

REPORT OF THE ICSU LIAISON COMMITTEE (2000-2003)

Chairman: J.P. Morucci

Foreword

ICSU, the International Council for Science www.icsu.org is a non-governmental organisation that was founded in 1932 and whose mission is to "strengthen international science for the benefit of society". The ICSU membership is made up of 101 national science academies/research councils and 27 international science unions. Since September 1999, IUPESM is the 26th Union Scientific member.

As within the very large international bodies, it is difficult to play an efficient role and to develop an explicit strategy to strengthen and expand our relations within and among its major members groups. To understand the structures, strategies and programmes of ICSU takes time and this explains this long report with many annexes in order to:

- 1) permit the future Liaison Committee to be informed of the IUPESM activity between 2000 and 2003
- 2) raise up vocations, invite volunteers to join this new Committee and become "advocates" of our disciplines among the International Scientific Community.

2000, September 14

Visit at the headquarters of ICSU in Paris and discussions with the ICSU officers to identify existing programmes with which IUPESM can become involved and contribute. J.P. Morucci.

2001, February 18-20

Three members of the ICSU Liaison Committee (Keith Boddy, Dov Jaron and Jean-Pierre Morucci) have attended the Meeting of ICSU's International Scientific Unions in Paris. The meeting, midway between General Assemblies, was the first of its kind and seemed essential to improve communication among the Unions themselves, as well as with ICSU's Executive and Secretariat.

During discussions, several of our proposals were not only well-received but also generated common interest and support, some becoming 'adopted'. These included: 'Public Understanding of Science' which is being pursued most actively; 'Health and Well-being', which may become an ICSU theme; 'Balanced (Expert) Statements' under the aegis of ICSU on topics of international concern; on-line educational material recognised by the offer of inclusion on the ICSU web-site. There was also substantial interest in the example of a 'co-laboratory', described by Dov Jaron.

2001, March, ICSU Grant Programme 2002

As a consequence of the contacts during the Paris meeting, two collaborative Grants Programmes were submitted for consideration by ICSU. These were:

- 1) Developing the Physiome Project: Modelling the Lung

This project is in collaboration with IUPS -International Union of Physiological Sciences. Fumihiko Kajiya is directly involved

- 2) Bridging the Digital Divide

This project is in collaboration with URSI (International Union of the Radio Science) and reflects the practical experience within IUPESM in implementing telemetry for medical purposes, especially in relation to Developing Countries.

- 3) Contact with the Academy of Sciences from Armenia on a project entitled "*Organisation and Development on the Telemedicine in Armenia*" which could be envisaged in the ICSU 2003 Grant Programme.

- 4) Each of the Member Unions has been awarded with a \$5,000 grant to be used in any of the five areas allowed in the Grants Programme 2002 (i.e. Science and Technology for Sustainable Development, Capacity Building and Science Education, Science/Policy Interface, Dissemination of Information on Science and Technology, and Emerging Science and Technology -- Creation of New Knowledge)

This grant has been used to pursue an action, proposed previously by Keith Boddy, on improving Public Understanding of Science, including political decision makers and opinion formers especially (but not only) in Developing Countries. The envisaged project was to realise a brochure entitled "Contributions of Physics and Engineering in Health Care", written in terms readily understandable by the lay person and to make it available on the IUPESM web site and also that of ICSU as well as a hard copy brochure.

2001, March IUPESM 2000 report for inclusion in the ICSU 2000 Annual report.

2001, April

Report written by Slavik Tabakov at the request of ICSU concerning capacity building activities of IUPESM. (Annex 1_2 pages)

2001, July 23

ICSU has determined that it should play an increased role in scientific debate on matters that pertain to the world scientific community, and indeed the population at large. Towards that end, the Executive Board of the International Council of Science (ICSU) at its recent meeting in Cape Town has expressed a desire to make considered comment on a wide variety of significant scientific issues that affect both its Union and National Members. Twenty such topics have been listed for immediate consideration. Cari Borrás and Keith Boddy have agreed to act as the IUPESM's representatives on Topic 14 Nuclear Energy.

2001, October 20

IUPESM text for the 2002 Year Book and additional information for the Calendar of Meetings.

2001, September,

ICSU was officially invited by the United Nations to serve as the "Organising Partner" for the International Scientific and Technological Community (IS&TC) for the extensive preparatory process underway for the World Summit on Sustainable Development (WSSD) to be held in Johannesburg, South Africa, in early September 2002. One of the responsibilities for the IS&TC was the preparation of a 16 page report for the United Nations providing the priorities and commitments by the IS&TC for the future.

In order to carry out this important facilitating role, the ICSU Executive Board has established a "Consultative Group for the International Scientific and Technological Community" (CGST) to oversee and facilitate the preparations for the WSSD.

In addition, the ICSU Executive Board has established an ICSU-WSSD TASK FORCE to ensure that ICSU provides its own targeted, relevant and visible contribution to the IS&TC preparatory process.

