

**Regional Consultation on Science Ethics and Scientists' Responsibility
for Latin America and Caribbean
30-31 May 2006, Belo Horizonte, Brazil**

Objective and background of the meeting

The main aim of this meeting was to accomplish the mandate given to UNESCO by the General Conference in its 33rd Session in order to “pursue reflection on the question of science ethics”, through a series of regional and national consultations on scientists' responsibility and codes of conduct organized with the support of the World Commission on the Ethics of Scientific Knowledge and Technology (COMEST) and the National Commissions and Permanent Delegations in different regions worldwide. A report of the activities of COMEST in this area shall be submitted by DG to the Executive Board at its 175th Session in September 2006.

On the kind invitation of the Secretariat of Science and Technology of the Minas Gerais State (SECTES), Brazil, and in the framework of the celebration of 20 years of the Secretariat and 30 years of the Research Foundation of Minas Gerais (FAPEMIG), a regional consultation for Latin America and Caribbean took place on 30 and 31 May 2006, in Belo Horizonte. All Member States from the region, observers from other regions as well as relevant intergovernmental organizations and scientific organizations, were invited to take part in the meeting.

First Day

Opening Session

The Secretary of Minas Gerais State for Science, Technology and Higher Education, **Mr. Paulo Kleber Duarte Pereira**, welcomed the members of the table and the participants, and highlighted the importance of this event in the framework of research activities in Minas Gerais State and in Brazil as a whole. He briefly described the institutions that form the Minas Gerais system of Science and Technology and their relationship with public and private sectors. On behalf of Minas Gerais Governor, Mr. Aécio Neves, he thanked those present.

The President of FAPEMIG, **Mr José Geraldo Freitas Drumond**, placed this event in the frame of the celebration of the 20th anniversary of FAPEMIG, one of the most ancient funding agencies for scientific research in Brazil. He mentioned that Belo Horizonte is the largest biotechnology pole of Latin America after Sao Paulo, having an important scientific community and private companies investing in research. He also emphasized that the development of the State of Minas Gerais is strongly science-oriented, therefore its interest on the subject of ethics of science and technology and the relevance of hosting such a conference. He illustrated FAPEMIG's commitment to ethics, highlighting that it always requests ethics protocols in order to provide grants to research projects.

Mr. Everton Frask Lucero, representing the Ministry of Foreign Affairs, recalled the relevance of this debate, especially the fact that science development should revert to a higher quality of life for all, instead of benefiting some groups to the prejudice of others. He also mentioned the 3rd Ordinary Session of COMEST, which took place in Rio de Janeiro in December 2003 and debated on the consequences of scientific

research on human beings, sustainable development and the opportunity of elaborating an ethical code of conduct for scientific activities. He quoted as a starting point for the debate the Rio de Janeiro Declaration on Ethics, Science and Technology, which was approved during a Ministers meeting held in parallel, and the Universal Declaration on Human Rights and Bioethics, adopted by UNESCO. He underlined however that the Brazilian Government was not able to take a position at the moment, for this was a consultation meeting. The intention of extending the debate is a multidisciplinary task and the Ministry of Foreign Affairs is in charge of coordinating positions on ethics and science in order to, when necessary, participate in international forums. He expressed concern about the adoption of the Recommendation on the Status of Scientific Researchers of 1974 as a reference document for future consultations, since it was elaborated in a context far different from the present one.

Mr Manoel Barral Netto affirmed that science changes traditional knowledge, leading to cultural and human impacts. He mentioned stormy debates of the past, about earth's shape, the intervention of church in scientific issues or the emergence of medical science, which became really "scientific" only in the last hundred years. He recalled that unacceptable experiences with human beings, like eugenism, had already been done, and that it was necessary to reflect on science development not only in its ethical aspects, but also in terms of human relationship. Finally, he stressed that his presence at the meeting testifies the Federal Government interest in the debate.

Mr. Luis Hildebrando Pereira da Silva, COMEST member, highlighted the great responsibility that fell on the participants of the meeting. They should present propositions for the elaboration of a universal ethical frame, which would be the base for possible codes of conduct for scientists. He recalled that during the seventies humanity was concerned with nuclear weapons, afterwards, with climate changes and, more recently, with cloning, especially human cloning and genetic engineering. He underlined that society's opinion respecting mammalian cloning was clearly and widely negative. He also drew attention to the existing difficulties to detect ethical contents and cultural references in the development and the practice of science. In India, for instance, due to religion reasons there is no ethical problem related to human cloning. He noted that it is necessary to adopt a conscientious attitude and, at the same time, to respect the development of research that is useful for society.

Mr. Carlos Alberto Vieira, on behalf of the Director of UNESCO Office in Brazil, has symbolically invited the women to also participate in the opening table of the meeting. He said he has been working in the area of human rights related to ethics and science for some years. He underlined that Brazil has the 5th population in the world and the 8th largest economy, but is only the 63rd in terms of Human Development Index (IDH), an uncomfortable situation that illustrates Brazilian social inequality. He recalled that many steps would have to be made, by means of ethical principles, before science and technology could effectively contribute to improve life's quality in Brazil and in Latin America.

Session on Ethics and Science

After having welcomed the participants, the moderator, **Mr. Jacques Schwartzman**, Deputy Secretary of Minas Gerais for Science, Technology and Higher Education briefly introduced the participants of the session and started the works. He invited former Ambassador of Brazil to UNESCO, and former Minister of Science and Technology, **Mr. José Israel Vargas**, to address a keynote speech.

