theory of evolution surely explains this wanted ambiguity. Indeed, many dogmas of religious writings which were, until this theory, the only ones providing answers about the origin of life are questioned. The idea of evolution threatens the traditional belief that God is personally responsible for designing livings beings.

This article aims to clarify some important anti-Darwinian theories around 1900 (Bowler, 1983). There are many pre-Darwinian transformist theories, which have contributed to the Darwinian developments, but this article will be mainly focused on the theoretical controversies which were articulated around the Charles Darwin's writings because those are central in the history of the theories of evolution. Indeed, and according to Jean Gayon, before Darwin the existence of an evolution process was questioned. After him, the questions were about the mechanisms of evolution (Gayon, 2003). Almost all anti-Darwinian controversies are justified by religious beliefs. There are many and various creationist ways of thinking (Alters, 1999) but we will only be interested in the theories which accept the basic evolutionary principle (evolutionary creationism) mainly because all the anti-evolutionist propositions (literal and progressive creationism) solve the problem in an immediate way by denying it. On the contrary, we will show that the creationist theories which accept evolution initiate sometimes an interesting theoretical debate on the mechanisms of Darwinian evolution.

However, the creationist beliefs are still present in the United States and also in Europe. The American biologists have disregarded the creationist theories for such a long time that they did not consider necessary to speak about it or to refute their argumentations. The time of contempt and teases is over: a Gallup survey in 2004 shows that only 13% of American people accept Darwinian propositions. Thus, literature refuting creationism increases and the Museum of Natural History of New York inaugurated on 2005 the biggest exposition ever done on Darwin. In order to thwart the creationist attacks, the principles of Darwinian evolution are explained to the public and the guides of museums are specially trained to answer creationist visitors. Therefore, as European scientists, it is important to avoid the marginalization of the creationist question. Studying

all kind of theoretical difficulties between the Darwinian theory of evolution and creationist beliefs is consequently an important purpose.

I. Post-Darwinian theories around 1900

We'll focus on two post-Darwinian theories defending a theistic evolutionism, the neo-Lamarckism and the orthogenesis. These two theoretical systems have the same metaphysical base: protecting the existence of a divine plan creating and ordering the living beings. The process of evolution is considered as the unfolding of a preordained plan. On the contrary, the concept of *chance* has a very important place in the theoretical structure of the Darwinian theory of evolution. Chance leads to inter-individual variations which allow the processes of natural selection to be set up. Darwin could not explain those inter-individual variations but he knew it did occur and it is not toward any useful goal. Chance underlines the *contingency* of evolution and the very improbable aspect of human species emergence on the earth. This contingency is central in anti-Darwinian controversies. The concept of contingency has been developed by the palaeontologist Stephen Jay Gould in his book *Wonderful life*. According to him, *Homo sapiens* did not appear on the earth because an evolutionary theory predicts such an outcome based on themes of progress and increasing neural complexity. Humans arose, rather, as a fortuitous and *contingent* outcome of very numerous linked events, any one of which could have occurred differently and sent history on an alternative pathway that would not have led to consciousness (Gould, 1989).

In the theistic evolutionism system, the biological evolution manifests the divine plan of which the purpose is the emergence of human beings. These doctrines begin in the physico-theology of William Paley developed in its *Natural Theology* at the beginning of the 19th century. This theory seems still successful today since recent studies shows that in the United States, 35% of interrogated people (Gallup, 2004) adhere to the propositions of intelligent design (ID). The *Discovery Institute*, created in 1991, is entirely devoted to the propagation of ID ideas and their financial, media-related and political possibilities are consistent with their motivation. In Europe too, the theistic interpretations of evolution are not rare (Perbal et al., 2006) and at the beginning of July 2005, Christoph Schönborn, one of the most influential cardinals of Vatican close to Pope Benedict XVI, denied, in a platform of the *New York Times*, any compatibility between evolution, as a process closely linked to chance, and the catholic faith. He underlined that the theory of evolution is not itself questioned but that the Catholic Church defends the human mind by proclaiming the existence of a "design" in nature (Schönborn, 2005). Moreover, the anti-evolutionist attacks become political, particularly in the Ministries of Education, and these attacks become numerous (Italy and Serbia in 2004, Poland in 2006) (Susanne, 2004). These events show us that the historical contingency of evolution still causes controversies.

For this theistic point of view, the diversity of morphologies and adaptations in nature are an undeniable proof of divine design. But, with Darwin, this diversity manifests something else. Indeed, the adaptation is central in Darwinian theoretical construction as it is the direct result of natural selection. The adaptation of a population manifests a successful, but random, meeting between a new individual characteristic and some environmental conditions. The morphological diversity is a secondary consequence of this unforeseeable initial meeting.

Orthogenesis and neo-Lamarckism are theistic theories which question the Darwinian contingency while reinforcing on one hand, the morphological argumentation and on the other hand, the adaptationist argument.