We have been asked to appoint a focal point person within IUPESM to enable ICSU to ensure that we are kept fully informed and hopefully actively involved in the work of the Task Force and this WSSD process. The first major commitment for ICSU was to prepare the 16 page Report for the United Nations by 1 December 2001.

Nandor Richter has kindly accepted to serve as focal person for ICSU and has worked on documents sent by ICSU. Nandor has proposed to send a contribution of 1-2 pages hoping our activities will be included in the 16 pages report from ICSU. Keith Boddy wrote our contribution which was sent in November to ICSU.

(Annex 2_1 page)

2001, November 22

Keith Boddy wrote : *Mon cher M. le Président,*

>As you and Council will be aware, there several Interdisciplinary Bodies already established within ICSU on a range of topics. I suggest that IUPESM should propose to ICSU the establishment of a 'Sciences in Health Care' Group or Interdisciplinary Body, as none currently exists. In addition to representing a potentially major IUPESM initiative and raising our profile, we could play a leading role in such a body if there were a positive outcome.

(see September 2002 ICSU General Assembly)

2002, February Grant Programmes 2003

Two collaborative Grants Programmes were submitted for consideration by ICSU.

1) *The Lung Physiome: modelling from gene to whole organ.*, on behalf of IUPS and IUPESM and also supported by IUTAM. Dov Jaron has made some useful suggestions incorporated in the final document.

2) *E-learning environment in telecommunication for developing countries*, on behalf of URSI and IUPESM. The basic aim is to Bridge the Digital Gap between North and South and to participate in the supply of material for e-learning training centres in the third world.

2002, April

IUPESM 2001 report for inclusion in the ICSU 2001 Annual report. (Annex 3_1 page)

2002, August 26, September 4 World Summit on Sustainable Development

Organisation of a Forum on Science, Technology and Innovation for Sustainable Development (a parallel event to the World Summit on Sustainable Development)

The South African Government has organised, as a parallel event to the World Summit on Sustainable Development, a Forum on Science, Technology and Innovation for Sustainable Development. The objective of the event was to provide a platform for highlighting the critical contributions of science, technology and innovation to sustainable development. It has brought together not only members of the science and technology community, but also policy- and decisions-makers, including representatives of civil society and industry, to debate and consider effective mechanisms to harness the immense potential of science, technology and innovation to contribute to sustainable development.

During this Forum, 26th August to 4th September, comprising a series of seminars, workshops and colloquia, a session on "*Sustainability of Healthcare Delivery Infrastructure and associated technologies: Capacity building and new management approaches*" was held Wednesday 28th August 18:00 – 19:30

The highlights of this session were as follows: As part of the health system reform process in many countries, and in the light of new healthcare delivery challenges, there is a need to address the management of resources

required for sustainable delivery of quality healthcare services. These resources include health facilities / buildings, medical and other healthcare equipment, drugs and other consumables, and human resources as well as supporting information-, communications- and transport systems. This session focussed on recent developments pertaining to health intervention resource management, and specifically on capacity building initiatives and "systems-view" management approaches.

Mladen Poluta IFMBE treasurer, one of the organisers of this session gave his talk entitled "*Capacity Building initiatives and the role of international/regional organisations (WHO, IFMBE, IUPESM, AFTH)*"

13 June 2002

Message from Keith Boddy

I am happy to advise you that 5000 copies of the Brochure have been delivered to IPEM in York as planned. In addition, IPEM has 1000 copies and the Institute of Physics in London has 1600 copies which they purchased and will send some to the "great and the good" in the UK.

27th GENERAL ASSEMBLY of ICSU

23-28 September 2002 Rio de Janeiro, Brazil

1) ICSU Priority Area Assessments

The 27th ICSU General Assembly held in September approved the proposal by CSPR to develop ICSU Priority Area Assessments (PAAs). CSPR has decided to initially launch three PAAs of Environment, Capacity Building and Data and Information, starting with the one of the Environment. ICSU asked to nominate individuals who would be appropriate as members of these ad hoc panels/committees Kwan-Hoong Ng is candidate for the PAA Scientific Data and Information.

2) Meeting of all the Bio-related unions

As following the suggestion from Keith Boddy in the Paris ICSU meeting, there was a meeting summary_ (annex 3_1page) of all the Bio-related unions during lunch one day. The purpose of the meeting was to find ways in which these unions can collaborate and work more closely together .Dov Jaron, our representative to the General Assembly of ICSU, made a case for starting an ICSU initiative on "Science for Health and Well Being" and the suggestion was accepted with great enthusiasm.

The BioUnions were planning on generating a draft with input from each and then having a meeting in Paris February 2003 to discuss implementation.

1 October 2002

130 letters personal with a sample of the brochure have been sent to Scientific Associates and other members of ICSU.

1 February 2003

IUPESM contribution for inclusion in the ICSU 2003 Year Book.(Annex 4_1 page)

10-11 February 2003

Meeting in Paris of the Biounions

Implementation of the initiative on " Science for Health and Wellbeing".2 days of brain storming attended by J.P.Morucci

21 April 2003.

" Science for Health and Wellbeing"

"Science for Health and Well-being" is the outgrowth of a discussion at the ICSU General Assembly in Rio last September, and a development meeting in Paris this past February. Annex 5 -16 pages-gives an Executive Summary of the minutes, the minutes of the meeting and drafts of three thematic working papers.