José Israel Vargas gave a brief historical view of the ethics of science, explaining the relationship between ethics and science in different cultural contexts, and affirming that it would be rather long to enumerate the many scientists and humanists that had contributed to science, devoting their lives to humanity. He especially mentioned Paulo Berredo Carneiro, Brazilian scientist and diplomat, member of the Executive Board of UNESCO for more than 20 years, who had contributed to introducing science as an essential component of UNESCO activities. UNESCO itself had been founded in 1946, in a context of deep distress before the serious violations of ethics of science during World War II, like the holocaust and medical experiences with human beings. Vargas recalled that, though being a positivist, Paulo Carneiro believed in human solidarity based on ethics and morals. He highlighted that Brazil, through two eminent scientists, Paulo Carneiro and Carlos Chagas Filho, was at the origin of the Recommendation on the Status of Scientific Researchers of 1974. According to Vargas, this Recommendation is premonitory since it affirms the necessity of developing actions to draw attention to, and, in the political-diplomatic level, to set up programmes and appropriate institutions to tackle the disturbing impact of new (and old) scientific findings and human action on the environment. He underlined relevant and pioneering UNESCO actions, such as MAB programme, the three Declarations on Bioethics, the creation of the Bioethics International Committee and the creation of COMEST, that broadens the area covered by the UNESCO programme of ethics of science and technology. This document is undoubtedly a starting point for this meeting, but its approval by UNESCO was only possible at a specific international context of peace, favourable to mutual understanding after the end of Vietnam War. This historic moment led to the First International Science Conference under the auspices of ONU, which was chaired by the Brazilian scientist Carlos Chagas Filho. It was then decided the creation of an advisory board in the framework of ECOSOC devoted to drawing up policies about the role of science for development. Actions were taken at a high level by the General Assembly of ONU, and, in 1979, took place the International Conference of Science and Technology for Development – the Viena Conference – that would adopt the “Action Plan of Viena” and the Declaration “Science and the Future”. Viena’s meeting was followed by the creation of an “*International Advisory Committee for Science and Technology for Development*”, initially coordinated by Brazil, that organized several panels about important emerging issues and published the “*Advanced Technology Alert System*” (ATAS) newsletter. This publication aimed at diffusing negative and positive aspects of technological development. For Vargas it would be advisable that COMEST revive such initiatives. Still referring to 1974 Recommendation, he recalled the essential role of multinational companies for scientific production nowadays, which led UN to set up a department on multinationals that aimed at elaborating a code of conduct addressed to them. Besides, present conditions of international trade prevent or create difficulties to the free circulation of new findings, as well as the adoption of ethical codes of conduct to regulate them. He underlined that the present competition for patents is a real obstacle for ethics. Although they originally aimed at rewarding individual inventors, they progressively became a source of profit for laboratories, including public laboratories, which fund their scientific activities with specific contracts. On the other hand, they gave birth to competition among scientists, leading them to keep secrets, therefore not diffusing their findings, first condition to the advancement of science. Science at the service of humanity and universally accessible became an impossible ideal. These are some evident barriers to the implementation of ethical codes of conduct that must be overcome. But, despite these barriers, we are here, contributing to elaborate a code of conduct for science. We should recall, after the two World Wars, concrete initiatives

were launched in this direction, which unfortunately failed, in spite of the UN efforts. After the Cold War, there was a hope that the huge investments made in weapons race would revert to promoting economic and social development through science. But, instead of the two nuclear poles of the past, there are now nine new poles professing different political, and above all religious, views. This reality must not be ignored when we examine the evolution and the present situation of the relationship between science and society. We must also note that whereas science is universal, its practical applications are part of cultures with opinions, behaviours, and, consequently, values that are extremely varied. Relationship between individuals and between people and nature has always been ruled by “behaviour invariants” resulting in codes of conduct for the protection and survival of the group. The ethical prevalence of “must be” turned into law, spread over the West. Scientific approach is the search of “what is”, of what really happens in the Nature, and is the bases of scientific knowledge and method, that seek truth and scientific laws, which are themselves partial and temporary. While universally adopted and democratically questionable, they rule above cultures. This stimulated the emergence and the expansion of networks of scientific communities. According to Bronowski, outputs of science and technology do not belong to science, but to society, that can use them for good or for evil. So, decisions depend on society, on its “behaviour invariants”, on the ethics that prevail in that culture. There is an aspect of scientific activity and outputs that suggests an increase of concern among scientists with the application of their findings. Actually, the touchstone of a new theory is its capacity of anticipating new facts, in other words, in “foreseeing the future”. Since these anticipations may reveal some disagreeable or dreadful facts for society or nature, scientists and the scientific community must warn society so as to fix limits to scientific investigation and its applications. In these cases the precautionary principle should be employed. But this capacity of anticipation is frequently impracticable due to the time gap between a finding and its application or to the unforeseen consequences of a dreadful finding. An example is the discovery of *laser* (“Light Amplification by Stimulated Electromagnetic Radiation”), originated in Einstein and Bose’s research. Einstein had not expected that, neither optic laser benefits, which was created forty years after he formulated his theory, or x-ray lasers – which were developed during the “Star Wars” defense plans. Is Einstein responsible for this? he asked. According to Vargas, this example shows that it is essential to warn society about the difficulties of anticipating latent dangers. This also weakens the notion of precautionary principle that is frequently invoked in an attempt to control scientific research. Scientists, who are also social beings, must and have to get involved with what “must be”, respecting codes of conduct that compel them to warn about undesirable outcomes of their findings. It is up to scientific community to apply the precautionary principle not to avoid the truth, but to warn society, because society is the ultimate owner of the progress of science. UNESCO initiatives are undoubtedly very laudable, but they will not be useful if States do not agree to control nuclear weapons and its proliferation. The refuse of some countries to adhere to the NPT Agreement and, for those that had ratified it, to respect it, as well the necessity of disarming the members of the “Atomic Club” must receive special attention. Ethical problems rose by biotechnology and by the information and communication technologies (ICTs) worth nothing if humankind disappears. Vargas called on resistance to the concentration of power, to inconsequent populism, to the disrespect of international treaties and protocols, to religious fanaticisms, to new forms of nationalism. He ended his speech hoping that UNESCO meetings would allow COMEST and ICSU to carry on also a successful implementation of Budapest Conference Declaration on Science, and that UNESCO would elaborate the ethical frame for future codes of conduct for scientific activity. For him, these principles will be efficient only if society effectively adopts them. As there is no applied science

without science, there is no ethics of science without a new and universal ethics of society.