Orthogenesis is a concept, introduced by William Haacke in 1893, which denotes a process of non-adaptative evolution. In Darwin's theory of branching evolution, similarity of structure principally indicates community of descent: the modified descendants of a single ancestor still preserve a similarity of structure inherited from that ancestor. Orthogenesis supposes that similar forms might actually belong to lines of development that had been separate for a long time and that share the tendency to vary in the same direction (Bowler, 1983, p.46). This phenomenon of convergence is also important in the Darwinian theory but it is not as central as in the orthogenesis arguments. Thus, orthogenesis tends to reinforce the morphological argumentation and to marginalize the adaptation as a secondary phenomenon: the biological evolution is mainly canalized by structural constraints rather than by adaptive processes. If one applied this concept to human evolution, it might be argued that the similarities between human and apes were independently acquired, so there was no close link between them. This progressive *canalization* makes it possible to preserve the existence of an intelligent design leading to the emergence of human beings. It is interesting to note that this concept of canalization, initially used to protect the divine plan, is still central in some actual theoretical controversies, independent of any religious purpose, on the processes of evolution (Waddington, 1942; Duboule and Wilkins, 1998). Indeed, the neo-Darwinian paradigm (Kuhn, 1970), emerging and dominating biology since the middle of the 20th century, is currently questioned. We will develop it later.

The neo-Lamarckism tends also to preserve the existence of a divine plan in nature which is a purposeful system, designed by its Creator to achieve certain goals. The neo-Lamarckism, term introduced by Packard in 1885, develops the adaptationist argumentation. The Lamarckian propositions are used again but a single aspect of his theory, as an alternative to the primacy of Darwinian mechanism of natural selection, tends to be exploited. This aspect is the inheritance of acquired characteristics. Thus, finalism is reintroduced in the evolutionary processes since the individuals are able to adapt to their environment without requiring the preliminary emergence of an individual

variation. The example of the giraffe is typical of this finalism of the heredity of acquired characteristics: the giraffes began to eat the leaves of trees instead of grass, they stretched their necks to reach the trees and thanks to the effort their necks grew slightly longer. God had created the self-designing forces of nature. Instead of being designed by an external Creator, species have been given the power to design themselves by their own efforts (Bowler, 1983, p.45). In addition, Lamarck also believed that living forms had inevitably progressed toward higher levels of organization. This progress represents the unfolding of a divine plan to create human beings.

Peter J. Bowler shows that many English-speaking evolutionists have developed these neo-Lamarckian interpretations to contest the contingency of the Darwinian evolution which does not let any place to the design of God. Finalist interpretations of evolution completely remove chance concept and are very often more accessible from a cognitive point of view, more intuitive, than stochastic Darwinian interpretations. Indeed, a lot of surveys evaluating students' comprehension of evolution indicate that finalist interpretations are very common (Bishop et Anderson, 1990; Cooper, 2001; Perbal et al., 2006). Finalism and creationism both consider chance as an undesirable host (Bronner, 2006).

The next theory has no religious origin and is not opposed to Darwinian evolutionary contingency. On the contrary and according to Jean Gayon, this post-Darwinian theory is characterized by a hardening of Darwinian propositions (Gayon, 2003). The essay *On Heredity* in 1883 written by the German zoologist August Weismann is probably its origin. This toughening consists of removing the heredity of acquired characteristics and generally, considering natural selection as the only motor of evolution. According to Weismann, natural selection has enough explanatory potential to understand the progressive transformation of species. It was considered as an ultra-Darwinian thought by the contemporary detractors and, in contrast with neo-Lamarckism, it was named *neo-Darwinism.* [1]

Those alternatives were considered as materialistic theories because traditionally, our mental and moral faculties were seen as the product of the soul, a distinct spiritual agency. Firstly, since animals have no soul, in the Christian interpretations, postulating an animal ancestry for human beings seems to deny our spiritual status. Therefore, the foundations of morality seem to be threatened (Bowler, 1983, p.1). The evolutionary creationism tends to protect these foundations with an intelligent designer. Secondly, the selectionist and adaptationist prospect of biological phenomena consider, for example, that

[1] In fact, Lamarck and Darwin accepted both the inheritance of acquired characteristics. Around 1900, Neo-Lamarckians were those who recognized this common conceptual inheritance since neo-Darwinians refused it.

mental and moral faculties have been selected thanks to their important adaptative value for human beings. These products of the soul have not a spiritual but a natural origin. This naturalism is proper to ultra-Darwinism and is still present in the contemporary neo-Darwinian paradigm. It induced the development of the sociobiology (which tends to understand the human social behaviours thanks to their adaptive values) or, more recently, of the evolutionary psychology (which objectivises ideas as *memes*, referring to a unit of cultural information transferable from one mind to another thanks to the laws of the adaptationist evolution). These theoretical developments raise important ethical questions about the principles of human autonomy and responsibility.

II. The theory of evolution, scientific theory in construction

The beginning of the 20th century is characterized by the development of *genetic* which will confirm the Darwinian propositions. Particularly, it establishes that variations within the populations result from random phenomena of mutations and genetic recombinations. The *population genetics* arises, around 1930, from the exchanges between Mendelian genetics and Darwinian theory. This is a discipline based on statistical measures, experiments in laboratories and observations in nature. Beginning with the allelic frequency of a gene in a population, it establishes the allelic frequency variations in some generations. According to the theory, these frequency variations are controlled by natural selection thanks to their adaptive value for individuals. Within the theoretical framework of this discipline, the population of individuals is considered as a population of alleles whose changes of frequency cause evolution. This association between the population genetics and the theory of evolution increases the experimental potential of neo-Darwinism. Then, about 1940, *the synthetic theory of evolution* appears. Its main propositions are formulated and organized in *evolutionary genetics* by the American geneticist Th. Dobzhansky. The systematician Ernst Mayr and the American paleontologist G.G. Simpson contribute to this construction that J. Huxley, an English ecologist, names the *New Synthesis*. Then, between 1940 and 1960, the molecular biology joins the modern synthesis to form what we call the neo-Darwinian paradigm.

