

The Need and Desirability of an (Hippocratic) Oath or Pledge for Scientists

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Background

The 1999 World Conference on Science, jointly organized by UNESCO and the International Council for Science (ICSU) in Budapest (Hungary), devoted special attention to the issue of ethical principles and responsibilities in the practice of science. At the opening session, Joseph Rotblat in his keynote address plainly stated:

I hope that this World Conference on Science will finally convince the scientific community that modern science must take human values into account. By adopting the Declaration on Science and the document Science Agenda - Framework for Action, the participants in this Conference commit themselves to taking responsibility for the ethical issues arising from the pursuit of science (...).

These desiderata should be expressed in an ethical code of conduct for scientists, and formulated in some sort of a Hippocratic Oath. An ethical code of conduct for medical practitioners has been in existence for nearly two and a half millennia. In those days - and still today - the life of a patient was literally in the hands of the doctor and it was essential to ensure that the doctor would wield his power responsibly, with the care of the patient being his foremost duty. Hence, the Hippocratic Oath taken by doctors when they qualify.

Nowadays, scientists can be said to have acquired a somewhat similar role in relation to humanity. The time has thus come for some kind of oath, or pledge, to be taken by scientists when receiving a degree in science. At the least, it would have an important symbolic value, but it might also generate awareness and stimulate thinking on the wider issues among young scientists.

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These words found clear echo during the International Forum of Young Scientists, also held during the Conference. In the final recommendations 150 young scientists openly declared to "strongly support the establishment of a scientific Hippocratic oath".

These voices, and others, were carefully taken into account in the conference document 'Science Agenda - A Framework for Action' which, without explicitly mentioning the oath, emphasizes the need for ethics in science education and practice. Under Para 3.2 point 71 the document states: "The ethics and responsibility of science should be an integral part of the education and training of all scientists. It is important to instill in students a positive attitude towards reflection, alertness and awareness of the ethical dilemmas they may encounter in their professional life. Young scientists should be appropriately encouraged to respect and adhere to the basic ethical principles and responsibilities of science. UNESCO's World Commission on the Ethics of Scientific Knowledge and Technology (COMEST), in cooperation with ICSU's Standing Committee on Responsibility and Ethics of Sciences (SCRES), have a special responsibility to follow up on this issue." (UNESCO, 1999).¹

This paragraph was fully endorsed by the 30th UNESCO General Conference in 1999, which also decided that "promoting debate, research on ethical issues related to the practice of science and to the application of science and technology (...) will be pursued in close cooperation with UNESCO's World Commission on the Ethics of Scientific Knowledge and Technology (COMEST) and ICSU's Standing Committee on Responsibility and Ethics of Science (SCRES). The ethics and responsibility of science will become an integral part of science education and the training of scientists promoted by UNESCO."

As a follow-up to the 1999 World Conference on Science, the Committee on Scientific Freedom and Responsibility of the American Association for the Advancement of Science (AAAS) held two meetings, in September 1999 and February 2001, with the primary purpose to generate broader awareness on the issues associated with an oath for scientists and to the possibility of adapting the Hippocratic oath to encompass all scientific disciplines. Noting that the general public is increasingly aware of the power of science to both create and destroy life,

¹ UNESCO (1999). *Declaration on Science and the Use of Scientific Knowledge. Science Agenda - Framework for Action*. World Conference on Science, Budapest.

the Committee has been considering whether an oath for scientists, together with a vigorous debate on these issues, is desirable or even necessary.