Mr Matthias Kaiser, Director of the Norwegian National Ethics Committee for Science and Technology (NENT) referred to rights and responsibility of science, based on new ethical guidelines in Norway (see attached the presentation). Both internationally and in several states, there is an increasing attention to ethics of science, from the end of the 1980's and beginning of 1990's, said Mr. Kaiser. He then described the Norwegian situation. Norway has established three national committees: medical research (NEM), social science and humanities (NESH), and natural science and technology (NENT). Comprising internal ethics (within scientific community) and external ethics (co-responsibility for consequences), these institutions are observatory for new developments; stimulating public debate, informing the scientific community, advising the government. These initiatives in Norway were consistent with other contemporaneous international initiatives: the new social contract for science proposed by Jane Lubchenco (AAAS 1997); the ICSU/SCRES background document to the World Conference on Science (WCS); and WCS in Budapest 1999, when ethics loomed large throughout the whole conference. In Norway, on the request of the Ministry, new ethical guidelines for research in science and technology were approved in December 2005, modelled upon comprehensive international discussions. They contain a specific chapter regarding on one hand global responsibilities, the focusing on human rights, sustainable development, peace, democracy, equity and fairness in wealth and information globally; and on the other hand good research practice, such as honesty; individual responsibility for subject matter, method, and quality; respect for fellow scientists contributions; informed consent; and the obeying of existing regulations. These guidelines also contain considerations regarding: the relationship between research and alternative knowledge; incorporation and respect of alternative knowledge sources; use of participatory methods; openness and conflicts of interests; maximum openness and transparency, but also respect for privacy; disclosure of possible conflicts of interests; and whistle-blowing. According to Mr. Kaiser, these ethical guidelines also contain a proposal for an Oath of Scientists (when the researcher attains a PhD level). The guidelines have been sent out for public hearing during 2006.

Mrs Simone Scholze, programme specialist of the UNESCO Division of Ethics of Science and Technology, initiated her presentation by clarifying that the meeting in Belo Horizonte is an important step in the process of regional consultations with relevant organizations and stakeholders in UNESCO Member States, in order to pursue reflections on how UNESCO and COMEST can contribute to the international debate on science ethics and scientists' responsibility (see attached the power point presentation). She also explained that following the debate and resolution of the last session of the General Conference, it would not be possible for UNESCO to engage in developing a normative instrument. The General Conference took note of the recommendation made by COMEST and requested the Director-General "to pursue reflection on the question of science ethics", in cooperation with ICSU and COMEST, submitting a report to the Executive Board at its 175th Session (September 2006). This formulation was the outcome of a lengthy debate concerning Resolution 39. The debate demonstrated that Member States did not support the development of a normative instrument in the area of science ethics, and that therefore a feasibility study would not be appropriate. For this reason the activities carried out by COMEST and by the Division of Ethics of Science and technology regarding this issue involve, among others, the following activities: survey the wider field of science ethics and topics that are specifically relevant from an international perspective; carry out consultations with

individual scientists, philosophers and policymakers in all regions in order to identify and discuss ethical issues that merit further reflection; and undertake similar consultations with relevant organizations and stakeholders in Member States. Mrs. Scholze informed that the general framework for the debate in this meeting is the place and the role of the UNESCO Recommendation of 1974 considered as the document of reference for these consultations. She also mentioned the work currently undertaken by the Division of Ethics of Science and Technology in this field: a collection of codes in various scientific and professional areas and in various countries and regions; a critical and comparative analysis of existing codes of conduct; and the creation of a specialised database of codes in the Global Ethics Observatory set up by UNESCO.

Session on codes of conduct for scientists in the perspective of Latin America

Moderator: **José Geraldo Freitas Drumond**

Mr. Enrique Rospigliosi, from San Marcos University, **Peru**, presented a legal approach of ethics and science. He noted that 500 years ago Inca culture made huge progress in a short time, but it was also rapidly destroyed. Inca physicians developed advanced knowledge about diseases that was even superior to European's at the time. Inca's progress in science and ethics was based in simple principles: "do not lie, do not steal and do not be lazy". Law and rules aim at peace and justice for human beings. Science must be in the service of men, cure diseases and help people. Law appropriate basic principles like human dignity. Bioethics principles are closely linked to law for they exist to satisfy human needs. He highlighted that new branches of science, such as genetics and proteomics, incite question about the role of ethics. Health professionals want to know which rules to apply when there is a conflict. The Universal Declaration on Human Rights and Bioethics must be implemented taking into account that mankind are not a mean to reach an end, but it is an end itself. He considers that in this area one should not legislate about everything, for positive law frequently illustrates only political will. He mentioned the importance of scientists responsibility, in a sense that their activities should be based in ethical principles, provided by education. He conclude that it is not law, but men, their wills and hopes, that need to be convinced in order to put science in their service.

Mrs. Alicia González Manjarrez, regional representative of Latin America Network of Biological Sciences, **México**, thanked those present on behalf of Professor José Maria Cantú, from Guadalajara University, and summarized the main recommendations, mainly the ethical aspects, of the World Science Conference of Budapest, organized in 1999 by UNESCO and ICSU. She highlighted the problem of the little support given to science compared to the high demands in terms of innovations. In Budapest, the forum about "Science use" took into account the role of science to make human future better, as well as its importance for peace, for reducing social inequality, keeping life and its diversity, fighting against environment damage, and keeping food and water safety. In the "Science for peace" forum, it was underlined that science should promote international social and intellectual solidarity. The thematic group on "Science for development" stressed that it would be important to channel science and technology investment into education and international and regional cooperation. The "Science for society" forum emphasized the role of research, which should benefit humankind, well being goals, respect of environment and human rights, in addition to equal access to science and to its benefits. The general conclusions of the Conference, that underline the principles to be elaborated by UNESCO and ICSU that should be adopted by future ethical codes of conduct, recall that: all communities must

benefit from science; science must be in service of human beings, warning against life and environment dangers; the goals of science must be clear; scientific work must be committed to society and a society without science is doomed to poverty.