This methodological and theoretical landscape of biology is really paradigmatic, as Thomas Kuhn defines it. Evolutionary biology is not dominated by theoretical polemics anymore as in the beginning of the century. An interdisciplinary theoretical consensus is established and the effective methodologies, of genetics and molecular biology, induce the development of empirical rather than speculative approaches of biological problems. The Darwinian theory of evolution, thanks to its modern syntheses, becomes the neo-Darwinian paradigm.

Despite this paradigmatic status, some critics question some aspects of the neo-Darwinian theory of evolution around 1970. Indeed, the *rhythm of evolution* is

one of those questions. The palaeontologists underline, for a long time, the absence of some transitional forms, between different species, in the fossils data. It is interesting to note that this absence of transitional forms is also an argument used by creationists in an anti-evolutionist prospect. For the palaeontologists, evolution itself is not questioned but its Darwinian gradualist aspect (that transitional forms would confirm). Therefore, two American palaeontologists, Stephen Jay Gould and Niles Eldredge, established a new theory, *the theory of punctuated equilibrium*. This theory implies a new vision of the evolutionary tree whose branches do not manifest a gradual evolution anymore but a punctuated one. Thus, periods of equilibrium, of stability are punctuated by speciation processes. The theoretical problem is not only the rhythm of evolution but also the *primacy of natural selection* as the motor of evolution. Indeed, some neo-Darwinian evolutionists defend the relevance of a hierarchical approach: a theory which recognizes the primacy of different mechanisms at various levels of evolution. For them, the natural selection remains the principal mechanism of adaptive evolution. But the genetic drift, the continental drift and massive extinctions are maybe more important, according to N. Elredge and S.J. Gould, to explain the biological diversity (speciation and macroevolution) (Gould and Lewontin, 1979).

In an ethical prospect, Richard C. Lewontin and Stephen Jay Gould underline that an improper use of the Darwinian chance-selection model implies an adaptationist comprehension of phenomena, considering that any property or characteristic was selected thanks to their adaptive value for the organism. Within this framework, a structural or behavioral characteristic must be linked to a hereditary entity allowing it to be selected and determining its development. Therefore, in the neo-Darwinian paradigm, some biologists tend quite naturally to understand these biological phenomena by knowing their genetic determinants. This adaptationist evolution induces a lot of polemics when it is applied to human beings, namely in the *evolutionary anthropology*. Firstly, the *evolutionary morale* sets up the "struggle for existence", of the theory of evolution, as a major moral principle. The social Darwinism followed this moral principle. Secondly, the *evolutionary ethic* considers that moral behaviours are not only due to the cultural history but also to biological predispositions allowing their selection. Thus, cooperation and altruism are understood as behaviours with an important survival value. Sociobiology develops this kind of arguments. It is maybe relevant concerning non-human animals but it is still ethically and scientifically debatable concerning the human species. The ethical problems involved in these questions are numerous and very interesting but it is not the purpose of this paper. However, it is interesting to note that Weismann's neo-Darwinism, emerging at the end of the 19th century and named ultra-Darwinism by its contemporary detractors, is similar in some aspects to the actual neo-Darwinian paradigm. The *theory of selfish gene*, developed by Richard Dawkins and proper to this paradigm, is often named ultra-Darwinism too (Dawkins, 1976). This *biologisation*, in a pejorative sense, of moral

principles or of some human behaviours is deeply related to a strictly gradualist and adaptationist approach of neo-Darwinian evolution. Obviously, all neo-Darwinian evolutionists do not develop that kind of biologisations but the neo-Darwinian paradigm makes it theoretically possible.

It is important to specify that Stephen Jay Gould was Darwinian and paid often tribute to Charles Darwin who was, for him, an exemplary naturalist. He was opposed to any finalism in evolution processes and narrated, with talent, the contingency of biological history of living beings involving that human beings could never exist. On this point, he is in opposition to any creationist theory. Because he was palaeontologist, far away from laboratories of molecular biology, he was not satisfied with the empirical approaches and had still given a fundamental place to the speculative thought and the polemic. Not in an anti-Darwinian purpose but to improve the theory of Charles Darwin. However, it is interesting to explain the theoretical link between the theory of punctuated equilibrium and the religious orthogenesis theory explained previously. Indeed, those two theories question the primacy of the evolutionary gradualism and use the canalization concept (which implicates that 'complexification' of the organisms imposes new constraints on internal molecular systems limiting the field of new evolutionary forms possibilities). Recent researches in development genetic tend to show the relevance of this concept.