In the meantime ICSU issued in 2001 its 'Standards for Ethics and Responsibility in Science - an Empirical Study'. This document, analysing a number of existing standards for ethics and responsibility in science, is SCRES contribution to the task given by the WCS Delegates and UNESCO Member States. The study is also supplemented by an extensive background document: 'Standards for Ethics and responsibility in Science: An analysis and evaluation of their content, background and function'. These documents, intended as starting point for further discussions in the scientific community, aim at laying proper ground for substantial inquiries and normative discussions, with a view to undertake appropriate action in the field (ICSU, 2002).²

As these studies make clear, ethical standards for science must be formulated with great care and integrity. Asking scientists to be socially responsible, for instance, requires the study of ethics to be of an integral part of their education and training, with the purpose of enhancing future scientists' ethical competence. This is essential in determining where the main ethical differences versus similarities lie, thus addressing possible conflicts.

ICSU research, which takes into account 115 ethical standards for science (39 international and 76 national), shows an exponential increase of the number of standards over the years, from mere 6 existing before the 1970s to more than 40 being issued during the last five years of the second millennium.

Renewed interest

On 11 September 2001, the terrorist attack against the United States of America caused the international community to focus on the issue of terrorism with renewed intensity, thus adding a specific anti-terrorist concern to the science ethics agenda, as it was the case at the end of World War II for the use of nuclear weapons and its dreadful conse-

² ICSU (2002). *Standards for ethics and responsibility in science - An empirical study*. International Council for Science, Paris.

quences. Especially the anthrax letters reactivated the concerns about possible dual use of scientific knowledge and technologies.

As a first response, in October 2001, the UN Secretary-General established a Policy Working Group on the United Nations and Terrorism. Its purpose has been to identify the longer-term implications and broad policy dimensions of terrorism for the United Nations, and to formulate recommendations regarding the steps that the United Nations system might take to address the issue. In doing so, the Policy Working Group was specifically requested to consider terrorist acts as a threat not simply to human security, but to the very principles and values of the United Nations Charter, thus calling for a coherent and coordinated response by the organizations of the UN system as a whole.

In 2002, the Working Group transmitted its Report to the UN Secretary-General, including 31 Recommendations. Recommendation 21 is of particular relevance to the issue of science ethics:

Relevant United Nations offices should be tasked with producing proposals to reinforce ethical norms, and the creation of codes of conduct for scientists, through international and national scientific societies and institutions that teach sciences or engineering skills related to weapons technologies, should be encouraged. Such codes of conduct would aim to prevent the involvement of defence scientists or technical experts in terrorist activities and restrict public access to knowledge and expertise on the development, production, stockpiling and use of weapons of mass destruction or related technologies.

The UN General Assembly and the UN Security Council endorsed the Report and its Recommendations, transmitting it to all the Organizations and Specialized Agencies of the United Nations System.

At the invitation of the Director-General of UNESCO, a UN Inter-Agency Consultative Meeting was held at UNESCO HQs in Paris, on 26 February 2003, specifically to discuss Recommendations 10 (focused on education, tolerance and respect of human dignity) and 21 of the Report.

One of the outcomes of this UN Inter-Agency meeting was a general recommendation towards "encouraging ethical codes of conduct for scientists and engineers" and "promoting ethics of science education and awareness". The ethical task given by the World Conference on

Science to COMEST and ICSU was recalled and reinforced. One of the final recommendations of this meeting is that "existing relevant bodies such as COMEST could in particular play a decisive role in fostering a continued dialogue on education and ethics of science", also recommending the "specific involvement of the COMEST together with ICSU" in the field of the "responsibility of scientists" (UNESCO, 2003).³

COMEST explorations

To explore the wider field of science ethics and relevant topics for future international action, UNESCO and COMEST set up in 2005 an ad hoc group of prominent scientists, philosophers and experts to examine this matter. In its 4th Session in Bangkok in March 2005, COMEST endorsed the strategy for preparing a feasibility study, on the basis of a recommendation from a group of experts. A two-tier approach was chosen: developing codes of conduct is the work of scientific organizations and academies, but UNESCO could develop a framework of ethical principles on which codes of conduct could be grounded. COMEST therefore advised UNESCO to carry out studies on the advisability of drafting an international declaration on science ethics that could serve as a basis for an ethical code of conducts for scientists. This recommendation was transmitted to UNESCO's Executive Board in its 172nd Session in September 2005, and to the General Conference of UNESCO in its 33rd session in October 2005.