Mr. Fernando Lolas Stepke, director of Pan American Health Organization (OPAS), **Chile**, started its address recalling that all Latin American encounter a great distance between theory and practice. He defined scientific and technologic research as a social process of invention, innovation (application) and transformation of society. It is also an intellectual product and procedure, with contents, texts and information linked to social interests. Science knowledge must be valid, public, general and able to be published. Research regulation is made by the scientific community, implicit or explicit rules, the legal system and public opinion (which should be the legal system base). He reminded Aristotle, “cautiousness is the most essential value”. Codes of conduct may be applied to process, procedures and products. They may be of different types: regional, local, etc. and be directed to different persons (researchers, groups, sponsors, etc); they may have ethics but also etiquette, that is, rules of proper behaviour, procedures that apply to the relationship between society and the scientific community. It is to be hoped that they be flexible and open, reflecting values and reaffirming principles. In order to interpret it, it is to be hoped that interpreters be accredited. On health research, he recalled that it is at once a public good and a value, that it has universal interest, emotional impacts, economic implications and context constraint. Finally, he underlined that there is a difference between “take care of”, “to heal” and “to cure”. He concludes affirming that a code of conduct for health research must be analytical, consistent, public, responsible, measurable, legal and resulting from specialists’ consensus.

Mr. Dirceu Greco, chief of the Department of Medical Clinic of Minas Gerais Federal University (UFMG), **Brazil**, thanked the invitation to participate and mentioned the elaboration of the Brazilian Code of Medical Ethics to which he participated some years before. He underlined that the 1948 UN Declaration of Human Rights emphasizes the right to education, employment and habitation, and that the Brazilian Constitution of 1988 also protects the right to health and life. He showed the unfair wealth distribution in Brazil and underlined its incoherence regarding other public investments. Using a world map, he pointed out an arch representing places where fatal diseases, for which treatments already exists, cause great mortality rates. Brazilian control of HIV/AIDS is however a great success, he pointed out, thanks not only to political will, but also to society participation. It is urgent nevertheless to assure sustainability for this policy and its dissemination worldwide. He highlighted that it is necessary to define new rules on pharmaceutical research, since research is usually concentrated, only on attractive drugs, forgetting some less interesting diseases, from the economic point of view. Regarding ethics, he recalled the UN Millennium Development Goals and the importance of people participation in the decisions about what deserves be investigated in terms of scientific research. He stated that it is time to “globalise” ethical principles and to bias ethical debate in order to guarantee access to research results for all Nations. He concluded affirming that the most important problem concerning human rights is implementing them rather than declaring new ones.

Mr. Carlos Roberto Collazo member of the scientific and executive committees of the Ibero-American Eco-bioethics Network for Education, Science and Technology, **Argentina**, started his address giving examples of extreme violent situations and natural catastrophes, drawing attention to the use of ethics and eco-ethics approach in these cases. He explained that his group aim at coordinating and networking specialists. He explained that disasters (an event of great impact and unpredictability that squander

resources, are beyond predictions and defy knowledge), and catastrophes (natural, accidental, economic, military - war or terrorism -, and institutional) require ten types of intervention, such as: preventive action when it is possible, know “*why*” it is necessary to ask help from mental health professional to the intervention; know “*what*” to treat, “*who*”, “*how*” and “*where*” (in the consulting room, or in the event place), etc. Among the activities developed by his group, he mentioned educative projects, congress organization, and elaboration of an on-line encyclopaedia. Ethics involves a reflection on human actions in situations where science and technology are inefficient before nature, and feelings of despair prevail.

Representative of the National Institute of Genomic Medicine, (INMEGEN), from **México, Mr Eduardo Rangel**, started his address stating that human genome anatomy shows that there are few differences between persons, but that genetic differences imply different answers to drugs. For example, in the future, we will be able to know in advance if some individuals risk contracting some diseases, thus medicine will be more preventive. However this has important ethical implications. INMEGEN was created to contribute to high quality genetic research and intends to study the genomic structure of Mexican population (in order to know the genetic variety of this population). This study has been carried out in 100 regions, on volunteers that must sign a formal consentment. INMEGEN also has a centre for ethical, legal and social studies that will support the elaboration of an ethical code of conduct for the Institute.

Session on Ethics from the point of view of Brazilian scientific community
Moderator: **Mário Neto Borges**, Scientific Director of FAPEMIG

Mrs. Leda Cristina Mendonça-Hagler, scientific director of the National Association for Biosecurity (ANBio), highlighted the importance of the subject nowadays. ANBio mission is to foster the progress and diffusion of biosecurity knowledge in Brazil. It's main focus is professionals training, having organized 13 courses for approximately 1400 students. They became an important group that reflects about technical security and ethics related to biotechnology and genetic engineering. ANBIO set up partnerships with governments, universities, research centres and cooperates with international institutions. A subproject on Science for Society, as well as the organization of the 1st Latin American Congress on Biosecurity, in 2005, was also underlined. She concluded saying that ANBio was a new communication channel between science and society in the Brazilian and Latin American context.

Mrs. Eliane Azevedo, representative of the National Council for Technological and Scientific Development (CNPq), started her address explaining science transformations that led to the elaboration of codes of conduct for human research. She mentioned research made in the USA, in the 60's, which had violated human integrity. The consequence was the creation of ethics committees in order to control such research as well as the Belmont Report. Afterwards, the same kind of initiative spread all over the world. In the 80's, there were strong concerns of public nature: how to ensure good quality of scientific research, avoid counterfeiting, frauds and false copies, etc. The scientific community started to debate on how to find and punish transgressors. Society still trusts on science, but this may change if adequate measures are not taken, warned Eliane Azevedo. She also underlined that either the elaboration of an ethical code of conduct by UNESCO or the identification and the recommendation of ethical principles, would certainly help those countries that do not have national codes to elaborate them. She mentioned that people resist codes adoption, but that they are undoubtedly

necessary. Universities do not provide educative programmes or trainings so as to ensure that future professionals be ethically responsible. On the other hand, society is now aware that the scientific community fears a trust breaking. She also underlined that it is necessary to draw attention to a sort of “new science”, especially in human health area, that promises miraculous cure without previous tests and evidences (i.e. stem cells). She suggested educative solutions as a first step towards the elaboration of ethical codes of conduct. She concluded quoting Albert Einstein who said, “people say that a great intellectual makes a great researcher, but it is integrity that does”.