20MAY 2003

World Summit on the Information Society- the Scientific Input

The UN World Summits on the Information Society (WSIS) will take place in Geneva on 10/12 December 2003 and in Tunis 2005. Full information on the Summit can be found on <http://www.wsis.org>

As discussed at the General Assembly in Rio in September last year, it is important for ICSU, as a representative body of the international science community, to participate in the preparations for WSIS and try to influence the outcomes such that due account is taken of:

- i) the importance of science for the future development of the information society,
- ii) the requirements of the scientific community from that information society.

Data and information and the ICT infrastructure are at the very centre of the scientific endeavour and scientific research is certainly one of the most important factors underpinning the development of the information society. Scientific research leads to the development of new technologies themselves and the production of data and information that, when combined with these technologies, can be of huge benefit to society as a whole.

ICSU believes that the essential role of science and scientists should be clearly acknowledged in the declaration of principles and reflected in the plan of action from WSIS

Following on from these two events, an ICSU, CODATA, UNESCO Workshop was organised on 12 March 2003 at UNESCO on Science in the Information Society. The overall aim of the workshop was to identify and refine the key messages that the international S&T community may want to convey to the other stakeholders in the information society during the WSIS process.

A one page document (Annex 6) outlining the Principles and Recommendations from the _Science in the Information Society_ workshop has been proposed by the scientific community participants at the Workshop on 12 March 2003. An official letter of endorsement of this document from IUPESM has been requested by ICSU and sent.

28 MAY 2003. Universality and related principles.

At the General Assembly in Rio de Janeiro in September 2002, the Standing Committee on Freedom in the Conduct of Science (SCFCS) was charged with undertaking a review of Universality and related principles with the intention of clarifying definitions.

At a meeting last March, the Review Group on Universality and related principles

* sought to identify the key rights of scientists for the defence of which ICSU is, or might reasonably be, looked to for action,

* considered how best those rights might be expressed in terms of principles to be upheld,

* reviewed implied responsibilities of ICSU Members and of individual scientists,

* considered possible roles for ICSU itself, for Members and for individuals in upholding principles adopted.

The Group reached some initial conclusions falling into three groups (see annex 7_6 pages))

* a definition of Principles - summarised in a draft revision of ICSU Statute 5 (see Appendix 1)

* shared responsibilities - the case for a broader-based defence, within the ICSU family, of the principles adopted and how that might work (Appendix 2)

* responsibilities of individual scientists (Appendix 3)

We have been invited to reply ,in Appendix 4, to a set of key questions which will not be taken as implying any commitment by our Union.

July 2003 Establishment of an ad hoc Expert Panel in Capacity Building in Science

The Annex 8 (5 pages) gives the terms of reference for the ICSU Priority Area Assessment on Capacity Building in Science. IUPESM has been invited to submit nominations by September 2003 and the candidates can fill the template in Annex 9 (2 pages) for submission and approval by the new AC, before sending to ICSU.

Important dates for the future

9-10 February 2004

The Executive Board of ICSU agreed that the next meeting of the Unions should be held in Paris on Monday, 9 and Tuesday, 10 February 2004, immediately prior to the meeting of the Board on 11-12 February.

October 2005

Further to the acceptance by the 27th General Assembly of the invitation from the China Association for Science and Technology (CAST) to host the 28th ICSU Assembly in China, the dates for this have now been fixed for the week of Monday, 17 October 2005. The GA is expected to last five days (three days of business meeting, one day (half each) for scientific symposia and visits, and one day for the Unions' and National Members' Fora), with a one day meeting of the Executive Board both immediately before and after the Assembly.

Recommendation

From my experience and my contacts with ICSU, I suggest, as a priority, that IUPESM should commit itself deeply in the Health Care project and seek a focus on direct patient care both in Industrialised Nations (Value for Money, or otherwise, of new technologies) and in Developing Countries, especially providing Internet accessible knowledge, journals, textbooks, etc.

Annex 1

International Union for Physics and Engineering Sciences in Medicine (IUPESM) <http://www.iupesm.org/>

Capacity Building International Activities in the field of Medical Physics and Biomedical Engineering

Introduction

The principal objective of IUPESM and of its two founding Constituent Organizations-the *International Federation for Medical and Biological Engineering (IFMBE)* and the *International Organization for Medical Physics (IOMP)*-is to contribute to the advancement of physical and engineering sciences in medicine for the benefit and well being of humanity. Medical Physics and Biomedical Engineering are one of the most dynamic and complex fields of science. The subject of these professions covers all medical technology from computerized pacemakers to magnetic resonance scanners. All these equipment apply the newest developments of our time and require extremely high-qualified workforce. Additionally, the use of medical technology is closely linked with human health and life. Due to this reason special care is taken for the education, training and continuing professional development of medical physicists and engineers.