Pursuant to Resolutions 35 and 39, issued after intense debates among Member States, the General Conference took note of COMEST recommendation and asked the Director-General "to pursue reflection on the question of science ethics", in cooperation with ICSU and COMEST, and to submit a report to the Executive Board at its 175th Session in September 2006. This action was the outcome of a lengthy debate, which showed that, after the three UNESCO declarations in bioethics - on the human genome and human rights, on human genetic data

³ UNESCO (2003). *Promoting peace and security through education and science: Elements for a United Nations strategy against terrorism*. Report on a United Nations Inter-Agency consultative meeting, Paris 26 February 2003.

and on bioethics and human rights - not all Member States are convinced of the necessity to develop a new normative instrument in the area of science ethics, and that even starting a feasibility study would be premature.

After the debate and resolution of the General Conference, it is not possible at this time to develop a normative instrument. This is owing to a lack of consensus among the Member States on when to start such an international normative process, and also to UNESCO's decision to concentrate on implementing existing normative instruments and on ratifying those adopted to ensure their widest possible application.

Consultations and analysis

In order to pursue reflection on the question of science ethics, UNESCO is currently carrying out three types of activities:

1. Surveying the wider field of science ethics and particularly topics that are relevant from an international perspective by carrying out consultations with individual scientists, philosophers, policy-makers, and relevant international and regional organizations and stakeholders in all regions, in order to identify and discuss ethical issues that merit further reflection;
2. Making an analysis of existing codes of conduct in various scientific and professional areas, and in different countries and regions; and
3. Reviewing previous work of UNESCO in this area, especially regarding the Recommendation on the Status of Scientific Researchers, adopted at the 18th session of the General Conference, in November 1974.

Regional and international consultation meetings with scientists, ethicists and policy makers are organized during 2006 and 2007. They are an opportunity to gather facts and exchange information on all the issues surrounding codes of conduct for scientists as they pertain to UNESCO's mandate. To generate information from the consultation meetings, a guiding document with questions and items about the 1974 Recommendation on the Status of Scientific Researchers has been produced as starting point for discussions (UNESCO, 1974).⁴ The questions are helping to verify whether the provisions in the 1974 recom-

⁴ UNESCO (1974). *Recommendation on the status of scientific researchers*.

mentation adequately cover the condition of science and scientific researchers today, or, if not, which general issues should be reconsidered. The questions will also help to determine which ethical principles should be taken into account, and if there are any aspects that are missing or not addressed. In 2006 consultation meetings have taken place in Tokyo, New Delhi, Bangkok, Geneva, Belo Horizonte and Dakar. Detailed reports of the meetings are available on the UNESCO webpage⁵.

Most of the experts in the consultation meetings made strong arguments in favour of codes of conduct for scientists, and education and training programs to help address ethical concerns. Participants agreed that efforts to elaborate ethical rules regarding scientific and technological activities needed to be harmonized internationally, given the global scope of the scientific community. Agreement was also expressed with the idea that codes of conduct can help inform individual scientists about their ethical and legal responsibilities when conducting research, thus can promote a culture of responsibility and raise awareness among scientists and students about ethical issues. It was also argued that governments and scientists need to work together to develop and apply rules for good conduct. Such rules must result from a process that provides reassurance to the public that precautions are being taken and that risks are being considered and addressed appropriately. Efforts to achieve a harmonized international approach to science ethics and scientists' responsibility would have to overcome diverging perspectives. International organizations can help to bridge these differences by providing an international discussion forum. In order for UNESCO to fulfil this role, however, a strong and broad political commitment is required at both the national and international levels.

