The Address of UNESCO

by Koïchiro Matsuura

Director General
The United Nations Educational, Scientific and Cultural Organization

Delivered on his behalf at the Closing Session of the Symposium BioEd 2000: The Challenge of the Next Century.

Monsieur le Président de BioEd 2000,
Monsieur le Président et Monsieur le Directeur exécutif de l'Union internationale des sciences biologiques,
Monsieur le Directeur du Muséum national d'histoire naturelle, Mesdames et Messieurs les participants,
Mesdames et Messieurs,

Je voudrais en tout premier lieu féliciter l'Union internationale des sciences biologiques d'avoir si bien préparé ce colloque international et proposé un programme remarquablement complet. L'UISB, partenaire de longue date de l'UNESCO, a réussi à réunir des experts de haut niveau représentant un large éventail de domaines connexes pour conduire le débat sur des questions dont l'importance est capitale pour le monde du 21ème siècle. L'UNESCO a eu l'honneur de parrainer BioEd 2000.

Les débats se sont déroulés dans un cadre exceptionnel, celui de la Grande galerie de l'évolution du Muséum national d'histoire naturelle que je remercie d'avoir accueilli cette manifestation.

I can assure you that UNESCO, in full partnership with the IUBS, will be active in following up recommendations made at this meeting for the improvement of biology education in its Member States.

As you undoubtedly know, at the World Education Forum in Dakar last month the international community renewed its commitment to basic education for all. Governments, intergovernmental organisations, NGOs and all other stakeholders reaffirmed the high priority that must be given to the provision of quality learning to all the world's children.

UNESCO is fully aware of its great responsibilities in playing an effective role in translating this commitment into a concrete reality. We are already preparing to give a new impulsion to our work in the field of education... And this effort to build up a world-wide momentum will be the business not only of UNESCO's Education Sector and Education Institutes, but of all its Sectors, not least of which will be the Science Sector.
For, in my view, basic education in the emerging knowledge society of the 2lst century must be seen as part of a continuum that includes secondary, technical and higher education.

Why is this so important?

We live in a world where information has become the primary resource. There is a general consensus today that education is the key to development. But we are only beginning to realise just how essential it is for each and every country to have its own science and technology base. And the first step to building up this base is in the provision of science and technology education programmes.

Without this, countries cannot be active participants in the knowledge society. Without a basic science and technology education, people cannot participate fully in our fast-moving, interconnected and globalized world. We see every day the power of shared knowledge. But to share knowledge means sharing as active partners, not as passive recipients.

This is why science education was an important topic at the World Conference on Science in Budapest last June, organised jointly by UNESCO and ICSU, the International Council of Science, of which the IUBS is an active member.

The Declaration on Science and the Use of Scientific Knowledge, adopted in Budapest declared:

> "*... access to scientific knowledge is part of the right to education and the right to information belonging to all people; ... science education is essential for human development and for creating endogenous scientific capacity, ...*"

As part of its follow-up to that Conference, UNESCO's Education and Natural Science Sectors are working together to prepare an integrated International Plan of Action for Science and Technology Education. Its main thrust will be to renew, diversify and expand science and technology education at all levels of learning, both in-school and out-of-school.

The promotion of biology teaching through science and technology education for girls and women and the development of gender sensitive approaches will be given a high priority.

Ladies and Gentlemen,

Biology is at the core of new "contract" between science and society to which the Budapest Conference sought to pave the way.

To summarise, the new contract involves renewed public support for science education and research on the one hand, and, on the other hand, the commitment of the scientific community to place science at the service of sustainable development and pressing human needs in such fields as health and nutrition.

Applications of biology today impact - or have the potential to impact - in the most far-reaching ways on our lives and environment. It is clear that the notion of a social contract for science, particularly its ethical dimension, has important implications for the framework within which biology is taught. And of course, the actual scientific developments which have given applied biology new life-changing powers have important implications for updating the biology curriculum.

So there is a major challenge for renewing the teaching of biology itself and another great challenge for teaching the issues linked to biology.

I said in my opening remarks that the biology-related issues you have been discussing are of pivotal importance to the modern world. It appears to me from the themes of this symposium's sessions over the past four days that you have been establishing a new social contract for science education!