The Regional Secretary of Brazilian Society for the Progress of Science (SBPC), **Mr. Robson Mendes Matos** started his address underlining that, among the scientific community, ethics is frequently seen as a restriction, in opposition to free and autonomous research. He said that the goal of science is human well-being, which it must contribute to preserve environment, human health and social equality. Scientific development can have dual use, may be benefit or not, and he gave, as an example, the use of pesticides or genetically modified organisms, that may increase crop culture but also cause environment impacts. Some risks may not be valued, and zero risk is utopia when talking about science. Despite these risks, benefits deriving from scientific development are also important. But some risks are neglected. Talidomia is a good example: the USA forbade its use in the country, but not the exports. Risks were known but this information was not disseminated. Ethics may include the democratisation of technological development. We may not forget that the control of some knowledge lead to the control of markets and the increase of companies’ performance, which are not merely altruists. He concluded recalling that our scientific and private life must also be guided by moral and ethical values.

The Member of COMEST, **MR. Luis Hidelbrando Pereira da Silva** started his address reaffirming the importance of the precautionary principle. In a globalised world, knowledge became a market issue, and there are big differences between developed and developing countries, which are not able to make original research and continue to export low added value products. Research in science and technology is based on innovation, which in turn is based on production, he observed. In the developed world, production generates not only consumer goods but also tools and equipments that can be used for further production and innovation. However, in developing countries, production is highly dependent on the imports of goods, machinery and equipment – and must be compensated for by the export of raw material and low value-added products. He illustrated this by measuring the cost of a piece of electronic equipment needed for scientific research in terms of the hundreds of hectares of soybean that Brazil would need to export to purchase it, as well as with the numbers related to cattle breeding and to the cost of forest depletion. It is the ethical role of scientists and technologists, funding agencies and scientific institutions to stimulate the development of new technologies more appropriate for the socio-economic development of the Third World. In concluding, he emphasized the need for good governance, ethical rules and other such ways to ensure that science benefits reaches the needy parts of the world. This is an imperative component of ethics of science, he said.

Jurist and coordinator of UNESCO chair on Human Rights in Brazil, **Mr. Dalmo Dalari** pointed out that there is a banalization, as well as an exaggeration, of the use of the word “ethics”, and mentioned the new professional, the “ethnicist”, as evidence of such situation. Ethics is a Greek concept, and it comes from “Ethos” which means a habit based on a value. Having worked in the area of human rights violations, he has noted that no culture allows attacks against human lives without punishment. Scientific

knowledge may be neutral; the problem lays on its use and acquisition. The use of human beings as guineapig is not considered as science progress. Scientific knowledge is relative, but some scientists refuse to accept that science has limits. He quoted the Universal Declaration on Human Rights, which considers human beings as the most important value. Research however has been influenced by economic considerations. He also mentioned other historical contradictions: slave owners defended freedom rights in the USA; some human rights were forgotten because of the communist threat. Contemporary questions related to ethics concern cloning, free export of drugs that are prohibited in some countries, transplant trade, use of drugs to change life rhythm. He stated that arrogance and curiosity might lead us to forget ethical questions. He concluded suggesting that States should adopt measures to extent benefits of scientific and technological development to the population, and to avoid that this knowledge be used in the detriment of human being.

Discussions

One participant made observations about publishing freedom for scientists and suggested that potentially dangerous paper should not be integrally published. This would prevent them from falling in bad hands. It was also underlined the risks linked to bioterrorism and the development of biologic weapons. Another participant drew attention to the funding sources for research, recalling that in some countries research is financed by the military sector, which brings serious problems in terms of ethics. Followed a brief debate on the availability of material for developing virus and biological weapons. Another participant recalled the question of military research in some countries, and suggested that UN carry out transparent study on the funding sources of research, and for what purpose. A participant highlighted that, in Brazil, since 1996, an independent committee is in charge of approval of research on human beings carried out in cooperation with foreign institutions.

Second Day

Working meeting with regional experts, representatives of National Commissions and UNESCO permanent delegations

Moderadoras: **Sra. Déa Fonseca, Sra. Simone Scholze e Sra. Lúcia Aleixo**

Concluding the first part of the meeting, with presentations by invited experts, the moderators invited the participants and representatives of National Commissions to present their viewpoints. Mrs. Scholze clarified that the main aim of the debate that day was to focus the UNESCO 1974 Recommendation on the Status of Scientific Researchers Recommendations for UNESCO and COMEST on the needs for codes of conduct for scientists.

Mrs Maria Celeste Emerick, from Oswaldo Cruz Foundation (FIOCRUZ), presented FIOCRUZ current debates and initiatives on ethics, human rights and intellectual property. She mentioned Projeto Ghente, that focuses on genetic material access, and Fiocruz Committee of Research and Ethics. She underlined the introduction of complex questions in research field and concluded that the strengthening of the intellectual property system depends on the definition of ethical and bioethical rules. There is controversy about whether knowledge developed by public institutions should be public or protected. Regarding the 1974 Recommendation, she recalled that it was written in a

different context than the present one. She expressed concerns regarding institutional responsibility or individual responsibility, underlining that scientific community strive for clear rules.