In order to have a better view of the current situation, UNESCO has started a study on existing codes of conduct and codes of ethics for scientists and associated professions, in various scientific and professional areas and in various countries and regions worldwide. The study has three components: building a collection of codes (in different professions, countries and organizations); undertaking a critical, comparative analysis of codes and identifying their strengths and weaknesses; and creating a specialized database of codes in the Global Ethics Observatory (GEObs). This study is an on-going process. Increasing the collection of codes in different regions of the world in order to cover as many different disciplines as possible would in future give a more accurate

⁵ <http://www.unesco.org/shs/ethics>

picture of the distribution. The geographical focus of the study thus far has been on Asia and the Pacific, and Europe and North America, two of the four UNESCO regions where consultations with scientists, ethicists and policy-makers already have taken place. A total of 65 codes have been analysed, minority of which (17 %) have global coverage. Two codes have regional coverage (Europe), while the majority of the codes have national coverage. Details concerning these codes will be available in the new UNESCO Database on Codes of Conduct which will be launched in Spring 2007.

The overwhelming majority of the codes analysed thus far are provided by organizations (47 national, 2 regional and 8 global codes) with voluntary membership for professionals in a certain discipline. A few codes are issued by companies, non-organizational groups of scientists, universities and governmental advisory commissions. In most cases (80 %), a code addresses all members of an organization, regardless of their membership status. Sometimes certified members must abide by a more extensive code than other members, and sometimes sanctions only apply to certified members.

The codes analysed address many different professions and disciplines, and have been classified according to ISCO-88. The most represented group is Physical, mathematical and engineering science professionals (46 %). The second largest number of codes is found within the disciplines of Life science & health (29 %). Codes from social and human sciences were found to a much lesser extent. This distribution of the analysed codes among different disciplines indicates that there might be a higher concern for ethical issues within the disciplines of technology, engineering and computing sciences and within life science and health than within the social and human sciences.

The content of the codes have been analysed by identifying statements that explicitly refer to an ethical principle or value. The references can be to (1) external ethical principles or values: relate to social context and responsibility towards society, and (2) internal ethical principles or values: refer to scientists' individual professional behaviour related to ethical issues. This two-level approach is based on proposals made in an expert meeting on an Ethical Code of Conduct for Scientists in UNESCO Headquarters in March 2005.

The most frequently mentioned internal statement is Confidentiality of information, followed by a number of statements which are more equally occurring. These are Maintain/upgrade professional compe-

tence, Avoid and report conflicts of interest, Honesty, Cooperation with co-workers and Integrity.

The most frequently mentioned external statement is Environmental responsibility, closely followed by Public welfare and safety, and further by Respect for human dignity and Social responsibility. The statement Social responsibility includes statements such as responsibility to future generations, responsible design and implementation of products within IT or engineering, and the avoidance of harmful effects to health and welfare.

This study is an on-going process. Currently efforts are made to increase the collection of codes in order to cover as many different disciplines and as many regions as possible, thus giving a more accurate picture of the distribution. In the perspective of pursuing reflection on a possible 'ethical framework' in the context of UNESCO, it is fundamental to focus on the ethical values shared by a majority within the scientific community.

On 20 November 1974, at its 18th session, the General Conference adopted the Recommendation on the Status of Scientific Researchers. This Recommendation, although from 1974 but part of the UNESCO normative framework, was used as an important background document during the consultation meetings. The participants of the various consultation meetings were invited to reflect on a list of guiding questions on the relevance of the Recommendation, previously prepared by the Secretariat. This set of questions mainly referred to the scope of its coverage as regards the advancement of science today, and to the application of its principles and norms regarding contemporary advancements in science and technology as well as regarding the mechanisms created to ensure this application.