IUPESM has several key programs relevant to and symbiotic to Capacity Building:

The IUPESM program entitled “Education, Training and Continued Professional Development for the 21st Century” is strongly orientated to developing and “emerging” countries. The program organizes regional training courses and enables young scientists to attend IUPESM Congresses, including the World Congress. During these events, special awards are given to young scientist who present successful papers. The Education and Training Committee (ETC) to the International Organisation for Medical Physics (IOMP) aims to assist and promote internationally sponsored Education and Training Programs cosponsored by IOMP National Member Societies and/or Regional Organizations. ETC has Policies and Application Form for supporting such activities. In the last 4 years such activities have been supported in Egypt, China, India, Bangladesh, Mexico, Brazil, Romania, Estonia.

IUPESM supports Eastern European countries and other countries in transition to enable their scientists to attend IUPESM conferences.

Another program on global biomedical information networking and implementation for developing and emerging countries provides education material (i.e., text books) on Medical Physics on the Internet. IUPESM is currently preparing an Encyclopedia of Biomedical Engineering.

Capacity Building Activities

A. Courses, Seminars and Sessions (in the period 2000-2001)

1. Regional Course with Workshop on Medical Physics - Imaging, Dosimetry & Radiotherapy
Venue: Kuala Lumpur, Malaysia, April 2000.
2. Education/Training sessions at the World Congress of Medical Physics and Bioengineering
Venue: Chicago, USA, July 2000
3. International Seminar with 3 Workshops on Medical Radiation Physics Training
Venue: Prague, Czech Republic, September 2000
4. International Conference on Radiation and its Role in Diagnosis and Treatment
Venue: Tehran, Iran, October 2000
5. Regional Course on Contemporary Magnetic Resonance and Diagnostic Radiology Imaging
Venue: Sofia, Bulgaria, October 2000
6. International Conference on Medical Radiation Physics and Engineering
Venue: Lisbon, Portugal, November 2000
7. South East Asian Medical Physics workshop - Continuous Quality Improvement in Medical Imaging and Radiotherapy
Venue: Kuala Lumpur, Malaysia, april 2001
8. Regional Seminar on Training and Education of medical physicists of Russia and neighboring countries
Venue: Moscow, Russia, June 2001 (approved, in preparation)
9. European Short Course (Summer School) on Quality Assurance in Contemporary Imaging and Radiotherapy
Venue: Belfast, UK, September 2001 (approved, in preparation)
10. Refresher Courses on Medical Physics and Diagnostic Imaging
Venue: Bangkok, Thailand, November 2001 (in preparation, pending approval)
11. International Conference on Medical Physics and Engineering
Venue: Caracas, Venezuela, November 2001 (in preparation, pending approval)

B. International projects (in the period 2000-2001)

1. Project Tempus “Baltic Biomedical Engineering and Physics Courses - BALMEP” (countries: Sweden, UK, Estonia, Latvia, Lithuania). The project developed an MSc course in Medical Engineering and Physics now used in several countries. Published

one book with Course curricula and detailed syllabi (in English). Web site:

http://www.rtu.lv/fakult_lapas/mzf/eemti/BaltTemp.html

2. Project Erasmus " Training and Education in Medical Physics and Engineering Reform in Europe - TEMPERE" (countries: Greece, Austria, Belgium, Denmark, Germany, Spain, Finland, France, UK, Ireland, Italy, Netherlands, Norway, Portugal, Sweden, Iceland). The project developed recommendations for building and accreditation of Education and Training courses in Medical Physics and Engineering.

3. Project Leonardo "European Medical Radiation Learning Development - EMERALD" (countries: UK, Sweden, Italy, Portugal, France, Ireland, Czech Republic, Bulgaria). The project developed three international training modules with special materials (published 3 training CD-ROMs). The materials are used in various institutions in the following countries: Australia, Austria, Belgium, Brazil, Bulgaria, Croatia, Czech Rep., Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Latvia, Lithuania, Malaysia, Malta, Mexico, Norway, Poland, Portugal, Romania, Russian Federation, Slovak Rep., Slovenia, Spain, Sweden, Turkey, UAE, UK, Ukraine, USA. Web site: <http://www.emerald2.net>

C. International Education/Training Publications planned for 2001

1. "Medical Radiation Physics - A European Perspective" (second edition), Publisher King's College London.

Electronic book (Internet distributable) containing information for Medical Physics education in most of the countries in Europe (pending July 2001). Information from web site: <http://www.emerald2.net>

2. "Medical Physics Training in Europe" (working title), Publisher King's College London.