Indeed, the key regulatory molecules and mechanisms across the world of metazoa are remarkably constant. Many conserved molecular systems play comparable general roles in pattern formation and organogenesis in animals. Denis Duboule is a researcher who exemplified this constancy with the conserved *Hox* genes and their chromosomal arrangements and expression patterns in the setting of anteroposterior pattern (Duboule and Wilkins, 1998). Thus, the diversity of animal forms is not only due to natural selection because there are many crucial underlying unities at the molecular level. Denis Duboule argues that evolutionary increase in developmental complexity is accompanied by an increase of biological functions per regulatory gene with the result that most regulatory genes in animals are multifunctional in development. Functional connectivity of genes might constrain the system internally in such a way that only few changes (mutations) are possible, it is the phenomenon termed canalization. Canalization is a concept which has been deeply and principally developed by Conrad. H. Waddington around 1940 (Waddington, 1942). Duboule notes that in his view, canalization of development reflects a developmental consequence of an evolutionary mechanism, rather than a teleonomic process as viewed by Waddington or a teleologic process as the orthogenesis.[2] He develops a transitionist approach of evolution and considers

[2] Teleonomy is the apparent 'end' or 'purpose' of processes, such as those in history or biology. Teleology is similar but connotes that an end is intended and/or striven for by a conscious agent. It is the philosophical study of design, purpose, directive principle, or finality in nature or human creations.

that evolution is neither inherently gradualist nor punctuational but progresses from one extreme to the other. Gradualist evolution is relevant for simple living organisms, as the unicellular ones. But the development of more complex organisms implicates molecular canalizations and thus, only a few of the possible variations (mutations) will be directly exposed to natural selection, contesting the gradualist evolution (Duboule et Wilkins, 1998). Even if the orthogenesis has the religious purpose to protect the possibility of a divine plan, in opposition to the theory of punctuated equilibrium and to the transitionism, it is interesting to note these common theoretical references. The scientific debate is still open.

III. Evolution, materialism and religions

This long deflection on the actual theoretical status of evolutionism seems important to us for several reasons.

Firstly, it shows us that we are not in the field of *credo*. The theory of evolution is a scientific theory: it is confronted with facts and has to be questioned and improved. It is falsifiable. Then, it is useless to oppose science and belief because the theist theories do not apply the principle of *falsifiability* (Popper, 1959). The metaphysical postulancy of divine design cannot be confronted with facts of the physical world. Of course, the construction processes of scientific theories are complex and the researchers are not absolutely objective in front of facts. The history of sciences shows that they can persist in aporetical theoretical ways but they really tend to preserve this anchoring in the physical world which will inevitably lead them to the construction of a new theoretical system. Theistic theories, like Intelligent Design, pretend to be scientific but their metaphysical postulancy brings them well beyond the physical world. It is a question of faith.

Secondly, this questioning of gradualist and adaptationist evolution deals with many ethical consequences for human beings. Indeed, approaching organisms with systemic terms and underlining their structural constraints questions the relevance of purely reductionistic approaches of living beings. The development of a character is not often determined by simple genetic determinants. The systemic constraints strongly contribute to this development and understanding these contributions is also fundamental. We do not wish to develop the ancestral debate opposing holism and reductionism but we want to point that the neo-Darwinian paradigm, dominating biology at the end of the 20th century, currently undergoes large conceptual modifications which tend to dilute any strict genetic determinism. For example, the ethical, moral or altruist behaviours of human beings cannot be approached only with the single genetic reference as in the evolutionary ethic of some sociobiologist researchers. Surely, those sociobiologists do not think that knowing genes is enough but they sometimes seem to forget that human beings are an animal species whose individuals are

free to make their own choices. It is probably an obviousness but the phantasms on "totipotency" of genes appear still quite present to us in the collective mind. Of course, this freedom is quite relative and the behavioural, biological or social predispositions cannot be denied but the autonomy and responsibility principles are still properly human principles.

These first ethical consequences lead us to the third reason for which it was important to explain the theories of evolution. Indeed, the *Discovery Institute*, about which we spoke previously, has established the *Wedge Document* which describes the various strategic steps of creationists' struggle against evolution. « *The cultural consequences of this triumph of materialism were devastating. Materialists denied the existence of objective moral standards, claiming that environment dictates our behaviour and beliefs. Such moral relativism was uncritically adopted by much of the social sciences, and it still undergirds much of modern economics, political science, psychology and sociology. Materialists also undermined personal responsibility by asserting that human thoughts and behaviours are dictated by our biology and environment. The results can be seen in modern approaches to criminal justice, product liability, and welfare. In the materialist scheme of things, everyone is a victim and no one can be held accountable for his or her actions*."[3]

Of course, there is a fundamental difference between philosophical materialism[4] and methodological (scientific) materialism[5]. But the authors of the *Wedge Document* do not see any difference. According to them, the root of philosophical materialism is the scientific one and thus, it is necessary to destroy it first and particularly, the Darwinian evolutionism.

The drifts of some deterministic and anthropologist interpretations of biological phenomena, whose questioning is legitimate, are used as anti-Darwinian arguments. For this purpose, the concepts of evolution are really manipulated and disguised. The following text referring to social Darwinism is an absurd example of those devious uses: *"Actually, when Darwinism is taken away, no philosophy of 'conflict' remains. The three monotheistic religions that most people in the world believe in, Islam, Christianity and Judaism, all oppose violence. (…) However, Darwinism sees and portrays conflict and violence as*

[3] The Discovery Institute, *The Wedge Document*, http://www.antievolution.org/features/wedge.html.

[4] Philosophical materialism (physicalism) is the metaphysical view that there is only one substance in the universe and that substance is physical, empirical or material. Materialists believe that spiritual substance does not exist.