Mr. Francisco José Lima Aragão, from the Brazilian Enterprise of Agriculture and Breeding Research (EMBRAPA), talked about the professional view of ethics in science and its consequences for society. Scientific method acts over natural, not supernatural, phenomena. Humans are political beings, but, whereas science works with provisory conclusions, politics is concerned with conviction, and in this regard uncertainty is considered as inactivity. The idea that human beings are supreme beings has been changing in favour of nature preservation view. Scientists make research about things that are not known; therefore scientists cannot infer all research outcomes. In breeding research, for example, some simple findings may lead to unexpected results, beyond what was envisaged. He concluded that society need transparency about research projects, its impacts and opportunity. He also underlined the importance of improving knowledge transfers, including guidelines about ethics of science.

Many participants stated that 1974 Recommendation is a historic cornerstone because it recognizes scientist's role, and reaffirms their rights under authoritarian governments. They also believe that it comprise some scientist's duties, and provide elements and ideas to a future ethical code of conduct. Other participants recalled that there is still ideological and political pressure on science, especially on life sciences. Many participants drawn attention to the fact that 1974 Recommendation does not mention important issues, such as women's presence in science, and social sciences.

Mr. Joaquim Machado, director of biodiversity and biotechnology corporative diplomacy for Syngenta Company, thinks that ethics in the era of genetics is the same as "physics of information". For him, the word "status" on the head of the Recommendation of 1974 should be replaced by the word "spirit". He quoted Willian Gibson – "future is less recognizable because present is volatile" and underlined the necessity of technological risk management and of standards for its assessment. One factor that should not be neglected is the irreversible privatisation of research. Genetics is a search procedure that aims at optimising living beings, and that uses information technology (ITCs). Today, every science depends of computer science. For example, the identification of standards in nature leads to the replacement of taxonomy by information provided by molecular topography. Microorganisms are as vast as cosmic black matter, implying risks, risks perception and its use. A future UNESCO document should keep scientific method as a value itself. He concluded that an essential value, in sciences, is the scientist's "animus".

Mr. José Eduardo Siqueira, President of the Brazilian Society of Bioethics, talked about ethics professionals training. The classic model of ethical reflection is anthropocentric, cartesian, therefore compartmentalized. For present technological models, human complexity is irrelevant. The "one-dimensional man" is an example of academic vision. He mentioned the relations between science and technology, power and ecology of action; in other words, knowledge findings are immediately appropriated by technology and used by power. He compared the liberal model with the deliberating model, and found that while the first emphasizes individual action and what we "can do", the second emphasizes collective action and what we "have to do". In this sense, science and technology have succeeded and failed at once. He defined responsibility as "assuming consequences towards future generations". He concluded saying that it is

necessary to use knowledge with discernment; therefore, we must turn out citizens before turning out researches.

Mr. José Roberto Goldim, from Federal University of Rio Grande do Sul, expressed preoccupation with institutional policies on ethics of science. He said that, in all levels, ethical and moral aspects must be added to legal, technical and economic ones. Bioethics supposes the identification of references, facts, problematic cases, ethical conflicts and the search for consequences and alternatives. He mentioned some paradoxes when situations of uncertainty are concerned, such as the fact that there are rights ensured by the Human Rights Declaration that are not respected nor enforced even today. In general, “those who choose ethics do not need it”, he said. He proposed that UNESCO make a code, or an oath, or a set of ethical principles picked out from existing codes of conduct. He strongly approved the decision of making regional consultations and strengthened the need and opportunity of a Global Ethics Observatory (GEObs), suggesting that on-line consultations on codes of conduct could be made through GEObs database. He also deemed important that UNESCO improve its support for research groups and chairs and concluded stressing that ethics must be integrated to science, and not merely added to it from the outside.

Some participants recommended that any ethic survey take into consideration cultural specificities, particularly for Latin America and Caribe, but also try to promote a core of universal and perennial values. Others recalled that ethics of daily life should prevail over ethics of science, since the second is a consequence of the first one. Others suggested that UNESCO should not use the word «oath» (“juramento”) due to its religious connotation, being preferable to talk about “commitment rules”. It was also recalled that often the enforcement of a code rely on the existence of sanctions and of a structure that punishes transgressors. Many participants highlighted trade aspects of research and its consequences.

Mrs. Dafne Feinholz, Executive Director of the National Commission of Bioethics of México, suggested to clearly separating the elaboration, by UNESCO, of a general document on ethical principles, and the elaboration, by Member States, of codes of conduct. She also underlined that it would be important to include social sciences and informal knowledge in the debate.

Mr. José Israel Vargas recalled that science has its own dynamics and ethics, because its truths are provisory and refutable, while culture, differently, is more resistant to changes. He added that rationality, prudence and the recognition of truth as provisory are values that should be applied to science. It is necessary to separate the ethics of science from the ethics of society. He concluded that the 1974 Recommendation represent a progress when it admitted the difference between science practice on one hand and technological application on the other hand.

Mrs. Mônica Serra, from State University of São Paulo (UNESP), recalled that, due to possible political difficulties, it might not be advisable to UNESCO to try to elaborate a code of conduct for scientists nowadays. She nevertheless admitted the opportunity of identifying general ethical principles. She underlined the know-how of UNESCO, as a multilateral organism, in this field. Being a scientist does not mean being necessarily honest, she said. Scientists are human beings like others, with their virtues and imperfections. Scientists are proud, they need peer recognition and want to publish their work and findings. She also mentioned current rules for human-related research and the respective scientific community resistance vis à vis ethical analysis of projects. These

rules have already being asked by funding agencies, editors and scientific events. She highlighted the importance of education for ethics and of ethics teaching of future generations of researchers. She finally affirmed that the 1974 Recommendation is relevant, since it includes update information and should be preserved. Yet its implementation deserves some evaluation by UNESCO and its Member States.