Electronic book (Internet distributable) containing information for Medical Physics training in most of the countries in Europe (pending September 2001). Information from web site: <http://www.emerald2.net>

3 Book with Recommendations for building and accreditation of Education and Training courses in Medical Physics and Engineering. (English, in print). Web site: <http://www.inbit.gr/fine-tempere>

D. Global Listing of Graduate Programs in Medical Physics

This activity was initiated in 1999 and continued during the present years. It aims to collect data for all Educational Programs (courses) in Medical Physics around the world. Web site: <http://www.iomp.org>

Information collected so far from the following countries:

Argentina (Buenos Aires), Australia (Adelaide), Bulgaria (Plovdiv), Canada (Montreal), Colombia (Santafe de Bogota), Ecuador (Guayaquil), Finland (Helsinki), Finland (Tampere), Finland (Turku), Malaysia (Kuala Lumpur), Mexico (Mexico), New Zealand (Hamilton), Philippines (Manila), Poland (Krakow), Russia (Moscow), South Africa (Medunsa), Thailand (Bangkok), USA (Detroit, Michigan), USA (Lexington, Kentucky), USA (San Antonio, Texas), USA (Madison, Wisconsin), Venezuela (Caracas)

E. Libraries

The IOMP Developing Countries Medical Physics Libraries program has established 78 Medical Physics Libraries in over 50 countries. A list can be found at <http://www.iomp.org/library.html>.

F. Public Awareness

IUPESM's public awareness and education activities include the on-line and hard copy publication of a brochure aimed at governmental and public understanding of present and future innovations in the physical and engineering sciences in medicine and their implications for health, and the care of patients.

Conclusion

The Capacity Building International Activities in the field of Medical Physics and Biomedical Engineering described above have been strongly underpinned by the personal enthusiasm and dedication of many colleagues all around the world, to whom we are cordially thankful.

S. Tabakov

Annex 2

INTERNATIONAL UNION FOR PHYSICAL AND ENGINEERING SCIENCES IN MEDICINE

SUSTAINABLE DEVELOPMENT AND PUBLIC UNDERSTANDING OF SCIENCE AND TECHNOLOGY: HEALTH CARE

In considering Sustainable Development and Public Understanding of Science and Technology, Health Care is not always highlighted and particularly the contributions made to it by Physical and Engineering Sciences.

As infectious and endemic diseases decline in Developing and Emerging Countries, medical conditions such as cancer, circulatory diseases and physical/mental disabilities increase in significance. There is consequently a greater necessity for the associated expertise and support of Medical Physicists and Biomedical Engineers in both diagnosis, such as imaging and physiological measurements, and in treatment, particularly radiotherapy and also in aids to everyday living for people with disabilities. These professionals are also prime contributors to essential developments in fields such as telemedicine and information technology.

A major problem in Sustainable Development is that generally the number of Medical Physicists and Biomedical Engineers per head of population is far fewer in Developing Countries than in Industrialised Nations (often by orders of magnitude). In addition, their professional status and roles may be poorly recognised or understood. An associated difficulty is limited opportunities to remain up to date in these rapidly advancing fields.

Health Care is of direct interest and personal benefit to the public. An opportunity, therefore, exists to improve and stimulate Public Understanding of Science and Technology by illustrating the many applications being made internationally to improve wellbeing, explained in non-technical, readily understandable language.

As a member of ICSU, the International Union for Physical and Engineering Sciences in Medicine (IUPESM) is contributing to Sustainable Development by providing Regional Training Courses for Developing Countries and supporting their participation in World Congresses. Global Biomedical Information Networking is being established for them, including an on-line Medical Physics Textbook and a Biomedical Engineering Encyclopaedia. As a contribution to Public Understanding of Science and Technology, IUPESM has produced an illustrated brochure entitled “Physical and Engineering Sciences in Health Care”, which is available on the Union’s web site (www.iupesm.org) and, with the assistance of a grant from ICSU, in printed form. The Union is seeking collaboration with members of the ICSU and United Nations families in order to promote and extend these contributions to Sustainable Development and Public Understanding.

Annex 3

Summary of Meeting of Bio and Other Interested Unions ICSU General Assembly 9/27/02

The meeting was called and chaired by M. H. Wake, President, IUBS. 15 people attended, representing nine different unions (IUBS, IUGG, IGU, IUNS, IUPAB, IUPAC, IUPESM, IUPsyS, IUSS).

All agreed on the need to facilitate interdisciplinarity by forming effective partnerships that transcend disciplinary borders. The relevance of the BioUnions reducing the impression that biology is fragmented and territorial was so apparent that it merited no discussion, interest being focused on developing partnerships. A number of suggestions were made about ways of developing interactions; most discussion treated the idea of developing an action plan oriented around the over-arching theme "Science for Health and Wellbeing". It was generally agreed that a series of activities/partnerships that emphasise nutrition, the environment, energy, and the human dimension could be developed soon. The following framework for development was proposed and accepted:

1. Wake will send minutes to the participants, and other relevant people;
2. Each Union will be asked to do a précis of the interaction/work plan that it envisages under the theme; Wake will circulate the précis and ask for comments; potential work plans will be prioritised;
3. Other Unions and interdisciplinary bodies (e.g., IUBMB, IUMS, IBRO, DIVERSITAS, IHDP) will be approached about their interest in participation;
4. A meeting of interested parties will be held in Paris, probably during the period of Feb. 10-12, 2003, to develop one or a series of proposals for the ICSU grants deadline March 1, and for other funding. The meeting will be mostly self-funded by the Unions, and ICSU will be asked for assistance.