[5] Methodological materialism refers to the long standing convention in science of the scientific method, which makes the methodological assumption that observable events in nature are explained only by natural causes, without assuming the existence or non-existence of the supernatural, and so considers supernatural explanations for such events to be outside science.

natural, justified and correct concepts that have to exist. For this reason, if some people commit terrorism using the concepts and symbols of Islam, Christianity and Judaism in the name of those religions, you can be sure that those people are not Muslims, Christians or Jews. They are in fact social Darwinists. »[6] That kind of text should not be quoted but it is often used as reference by numerous young believers looking for answers…

Conclusion

Ultimately, it is important that European biologists pay attention to the creationists' drifts but it seems also quite essential to be attentive to the drifts of evolutionary anthropology because these abuses feed themselves reciprocally. And it is the whole biologists' community which is taken hostage.

The *Intelligent Design* disputes the possibility of a chance-selection evolution. The complexity of organisms seems so important that it has to be the product of a divine plan. However, it is not necessary to postulate an intelligent design. Denis Duboule, and many others, tends to understand this complexity using scientific and necessarily materialist methodologies.

Finally, the anti-Darwinian ideas are almost identical to those at the end of the 19th century but the actual debates are not only speculative and have become political, in the United States but also in Europe. This political prospect is not insignificant and the attacks mainly concern the teaching of evolution, which is unacceptable. It is very important to realize that this problematic not only concerns evolution, it initiates important debates concerning beliefs and the neutrality principle of education.

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An Analysis of Breast Cancer over Avon Public Relations Campaign: "My Breast was Cancer, Not Me!"

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Abstract

Body is not a natural, but a social/cultural fact and so it is important to decipher this fact in which sexist/class/technologic/cultural power statements are grew, to undertstand projections of this fact. Some concepts like appearance (beauty, cosmetics), health/illness and hygiene which show periodical differences during history, are one of the most important evidence that women body is a cultural/historical project. Nowadays, as a consequence of the tragic fact of breast cancer, on one hand, women fear from their breast and see it as a potencial enemy, on the other hand they realize the fact that the breast is their and it enables them controlling their body completely. Shortly, paradoxically, this paves the way for women adopting their own bodies through a tragic way (Yalom, 2002: 281). By an application called *Mastectomy*- under general anesthesia unit, all breast configuration is being dislocated. This application comes to mean of mutilation of most of woman body. The aim of this work is setting up the discussion of carrier slogan "my breast was cancer, not me!" from the background of the problem which is the conceptualization of woman body after mastectomy that stems from breast cancer that is evolved in the outline of the works of struggling with breast cancer that is the basic of "Travel to Health with Avon" of Avon's public relations campaign. The answer of the question

which the meanings of that slogan "my breast was cancer, not me!" refers to limited/integrated body perceptions that we come across as the words of a person who struggles with breast cancer and defeats this illness as mastectomy is looked for in the outlines of expressional historical and conceptual that are supplied by discussions of body policies.

Keywords: *Breast cancer, public relations, discourse*

1.Introduction

As Falkheimer (2007: 290) indicated that, essentially, public relations has a communication process which is dynamic, ideological and related to time and place. Public relations focuses on a communication based upon some meaningful rituals. Social reality is constructed once again in this shared meaning and focus based upon constructing meaning. Public relations should be analyzed over discourses it produces as an ideologic communication power which has a power that can cause different results.

Foucault explained that discourses are "governed by analyzable rules and transformations" and can be identified according to the rules of formation for all of the objects, concepts, subjects and strategies within the discourses. These rules constituted 'systems of thought' that determined what could be said, who could speak, the positions from which they could speak, the viewpoints that could be presented, and the interests, stakes and institutional domins that were represented. A discourse inquiry leads to the following problematization-what is public relations and how is it that we have come to think about public relations in this way? From a discourse perspective, the starting point for analyzing this problem is to conceptualize public relations as a meaning creation process with ideational, relational and identity functions (Motion and Leitch, 2007: 264).

Within this abstract frame, as a part of fighting breast cancer the campaign discourse of Avon which carried out in Turkey will be analysed over slogan and a published text within campaign. And so, it will be analysed how this discourse concerning woman body is produced over public relations application.

1.1. Academic Discussions over Biological Body- Social Body Contradiction

Mind/body distinction that receives its ideational basis from Cartesien view, gives a quite different place to mind, on the other hand, body is seen as a part of external world and it is given a secondary status. According to the organism body which is an extend of Cartesien view which brings into prominence the biological side of body, the body is a machine which is formed by God.

According to social structuralists who are against the point of view that the body is entirely a biological being, the body is shaped, bordered even reconstructed by community. Qualifications, meanings and bodily restrictions which are accredited with body are social products. According to Foucault, one of the most effective philosopher who think that the body is constructed socially, the body - beyond biological existence- has a position at the center of power/knowledge relations. The body with which delectation, intelligence and power is being dealt along social anaysis is social conflict area; owing to knowledge and power, the body's production and regulatation is of concern. In order to prove his theory Foucault analyzed sexual and medical discourses and some institutive disciplines like medicine, education and prison. Capitalizm shapes the body through bio-politics that means taking the medicine discourse and applications under control (quoted by Nazlı, 2004: 26-27; Çubuklu, 2004: 109).