You have balanced admirably the scientific aspects, and the social and ethical aspects of biology teaching. It makes me optimistic for the future of this highly influential discipline, which has extraordinary potential not only for producing scientists but also for producing generations of responsible citizens who match scientific, social and ethical awareness.

This is essential, as so many issues of major importance today - concerning human health, reproduction, food safety, intellectual property rights and so forth - require not only good analytical skills but a sound grounding in the science itself. In short: the level of biology literacy needed to be able to participate fully in many areas of public debate has risen dramatically in recent years.

As you know, UNESCO is actively engaged in encouraging broad debate on bioethical issues. The extensive world-wide discussions led by UNESCO's International Bioethics Committee, prior to the adoption by the United Nations of the Universal Declaration on the Human Genome and Human Rights, offer a model of participatory debate leading to collective decision-making.

UNESCO has also been at the forefront of international efforts to ensure that the DNA sequence data generated by human genome research remains within the public domain.

It is essential that such undertakings have strong public support, and that can only come from a clear understanding of the issues at stake. Here, biology education has a major role to play. Over half a century ago, UNESCO's founders called in its Constitution for - I quote - " ... *the education of humanity for justice and liberty and peace..*" They wrote that at a time when molecular biology and biotechnology were as yet unknown, when issues such as biodiversity and bioethics had not emerged.

The Western world was shaking off the legacy of eugenics, but as yet knew nothing of the new pitfalls of genetic determinism or the commodification of nature. However, that insistence that education must be far more than technical instruction remains as valid as ever. And the framework given by UNESCO's founders, when they insisted on the intellectual and moral solidarity of humankind, remains as valid as ever.

You have been very true to that framework in your efforts to establish ways of improving not only the contents of, but also access to, biology education. The biology teaching of the new century must aim at much more than scientific and technical competence. It must, at its basic level, offer everyone the opportunity of a learning experience that contributes to personal autonomy and responsible citizenship.

And for up-to-date, relevant biology education to be available to all, it must be given a new momentum - not only nationally but internationally. Renovated educational programmes, teacher-training, educational materials and delivery systems all need special attention.

Let me take the example of biodiversity education. A far greater effort in education in biological diversity is needed to create world-wide public awareness of the issues at stake.

Only an educated, global constituency for biodiversity can build up the pressure to ensure that we take the path to a sustainable future. A new global initiative is being developed by UNESCO with other partners. The mandate for this initiative is provided by a decision of the last Conference of the Parties to the Convention on Biological Diversity, the CBD. It invited UNESCO *"to consider launching a global initiative of biological diversity education, training and public awareness."* This UNESCO/CBD global initiative will not become a totally new programme of action. Rather, it proposes to link and support on-going processes and to develop a new dynamic in this way.

Developing this global initiative requires a committed team effort. In addition to the strong partnership between UNESCO and the CBD Secretariat, close cooperation will be needed with institutions of the UN family and non-governmental organisations as well as with teachers and schools world-wide.

UNESCO has convened a first meeting of key partner agencies at its headquarters here in Paris in July to set the initiative in motion. That gathering will pay particular attention to the results of this Symposium and will welcome any concrete suggestions you wish to make on action to be undertaken.

Ladies and Gentlemen,

BioEd 2000 has discussed new knowledge, new issues, new tools and new partners. It has examined the whole panorama of the biology revolution in order to better understand and define our approach to biology education. UNESCO is looking forward to strengthening cooperation with the IUBS in:

- keeping this forum open and alive, and developing and expanding biology education,
- producing guidelines for the development of education in such domains as biodiversity, biotechnology, natural resources conservation and management and bioethics;
- assisting Member States in the development of curricula, teacher training programmes, educational materials and
- working in close collaboration and partnership with the science education community, notably in the domain of biology education.

In conclusion, I would like to say something about the timing of this Symposium.
I believe the time is ripe for biology education to take centre stage.
It responds to the curiosity of children and young people about so many aspects of life and the world about them.

It offers them essential tools for tackling the issues which so may young people take to heart, such as protection of the environment and conservation of plant and animal life.

Public concern about issues like genetic engineering and the ethics of biomedical techniques suggests that there will be increasing demand for life-long access to biology education.

I am convinced that biology education in the 21st century will be central to efforts to reach social consensus on the use of many new technologies and on the management of natural

resources. You have showed that you are prepared to respond to this challenge, and I congratulate you.