Other suggestions included:

1. Invitations to each other's general assemblies, with such inducements are real participation in symposia, etc., and waiver of the registration fee for one Union member;
2. Development of joint capacity-building activities;
3. Potentially sharing facilities;
4. Contacts among Union Presidents and Secretaries General and ICSU to help to prepare the agenda and objectives of the next mid-term Unions meeting;
5. Interested Union representatives meet one day before the 18-month meeting.

Attendees and their e-mail addresses:

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Annex 4

International Union for Physical and Engineering Sciences in Medicine (1999)

<http://www.iupesm.org>

IUPESM

The International Union for Physical and Engineering Sciences in Medicine was founded in 1980 by its Constituent Organisations, the International Federation for Medical and Biological Engineering and the International Organization for Medical Physics. Through its adhering national societies in almost 80 countries, the Union comprises a global network of physical scientists and engineers dedicated to improving health care and well-being worldwide, especially in Developing Countries.

The objectives of IUPESM are to contribute to the advancement of medical science and technology; to organise international cooperation and promote communication among those engaged in health care science and technology; to coordinate activities of mutual interest to the engineering and physical sciences within the health care field, such as international and regional scientific conferences, seminars, working groups, regional support programmes and scientific and technical publications; and to represent the professional interests and views of engineers and physical scientists in the health care community.

IUPESM has sponsored triennial World Congresses for some 20 years.. The proceedings have been published as supplements of *Physics in Medicine and Biology* and/or *Medical & Biological Engineering & Computing*, two of the official journals of IUPESM. The Millennium Congress was held in Chicago with more than 4600 attendants including about 900 students as well as 1100 exhibitors. In addition to the World Congresses, regional scientific meetings, educational courses (especially in Developing Countries) and sub-speciality scientific conferences are sponsored at the rate of 8 to 12 per year in various parts of the world. Copies of journals, monographs & Newsletters are provided free of charge to 82 libraries in 55 Developing Countries. Much work is done via Regional Groups, the longest established being those in Latin America, Europe and Asia Pacific.

The 2003 World Congress on Medical Physics and Biomedical Engineering will be held in Sydney (Australia) from 24 to 29 August 2003.

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Vice-President C.ORTON(USA^o)

Past President K. BODDY (UK)

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Annex 5

ICSU Unions Meeting to Consider the 'Science for Health and Well-being' Initiative Paris 03-02-10/11

Participants

| | |
|---|----------------------------------|
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Session 1. 10.02.03 Morning

At a lunch meeting at the ICSU General Assembly in Rio de Janeiro in September, 2002, representatives of several Unions decided that an ICSU cross-union collaboration initiative should be developed. The overall task is to develop a unique contribution representing the competence of the ICSU bodies.

The present meeting is characterised as a 'brain-storming session' to delineate the scope of the initiative and to formulate a mission statement, as well as potential areas for collaboration.

Dr Pierre Ritchie was unable to participate in the meeting but sent a letter which comments: 'the initial proposal from our collective group needs to be very high quality to ensure longer term credibility with the Committee on Scientific Planning and Review (CSR/P) and ICSU, a full scale proposal for 2004 might be ideal, its feasibility remains to be determined.... I believe it is valuable for the group to strongly recommend the theme of health (with or without elaboration) as a priority for the 2005 grants. If it is feasible to propose a 'seeding activity' for the 2004 grants (due March 1) that would be fine....' (He commented as an individual, rather than a representative of CSR/P or his Union.)

A presentation was made by Dr. Anne-Hélène Prieur-Richard (DIVERSITAS) on the Global Change Program, a coordinated activity initiated in 2001. The Earth System Science Partnership is a joint effort including the International Program of Biodiversity Science (Diversitas), International Human Dimensions Program on Global Environmental Change (IHDP), World Climate Research Program (WCRP) and the International Geosphere-Biosphere Program (IGBP). The program studies the environment and its effect on humans but essentially leaves out health aspects. It shows for instance that an increased biodiversity in water may have a beneficial effect on the vector-borne zoonosis whereas reduction of predators may increase the rodents and other animals that carry the Lyme disease. Human migration may transfer parasites to previously uninfected areas. Changes in temperature may facilitate the spread of vector-borne diseases, e.g. malaria, to other zones. A scoping meeting will be arranged in Paris in February with participation of the above-mentioned bodies and WHO under the chairmanship of Prof Tony McMichael, Australia, and Prof Ulisses Confalioni, Brazil.

In the following discussion Prof. Thomas Roswall informed the group that the evaluation of the ICSU in 1995 suggested that the Council should strengthen its collaboration with several different organisations and scientific fields. This has been largely achieved except for the health sector and the present ICSU initiative is one effort in that direction. There has been a lack of concerted action from the health sciences but now the medical academies of sciences are preparing a program for child health. The ICSU welcomes help to fill the gap to reach the UN millennium goal and to foster science and technology for sustainable development.

The discussion then went on to identify areas where science might have most impact; these included the following topics:

- Health needs to be expanded to include well being as defined by WHO for year 2000. Quality of life = well-being?
- Increase of life expectancy reduction of disabilities (WHO).
- Top ten diseases contributing to life expectancy are nutrition based.