One of the philosophers who call attention to the social aspect of the body is Norbert Elias. Elias, who analyzed Western communities' civilization process, focuses on civilization and rationalism of the body. The main aim of Elias is to display the role of community and interpersonal interactions on shape of the body and to show that physical habits, physical technics and, consequently, it changes body's external appearance. Discriminating between civilised body and animal body, Elias argue that contrary to animal body, civilised body has got through the processes of socialization, rationalization and individualism. Accomplishing its natural functions disguisedly and becoming a center that reflects behavioral codes anymore, defines the socialization of the body and, rationalization of body include taking under conrol the stimulations and emotions consciously. Civilizing process rationalizated the bodies, to some extend, individuals have more control capacity over their own bodies, at the same time, they are exposed to more social pressure in order to control their bodies (Nazlı, 2004: 27; Yumul, 2000: 38). Also according to Bourdieu the body has an important place for social classification. Each individual, attendently, each social class has its own different physical healt, beauty and aesthetic thoughts. These differences are not only based upon social classes, but also are based upon sex of individuals. Turner also argues that the representation of the body in public sphere which based upon spesific economic, politic, cultural and social prosesses should be evaluated (Nazlı, 2004: 27-28)

The rationalization of the body makes the life safer, at the same time, it uniforms the life and makes it less exciting. From this aspect, it reminds of Weber's rationalization process. Just like barring people, this process supply individual control and civilization but body's civilization never 'completely takes it from pain, always leaves a mark'. With individualization of the bodies, individuals see themselves detached and different from other people. Interval is created between bodies and anymore, human body is transformed into a dishonor. Body and personality are perceived differently anymore, and body begins seeing the

function of a case embodying personality. This body not only embodies surrounding nature but also it embodies its emotion and attitude, fear and motivation. By this way, it brings in the competence of proceeding along and behaving rational. Borders that diverge social and natural areas of individualised body are thick (Yumul, 2000: 38). Degrading interrelations between individual and community that are achieved from inner operation of body contributes the continuity of arrange. An individual whose contribute to environment is limited never can be released from a particulative-complete trap. After all, an organismic trap aims such an adducent (Cirhinlioğlu ve Mutlu, 2002: 11).

According to Turner along with postmodern times, compared to earlier ones the body, is more dealt with in its social atmosphere. On the other hand, at this times the body was particulated mostly, got a lot of identities and anymore could neither be protected nor has a staunch identity. A divided society is the cause of producing a divided body (quoted by Çınarlı, 2004: 27).

1.2. Configuration of Producing Dominant Ideology over Healt Discourse by Media and Public Relations Activities

As it is stated by Burton (1995: 168), the dominant ideology is the dominant viewpoint in a given culture and a great majorty of modern-day media presents this viewpoint. For instance by this way, some values like that familiy or rule and convention are good things, or if you support rule it can be used force, or saving money and possession are good things, or affection and bravery are good aspects are given. Also in most of the definitions accredited to public relations discipline, there are approximately the same approaches in order to ensure legality of the discipline whose definitions include 'good faith', 'mutual understanding' with its environment that no one can deny its affirmativeness. Such attempts of definitions are involved in organisation- administration-centered definitions. On the other hand, another definitional approach as explained by Moloney'in (2000: 6); goes towards to explain the affections of public relations on society and it is an approach that sees public relations as special lobby studies of some groups who want to improve their material/ideologic struggles by convincing the public through mass media.

When we analysis public relations definitions from a social perspective, we can say that these definitions can be included in a category which uses persuasive mass media by public policy and have the power of improving their material and ideological benefits in political economy. Beside the definitions when we look at application areas of public relations, for instance, in England we see that public relations is used by governments, monarchies, churches, business environments, interest and pressure groups. Public relations takes on the task of enhancing ascendancy and solving problems of some groups. This effort combines with liberal, democratic, capitalist and market-centered economies and this is a communicative result of this system (Moloney, 2000: 60).

Capital owners, using varied communication media affect people and disport their bodies freely. 'aesthetic, athletic, thin, well groomed body' seem like the desire of who direct capitalist economy more than the owners of it. Because, such concepts at the same time will mean fueling or creating consumption on account of the money which the individual reserves for sport, diet and care materials. Modern body concept really becomes the body concept of consumption society. The government, with the point of Foucault, restructed itself again during this process (Cirhinlioğlu and Mutlu, 2002: 354).

Health care, recently, goes through the process of 'becoming meta' and 'becoming thing' that is immanent in capitalism both in the world and in Turkey. To exclude health care from the integrality of which it was a part before in order to purchase and sell in the market, to fold it with a new description; to make social cogitation experience become immanent to this new description, in other words, to convert buying and selling of health care in the market into 'wide open' form the process of 'becoming thing' (Özdemir & Özdemir, 2006: 33).