The Secretary of UNESCO National Commission of Uruguay, **Mr. Fernando Lema**, made some observations about knowledge, ethics and globalisation. He thinks that after 500 years of knowledge accumulation, this is a moment of rupture for Latin America. Modernity has concentrated in a human/nature relationship where men dominated, whereas post-modern culture has a wider approach that do not undervalue nature. Science, as part of the culture of a specific group, must not be considered as neutral. European model of science, thanks to colonisation, inspires the Latin American one. For Mr. Lema, it is necessary to the continent to design its own model of science and technology and ethics. Local resources must be identified, known and protected so as to permit knowledge access and development. He concluded saying that the ethics of science is society's responsibility to build up its own ethics.

Mrs Telma de Souza Birchal, Professor of Philosophy at the Federal University of Minas Gerais (UFMG), analysed the 1974 Recommendation from an axiological point of view. Its preamble proclaims that scientific findings must be used for peace and well-being, but that there are risks of using this results. It also states two principles that should be respected: autonomy and responsibility. Deeper analysis of the document however shows that the main objective of the Recommendation is science development and autonomy. Thus this is a recommendation document for scientist and not a text that reflects deep discussion about ethics of science. In this sense, the document should be praised. But it remains vague on possible risks of scientific application and states that it is up to the scientists to evaluate the social and ecologic consequences of their activities. UNESCO task should be to deepen reflections on this second aspect, which the document vaguely mentioned. Scientific and philosophic circles have been searching today for new ethical paradigms that could play a regulatory role. She suggested a "core programme" which evokes different philosophic roots and could indicate some means so as to tackle new science and technology challenges: (1) to ask again, following Aristotle, what happiness is, evaluating its present meaning, taking into account notions of well-being, comfort and consuming, and, beyond prevailing individualism, insisting on collective notions of happiness; (2) reconsider the Kantian question of "What ought I do?" based in the total respect of human beings, and extend it to Hans Jonas ethics of responsibility idea, which takes into account long term periods as well as nature conservation; or (3) from Enlightenment, preserve its faith in the liberator role of truth and its respect for science knowledge, but now without illusions, so as to not give more – or less – value to science than it deserves.

Mr. Ivan Domingues, Professor of Philosophy at UFMG, highlighted the relations between ethics, science and technology and anthropology. He agrees with 1974 Recommendation, but he thinks that it needs further modifications. He identifies, in the document, three directives articulated as moral values and capable of bringing together the scientific community and to serve as a basis for the ethics of science: the defence of the ethics of well-being, the ethics of responsibility and the republican ethics (considering science and technology as public good). When using these three axes, it is possible, as suggested by the *Guiding Questions*, to think whether ethical and civic aspects of 1974 Recommendation are correctly described and still applicable. Taking into account moral aspects, techno-sciences situation and anthropology, he questioned

the average morality that guides people's life today and, by extension, scientists' behaviour. According to him, it is the hedonist ethics and utilitarianism that presently runs the world. In this sense, it is up to UNESCO to act in two directions: against nihilistic moral and against pragmatism, for the defense of a republican ethics, to which common scientists had preferred utilitarianism, while they make business of scientific activities. Regarding the techno-scientific question, Mr Domingues considers that 1974 Recommendation gives the same value to science and technology, and considers them as knowledge. After 30 years, the imbalance in favour of technology has grown, and draws more attention – after all, we do not achieve to control minds, but actions, he said. Regarding anthropology, to which 1974 document makes no reference, he believes that the reflection on ethics of science should emphasizes the scientists' human condition, in relation to the question of knowledge and to the moral issue: the human being in its double nature (wish/necessity and ingenuity/inventiveness). He suggested that UNESCO and COMEST update this debate by exploring the formulation of the anthropological question, in all its complexity but in a synthetic manner. He believes that there are not sufficient political conditions to UNESCO to propose a standard setting instrument, but that it would be necessary and desirable to actualise 1974 Recommendation.

Also Professor of Philosophy at UFMG, **Mr. Newton Bignotto** highlighted an important aspect of 1974 Recommendation: the relation between scientific practice and national interest. On one hand, this document states that science should contribute to the “individual development of Nations”; on the other hand, it takes into account “the great diversity of the laws, regulations and customs which, in different countries, determine the pattern and organization of research work”. He highlighted the existence of a potential focus of conflict between the international scientific community and the nations, as well as an incompatibility between global and local goals. In general, this document is still applicable and appropriate if we consider that the scientists' conditions in most countries did not change even today. Nevertheless, two aspects were critically underlined: on one hand, the document makes reference to the fact that the Universal Declaration of Human Rights protects the right of participating in cultural life and in the benefits of scientific development. It makes no provision for science practice, but only for the appropriation of its benefits by society. Thus, it is a turning point indeed, but not enough for regulating scientific activity. On the other hand, it provides for a restriction of innovation applications in two cases: the use for mass destruction weapons in war, or for the domination of a country. However, it evades some difficult questions when include them under the general terms of “complex ethical and moral problems”. This omission is of particular interest in the present debate regarding the new frontiers of science, especially in genetics. Considering that some ethical principles must not be avoided on behalf of other scientific principles, he considers that UNESCO should consolidate ethical principles that could serve as a starting point for future discussions about the relations between science and politics, and for establishing guidelines for scientific practice in general. The identification of these limits would help to build a framework for scientific research, not only for researches but also for humanity.

Following the discussion, some participants favourably recalled the presence of philosophers in ethical commissions and highlighted the risk of developing and using knowledge without a previous ethical reflection. According to some participants, scientific dogmatism has sometimes replaced religious dogmatism, what is an evidence for the necessity of including ethical reflection in young researchers' education. Others drew attention to ethical questions concerning patient/physician relationship. It was recalled that 1974 Document was approved by all UNESCO Member States and that, in

general, consensus also generate discontentment. Contrary to the bad use of its results, scientific activity has auto-corrective mechanisms. It was highlighted that it is still difficult to say whether scientific practice may have effects on social activities, thus it is dangerous to limit scientific practice autonomy. Other participants stated the intention of carrying out this kind of discussion within the ethical committees of research institutions. They also commented on the difficulties caused by the lack of regulatory mechanisms in the respective countries.