- ✂✂ Nutrition deficiency may affect the immune system.
- ✂✂ Point of care instrumentation and technology.
- ✂✂ Modern cooking and farming technologies may increase previously unusual deficiency syndromes.
- ✂✂ Minimising environmental risks and adverse effects of drugs, nutrients and life style, e.g. urban and rural settlements.
- ✂✂ Sustainability of food supply.
- ✂✂ Mental illness and other vulnerability factors. Psychological effects of physical disabilities, e.g. stress in modern life style.
- ✂✂ Use of virtual realities in psychology research.
- ✂✂ Technical advances in brain imaging, MRI, etc.
- ✂✂ Much is already known on factors influencing health and well-being. Educational efforts should be intensified and begin at an early age; an example of an effort in Finland is the development of ‘scientific fairy tales’ to teach children all aspects on beneficial and adverse effects.
- ✂✂ Improve ‘literacy in health, environment, ecosystems, science and technology’.
- ✂✂ Enlarge the curriculum for medical students in this area.
- ✂✂ Create an educational, certified database on the web.
- ✂✂ Develop use of telemedicine and imaging technologies.
- ✂✂ Knowledge transfer to developing countries.
- ✂✂ Everybody should have the right to health education.
- ✂✂ How can science and technology underpin well-being?
- ✂✂ Effects of micro- and nanotechnology.
- ✂✂ Measures of well-being are deficient (income, products and national health budget were mentioned).
- ✂✂ Access to water and sustainable water supplies.
- ✂✂ Can our discussion contribute to the evaluation of GMOs? Political issue. Interests of Europe and ‘developing’ countries vs. those of USA?
- ✂✂ Biometrology is an established science
- ✂✂ The ICSU should seek new questions to the answers we already have.
- ✂✂ Create an environment where one or more of the Unions could take the lead and enable different sets of Unions to formulate questions that can be addressed by ICSU.
- ✂✂ Attract the ICSU members and then address and attract the public.
- ✂✂ Develop partnership between companies and scientific organisations.
- ✂✂ Discuss the business opportunities and risks.
- ✂✂ Encourage policy-makers and politicians from the unions to meet and discuss or present their scientific and technological progress and its implications for health care.
- ✂✂ Prepare an inventory of ongoing projects in science and technology that have a bearing on human, environment and animal health

Based on the discussion and the points raised, the following consensus statement of the scope of our proposed initiative was agreed upon:

Science for Health and Well-being

Preamble

We recognise that the health sciences require the partnership of a broad range of sciences and technologies to advance human health and well-being. The initiative ‘Science for Health and Well-being’ is a collaborative effort by ICSU Unions and other ICSU bodies to promote the elaboration and utilisation of the scientific information appropriate to understanding human and environmental health and well-being in its many dimensions.

The goals of the initiative are to

- 1 demonstrate the extent to which a range of science and technology is important to health and well-being,**
- 2 educate (at multiple levels) about science and technology using modern means of communication,**
- 3 collaborate to identify areas unmet and produce new ideas, science and technology partnerships to look to the future, and**
- 4 develop an inventory of ongoing programmes, activities in order to identify unmet needs**

in order to

empower the science community, public and policy-makers and in all countries with the knowledge base to effect their health and well-being.

Session 2. 10.02.03 Afternoon

Carthage Smith (ICSU) (formerly with Medical Research Council in UK) commented:

the absence of medical/clinical sciences in the ICSU family was an issue noted in ICSU assessment (Schmidt report);

the absence of integration was also evident in the ICSU preparations for Johannesburg, though IUMS did participate in the science forum at the Summit;

Millennium goals, including improving human health, were prominent in Johannesburg declaration.

He suggested this group might pursue the following links:

1. Inter-Academy Medical Panel a new organization; not clear if it will advance beyond holding meetings-- David Challoner at US IOM and Guy deThe at Pasteur

2. World Health Organization

Sachs report puts health at the center of the development agenda;

David Navarro at WHO is the new head of the section on sustainable development;

This group must decide how to link with several components...

David Weatherall report new genomics and development; an opportunity for the developing world; population growth and disease more serious there;

annual conference on genomics and the developing world afoot? Who will organize? ICSU unions?

He further commented on the Health and Wellbeing initiative in the ICSU context

ICSU is now focusing on future priorities--

health has been largely a 'side issue' for ICSU for many years;

the problem is to define what ICSU can do with comparative advantage--

it does not need a long list of obvious topics for its work;

it needs an agenda that identifies comparative advantage and distinctive, if not unique, contributions;

a consensus document regarding science and health to feed into the CSPR emerging issue exercise would be extremely helpful.

Smith briefly discussed other relevant ICSU programs --

We heard about DIVERSITAS initiative from Prieur-Richard;

Several Unions such as IUMS and bodies such as SCOPE do some health-related projects, but he is not aware of any major inter-disciplinary initiatives within ICSU;

There are funding opportunities within ICSU, WHO, and elsewhere.