Mass media mends the nets of data, attitudes, habits, institutions, equipment and organization in a complex mutual dependency again which neo-liberal politics controlling capitalism, increasing and intensifying inequality of income, social security expenses being cut rigidly, social politics disappearing render possible for health to be an individual right not collective right. Mass media in Turkey provides individual description of health, discusses individual choices to have health care, tries to explain health problems with individual life styles and thus puts forward the individual terms; on the other hand, it puts limitations and restrictions to the more general and social descriptions of health and health problems. While the news "She won the battle with cancer" is often repeated in the media, health is imagined as to struggle individually not to demand as a collective right (Özdemir & Özdemir, 2006:33)

1.3. Metaphoric Experience of Breast and Cancer

The social identity of women, for quite a time, has become conditioned by the understanding of their body with their culture. The attitude about body has dominated on the lives of women as well as the specific gender definition of their community (Grieco, 2005: 53). Sontag traced the metaphors of illness like AIDS, tuberculosis and cancer in his book named as "Illness as Metaphor and AIDS and its Metaphors" (2005). Some illness are described to bear on the soul while some on the body. For example, being cancer is disgraceful whereas illness like tuberculosis are portrayed as illness that romantic, noble and sensitive people suffer from. The differences between the meanings assigned on breast on women's body are a specific example of this matter. Recently, on the

basis different voices come together, women start to freely talk about their breast. The phenomenon how a woman looks at her own breast is an important sign of individually her own self-respect and generally her social status. Breast from the perspective of people outside shows another reality; this reality carries different meaning in the eyes of each observer. Religious authority converts breast to the spiritual symbols, and politicians adjust them to national targets. Psychoanalysts place breast in the center of unconscious as if it was a monument which never changes. The variety in these all meanings signs breast's privileged part of human's imagination. At any times of the history, one of these meanings gets ahead and starts to dominate our perspective. The breast attached to the motherhood at the end of middle age was, first time in the history, transformed to a common symbol of Christian training. Two years later, Renaissance painters and poets changed its religious importance to eroticism. 18th century-European philosophers saw breast as a source of citizenship. At the present time, in America at the early 21th century, the word "breast" marks the reality of breast cancer in mind that is valid for both man and woman (Yalom, 2002: 281-282). Breast cancer is the most common illness amongst women and the rate of ending with death is high. Among the most important factors that cause breast cancer, there are pollution and chemical elements used in agriculture (Özlen, 1996: 97).

Today, the tragic truth of breast cancer presents woman opportunity to controlling their breasts completely. With the shock of this mortal disease, they learn their breasts really belong to them. Sometimes these women's husbands, lovers, parents and friends leave these women when they get sick. However, paradoxically, breast cancer has an inspiring aspect. Struggle with the illness shows that it is not always mortal and, good nursing and support can provide great changes (Yalom, 2002: 282-283).

As Yalom points out (2002: 285, 237); as a timeless descriptive of sex, life and nutrition, breast has to fight with the contrary meaning, illness and an origin of death. With this meaning, it is extremely low possibility for breast to be a symbol of relief especially for women. Women begin to fear from their breasts, to see them as a potential enemy, and sometimes to have to struggle with their mortal gens inside. At the present time, for most people, breast cancer is a catalyst that causes transformation of the method to conceptualization and above of all the things to see it as a health problem. The fact of seeing breast's medical aspect increasingly causes danger to extinguish its aspect of motherhood and eroticism. Besides, for last 150 years, suggestions came up with for the struggle with breast cancer unites on that early diagnosis saves lives and all women need to have their breasts regularly controlled. One of standard procedures in early diagnosis is mammography, special X-ray which can reveal the littlest tumors in breast. To prevent from breast cancer, it is pointed out that women whose ages are between 40 and 49 have to screen in mammography every year or once in two years and that giving birth at an early age and breast-feeding decrease the

risk of breast cancer. These new emphasis on the methods of prevention from breast cancer have women face with the feelings that they are responsible somehow when they get the illness. While past times-women thought that the stability of the body liquors, their breast being injured after an accident or God's curse caused breast cancer, today's women are increasingly having the feeling guiltiness about the illness. Once religious and scientific explanations supposed that breast cancer originated from reasons out of people's control; today, if we change our life style, the possibility of disease's progress can be decreased.

2. Methodology and Research

In this study, the relationship between breast cancer and personal responsibility on women in the texts in the struggle campaign with breast cancer that Avon leaded in Turkey will be interrogated. First, activities of Avon and its organizing system are investigated, and then the activities and texts arranged during this campaign are analyzed.

2.1 Avon and the Struggle Campaign against Breast Cancer in Turkey

Its head office in New York, Avon describes itself as the biggest direct cosmetic trade organization. The number of working women in Avon is more than all the organizations in the world. However, it is clear that this situation-universalizating the job being closer to their houses, independent from the factory, working over advance premium without insurance and payment- makes examining the working conditions impossible, increases works off the record and decreases the production cost (Wichterich, 2004). This and situations likewise result from welfare state losing its political powers.

Avon annually achieve more than 7,7 billion dollars sale with over 4,9 million sale agents in 100 countries in six continents. Avon remarks that all the packages of Avon products are recyclable and harmless to environment, it hasn't been experimenting on animals since 1989 and it is the first company that has ended such tests. Benefits of being a representative of Avon can be summed up as these; women know new people joining into a new social atmosphere; they buy their own cosmetic products at a cut-price; their knowledge about make-up and skin-care increases; and it provides opportunity to make progress and flexible working hours. Moreover, the leaders of a group have premium for their group members' performance (www.avon.com.tr).