Mrs. Simone Scholze mentioned that in some occasions even UNESCO had almost forgot 1974 Recommendation, and putting it into focus again may already be considered progress. She also underlined that if in one hand the United Nations System encourage direct contact with society, on the other hand it can not be disregarded the fact that UNESCO is an intergovernmental organisation. She also highlighted that current regional consultations are not being carried out in a standard-setting context but in the framework of the mandate given by the General Conference, i. e. pursue reflection on science ethics. In order to summarise the debate, she presented some topics for participants, as follows:

- 1974 Recommendation is still relevant and pertinent.
- With mechanisms still to be identified, it is important to actualise some aspects of 1974 Recommendation, especially those related to scientists commitment to society and to society commitment to research results.
- It would be advisable that UNESCO proceeds with an evaluation on the effective implementation of 1974 Recommendation by Member States.
- UNESCO should pursue its efforts to carry out consultations and reflections on the subject.
- Priority should be given by UNESCO to the identification of general ethical principles to guide scientific activity.
- The elaboration of specific codes of conduct should rely on countries and scientific community.
- Two aspects of ethical reflection must be considered: intrinsic ethics of scientific practice on one hand, and ethical aspects of the relation between science and society on the other hand.
- It is crucial that scientists' education include education for ethics, with the goal of encouraging scientific integrity and other values.
- Presence of women in scientific research must be stimulated as an ethical component for the advancement of science and technology.
- Ethics of research with animals should also be considered in terms of codes of conduct for scientists.
- Social sciences should be considered in the reflection of the ethics of science and scientists responsibility.

Mr. Fernando Lema suggested that recommendations be addressed to the UNESCO National Commissions in this regard. He argued that 1974 Recommendation was out of the present contexts, and the presence of civil society should be prioritised. He also defended women's participation in scientific careers.

Mrs. Simone Scholze explained that it is not the aim of regional consultations to make recommendations to National Commission. On the contrary, UNESCO is coming to the countries in order to listening their considerations. Nevertheless, a consolidated report will be addressed to COMEST and subsequently submitted to the Executive Board of UNESCO, when it will be bring to the attention of all Member States.

Some participants suggested to add environment concerns to the debate. Others considered that scientist responsibility should take into account the gap between academic production and society needs. Another participant stressed that 1974 Document has an historical importance, but is not suitable anymore. This participant congratulated UNESCO for the initiative of consulting society, and thinks that its results might be published. He also argued that Government need clear guidelines on ethics of science and government's responsibility should be included in UNESCO future works in this field. One participant asked whether a new international instrument was really necessary or not.

Mrs. Simon Scholze recalled the *Guiding Questions for the Consultations regarding the 1974 Recommendation on the Status of Scientific Researchers*, hand out previously to the meeting, which asks:

- *Are the provisions in the Recommendation in general adequately covering the condition of science and scientific researchers nowadays?*
- *If no: Is it necessary to reconsider the text of the Recommendation? How far-reaching should this reconsideration be: updating the present text, revising the text, drafting a different text?*

She highlighted that UNESCO is in a listening mood vis à vis participants observations. They have to give opinion on which ways UNESCO should proceed. If a document is necessary or not, and which kind of document is up to the participants to say. For this reason the process is as important – or even more – as the final product, since this ultimately may be not come true. She reaffirmed the importance of a discussion including all those who are committed to the subject of ethics and science in different countries and regions of the world.

Mr. Matthias Kaiser recalled that, besides 1974 document, the Budapest Declaration of Science of 1999 is also very important, since it make specific recommendations on codes of ethics. It is necessary that UNESCO define what should be done, how and by whom. The 1974 document is deficient in reflections on the changes occurring in the last decades regarding institutional management systems of science and technology, on new forms of science making, on science in developing countries, as well as a tool for policy making. Ethics in engineering is also very important and was impressively highlighted during the debates in Asia. Many people think that it is necessary to coordinate the ethical debate about engineering activities and scientific research.

A participant suggested that UNESCO chairs should be stimulated to reflect on the subject and that new chairs should be created emphasizing ethics of science and education for ethics. Another participant expressed preoccupation with Latin America exclusion of the global scientific process. Another one stated that there are not sufficient mechanisms to operate and implement commitments taken by the States with the aim to keep freedom of research and ethics of science.

Mr. Paulo Martins, from the Institute of Technological Research of São Paulo (IPT), underlined that thinking about ethics and science demands thinking about the basis of scientific activity. Nowadays sciences is much linked to capital and markets, while ethical questions are complex and over all political. The control of ethicsof science is frequently a political decision. UNESCO should propose global recommendations, since science development causes global consequences. Ethically speaking, it is necessary to tackle these important challenges in order to go further, he said. **Mr. Fernando Lema** agreed with this opinion, saying that the knowledge “deficit” of Latin America has

ethical consequences. This situation was created by the historical mechanisms of colonization. We observe now the privatisation of knowledge that is supposed to be universal. Some Latin American countries are “brain exporters”, and this situation intensifies the gap between developed countries and the developing countries of this region. Some participants suggested that the report of the consultation meeting should recall their protest against the appropriation of knowledge by private sector and their concern regarding the commercial questions that affect science nowadays.

A participant thinks that 1974 Recommendation requires at least some complements that should be inspired by the UNESCO Bioethics Declarations, i.e., including subjects as human rights, anthropological questions, human creativity, gender questions, animals research, environment etc. Another attendant considers that international cooperation for research and multilateral agreements should be underlined so as to intensify concern with regional problems and not only with economic interests. Many participants recalled the importance of young researches education and training in the field of ethics of science.

Mrs Simone Scholze informed about current activities at UNESCO in the area of ethics education, including the development of a core curriculum and teachers training in ethics of science and bioethics. She invited attendants to consult and join the Global Ethics Observatory (GEObs). She requested them to send examples of regional ethical codes to be analysed and included in UNESCO database.

Mrs. Déa Fonseca thanked all for coming and closed the meeting.