Preliminary conclusions indicate that, taken as a whole, the Recommendation is a relevant and coherent text even nowadays. Most participants agreed with the Recommendation as an important starting point for the debates. Several options were raised and examined: updating the document; making it better known and more effective in practice; or use it as a basis for new document, explicitly referring to ethical principles. It was a general opinion of the participants that, through its approach of looking at public and ethical aspects of scientific activities, this instrument was significant in combining the idea that individuals involved in scientific activities have a personal responsibility and that this responsibility implies certain commitments regarding society. In

the consultation meetings, consensus was reached as regards the importance of promoting the Recommendation and evaluating its impact in Member States over time. Many participants also recalled the outcomes of the World Conference on Science in Budapest in 1999, when the debates on the elaboration of an oath or pledge for scientists resulted in the adoption of the Declaration on Science and the Use of Scientific Knowledge and the document Science Agenda - Framework for Action. The need for implementing the ethical aspects of this Declaration was also invoked by the participants as a basis for the work of COMEST, mainly regarding the education and training of scientists and codes of conduct for scientists.

The way forward

In its Extraordinary Session in June 2006, COMEST reviewed the results of the activities undertaken (viz. the consultations, the interim analysis and the relation with the 1974 Recommendation). The Commission recommended to the Director-General of UNESCO (1) that Member States should be reminded of the principles adopted by them in the 1974 Recommendation on the Status of Scientific Researchers; this instrument, together with the Declaration on Science and the Use of Scientific Knowledge, should be taken as a general reference for future works; (2) the work that has been undertaken by UNESCO so far, such as the collection of codes of conduct worldwide, the critical and comparative analysis of existing codes, as well the elaboration of educational tools should be supported and encouraged; (3) further international reflections and consultations should be carried out and fostered in order to identify a general ethical framework to guide scientific activity that will cover other stakeholders beyond the focus on scientists; (4) UNESCO, with the advice of COMEST, should work out such a general ethical framework; (5) the subsequent elaboration and/or implementation of specific codes of conduct for scientists should rely on Member States and the scientific community; (6) in this regard, it is necessary to set up a wide participatory process, involving all stakeholders as well as the society at large with a view to initiate actions in relevant sectors in the society.

Essentially, these recommendations reflected the same point of view as previously promoted by COMEST: it is up to the scientific community

to develop codes of conduct, UNESCO will not make a code of conduct for scientists but can develop the general ethical framework that can guide the development of codes. There is no suggestion at all that such general framework should be a normative statement or declaration. The decision of the 175th session of the Executive Board was to invite the Director-General "to analyse the ethical principles of the Recommendation on the Status of Scientific Researchers as well as of the ethical aspects of the Declaration on Science and the Use of Scientific Knowledge, in order to encourage their use by Member States".

Wider context

From a long-term perspective, exploring the issue of codes of conduct is an example of explorative research in the wider area of science ethics. In this domain of ethics, the interrelationship between science, society and values is the focus of philosophical research. Various philosophies of science have an impact on the conceptualisation of this interrelationship. It might be, for example, interesting to explore how is the relevancy today of the universalism that has been determinative for the development of academic science (following the works of Bernal and Merton, emphasizing the scientific community as a universal one, with science as a profession committed to basic values). Today, however, trust in science has diminished and the demarcations between science and other activities have been obliterated. Science nowadays is also conceptualised as a commercial enterprise, or at least closely connected to entrepreneurial and business activities. A more radical view conceptualises science as an activity of rivalry and competition (according to the ideas of Latour: science as war).

Given the uncertainty about the basic values involved in science, we are confronted with a paradox: there is a growing need to develop codes of conduct but at the same time there is a lack of clarity about what such codes will imply. Developing codes will therefore not merely be a matter of identifying which values are intrinsic in science. It will also be a matter of negotiation aimed at creating new perspectives of trust in relation to society. The basic values of science at least need to be connected with the notion of social responsibility and accountability. This development is reflective of the changes that have occurred in the recent history of bio-ethics: codes of conduct in health

care not only have to articulate the basic values of the professionals but also to introduce the perspective of patients. This has been the major change from the Hippocratic ethics into the bioethics of today.