Since 1992, 450.000.000$ have been collected during "the Struggle Campaign against Breast Cancer" that Avon has been carrying out in 50 countries. "Kiss Goodbye to Breast Cancer" works in Philippine, one country the campaign is carried out in, won the award of Philippine Public Relations Association (Panol, 2006: 290). This campaign carried out in Turkey is conducted as "Project of Journey to Health with Avon". Among the activities in this campaign, there are a

parade where special pink dresses appropriate to the concept of struggle against breast cancer and Spring/Summer Collections by Dilek Hanif (2005) are displayed; and seminars conducted in İstanbul, Ankara and İzmir whose subject consists of health, nutrition, psychology, caring and beauty; free mammography screening; walk whose aim to take attention to the subject; and the book "My Breast is Cancer, not Me"(2006) aiming at increasing consciousness about the breast cancer and the importance of early diagnosis. Financial stand-by of the campaign is from the pencils, teddy-bears, gold and silver rosettes, gold and silver key holders sold for the campaign and from the income received from the activities hold during the campaign.

2.2 The Analysis of Campaign Slogans and Texts

Julia Kristeva defines the relationship between women and culture, history with the term 'abject' whereas Luce Irigaray protest against the meanings distorted by modern thoughts and connections between women' body and its liquor. Body finds its nature experiencing all these loses. For both philosophers, body and even its fall-outs are necessary for women. It is obvious that divisive-exclusive-alienative understanding in "My breast is cancer not me" is totally different from the supplemental understanding. Rejecting our organs so easily when they have cancer is a product of apprehension of the reality -about the apprehension of body- that is changeable and historical. Another projection of this perspective is also in pornography. The body of women as a subject/object of pornographic works is sterile, healthy, faultless and immortal; doesn't bleed, hurt, get tired or sweat. The body is always to serve to the scopophilic and fetishist aptitude of adults/ audience.

According to R.W. Connel, the reason of exaggerating the difference of social practices in dressing, garnishment and else is directed to protect and keep the social description of gender. While the slogan of Avon's struggle campaign against breast cancer serves to spread the ideology of creating bodies under domination, it also brings the process to renew the image against all blaming that a cosmetic company can face in the world of image.

The research undertaken by ABD National Professional Security and Health Institute in October 2002 uncovered that cosmetic products contain more than 800 harmful chemical elements. After the survey on the 2.983 chemical elements used in cosmetic, 884 of these were determined as toxic (poisonous). 774 of these cause poisoning at high degree, 146 to tumor, 218 to anomaly in procreation, 314 to genetic mutation, and 376 to eye and skin ailments. By the way, it is recorded that cosmetic products may cause diseases such as bladder cancer and leukemia; and the risk that women who use hair dye catch these illness is 70% higher than those not using. At the same time, chemical elements existing in perfumes are determined to cause anomaly in nervous system, breath disorders and allergic reactions. Ketone commonly used in cosmetic products

and those containing xylene may tend to cause cancer (http://satirarasi.wordpress.com/2006/09/07). Results of all these researches point out that the products of cosmetic companies threaten our health. On this matter, because cosmetic companies cannot change the ingredients, they hope for help of image campaigns in order not to lose their place in the market. For example, they have put in great effort in using words about health and cosmetic together to produce contrary expressions to accusations. Because how it is said is as much important as what is said and the words produced change its contents and perception.

In the last episode of the book "My breast is cancer, not me", writings of famous women successful in their own professional, each of whom is voluntary in campaign, take place. Given an eye to some of these, it is seen that the great responsibility is burdened to women. For example, some role models for women in Turkey say these: Ayşenur Yazıcı "If you don't screen in mammography, your children will be orphans." (s.153); Güler Kazmacı "Don't be afraid of cancer, afraid of being late" (s.158); Tuluhan Tekelioğlu "Breast cancer doesn't kill in early diagnosis… don't hesitate to touch your breasts and examine." (s.163); Handan Güçyılmaz "Dear employees of Avon takes an important step, thinks our internal health as well as external… As breast cancer is a type of cancer that can be the most easily screened and whose early diagnosis saves lives, it is up to you to cope with… the early bird catches the worm. For early diagnosis, THE DECISION TO TAKE IS ON YOU." (s. 165-166; emphasis is original).

When all these expressions come together, struggle against breast cancer is all left to women. And not realizing being caught to cancer is thought to be based on neglectfulness, ignorance, irresponsibility. In these writings, the reasons of cancer are never questioned, only stress is determined as a factor to trigger, and to get rid of this is up to person's will and responsibility. There is no need to emphasize that cancer is not linked to the cosmetic products, chemical agricultural materials-that is industrial chemicals- and pollution. As Yalom (2002) states, this expression is the same for 150 years and control of diseases including cancer is on the shoulder of individuals.

3. Conclusion

With the all above expressions, it is necessary to explain that the body is a social/cultural phenomenon; and thus, the duty of the opposition is to decode the racist/ classified/ technologic/ cultural expressions of power produced in the body.

Mickey (2003:3) states that public relation campaigns contain empirical data that

can be examined as material applications. These materials can be a video, a speech, press release, or brochure. All of them can be examined with some theories carrying social, individual, social gender, potency, and racist value. Deconstruction about public relations requires to question why and for whose comfort or other things about material. It is possible to deconstruct public relations in many ways: interviewing with the person conducting the campaign, asking the target mass of the campaign what message they get. Mickey (2003) applies the cultural studies apprroach and explains how it can be used as a critical theory for public relations practices. Public relations generally search for a perspective related to problem solving and doesn't seem to criticize its own with a self reflective approach.

Questioning the style of accepting and producing expressions especially in the area of health is significant to convey the appearance of potency and to comprehend the function of producing style in public relation campaigns.

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