The Schmidt report (external review of ICSU) lends support for the idea of moving deliberately, especially because of the need to build links with WHO in order to proceed without missteps; on the other hand, unions are constantly in flux. Perhaps a middle ground is modest funding (from ICSU?) to be certain that this effort survives the normal changeover within the unions, and the accompanying shifts in priorities

Smith commented that many unions have their own direct contacts with WHO, but there is probably merit in

consolidating them under the broader ICSU umbrella. ICSU grants are meant to be used as seed money,

bringing together different ICSU bodies around common interests, and CSPR would be very interested in good health-related proposals.

Smith believes that in order to properly address health issues we must engage the clinical community:

Consensus within the group that contacts and understandings with WHO should be pursued quickly and vigorously.

Smith addressed several questions:

How distinct or unique need the health and wellbeing initiative be?

Smith urged that we stress interdisciplinary and multinational facets, which enables this group to address issues more narrowly -focused efforts cannot grapple with effectively.

He noted that ICSU funding for global environmental change programs is for the *coordination* of research, not for the research itself.

Wahlquist commented that we need to demonstrate that we can do what is needed with specific examples of past accomplishments.

What can we expect from WHO?

Smith noted that the recent leadership change is an inherent opportunity. He also stated that internally, we have to find our points of commonality and synergy; externally, we need to explore external relationships and funding opportunities. We need to do both in parallel.

What would be the impact on health of fuller participation by the non-medical and non-health sciences?

As well as helping to fulfill ICSU's mission of strengthening international science for the benefit of society, a focus on health and well-being could rebound to the benefit of ICSU's prestige and visibility within the world of science.

Is there a role for UNESCO?

Smith stated that WHO has the lead on health in the United Nations; UNESCO focuses on science per se, though ICSU sometimes finds itself playing a bridging role among UN agencies and organizations.

What is the audience for what we're trying to do here? Who are the players? What outcomes do we seek? Should focus more on those questions.

Open discussion ensued: Wahlquist proposed spending the rest of the day formulating a proposal to WHO and InterAcademy Medical Panel to fund identification of key issues in health and wellbeing by this group during the next twelve months. Deliverable to be a report to ICSU and WHO due in May 2004. No clear decision from the group regarding the proposal but agreed to by absence of an alternative.

Purview could profitably be extended to the science community (including medical science) as well. Many of our members are insular. Should do what we can to counter specialization and parochialism. Need also to address policy makers.

One of our major contributions would be to demonstrate that funding for the broader science community is as important to human health and wellbeing as funding for the biomedical sciences. The non-medical and non-health sciences have a lot to offer medical science and health. Would also be a major contribution to ICSU's effectiveness.

Seek private partners?

WHO linkages schema to be pursued.

What can this group and WHO do for each other?

Related question is what to expect from ICSU?

Prior experience with WHO has been mixed, and not certain what resources they have to offer. May have to focus on collaboration rather than funding of research external to their own programs? A productive strategy may be to work jointly with WHO on funding from third parties.

Key concepts and words for WHO effort (topics, *etc.* in which we are interested that might be attractive to WHO).

- v Stories (with translations) and context - and culture-specific adaptations.
- v Electronic linkages.
- v Clearinghouse?

Developing and maintaining a complete and useful electronic information portal is not a simple task. CCBS is already developing an education clearinghouse/portal in collaboration with IAP and the French Academy of Sciences.

- v Global burden of disease. Mechanisms by which ways of life contribute to different diseases in different times and places. Disease clusters and complexes do exist. What is missing in WHO's work is the degree to which environmental factors contribute to the top ten diseases worldwide. Zinc deficiency, for example, is number 6 or 7 as a world health problem. Obesity and diabetes result from inability to exercise safely. Focus should be on indices and measurement.
- v Focus should be on common action drawing upon the many facets represented at this meeting and within the ICSU family. Should refocus on the kinds of collaboration that will be effective within the ICSU family. Worry about external constituencies later?
- v As regards education, how many unions have commissions on education, and does their purview range from elementary school through post-secondary education?
- v Could focus on metabolic diseases and computer-related diseases.
- v Are there unrecognized facets of such diseases as obesity and diabetes that the non-medical and non-health sciences can identify? Can we demonstrate and document the oversights?
On-line discussion on information society being launched today that will be the major ICSU consultation with the scientific community regarding information technology in advance of the Summit in Geneva 2003 and Tunis 2005.

Possible topics to pursue (parallel with WHO contacts) and ways that members of the ICSU family might collaborate, on what topics, what would be produced, and for whom (need one page summaries for tomorrow)

- v Water availability and water quality
- v Air pollution at household and larger scales
- v Ozone hole and amphibian reproduction and speciation
- v Foodways and disease
- v Urbanization (and megacities) and resulting stress and disease
- v Technological sources of disease, including virtual reality and internet addiction (Denis)
- v Terrorism and disease
- v Self-diagnosis and self-treatment of disease (Wahlquist)
- v Diabetes and obesity and the limited success of science in counteracting them

Overarching concepts for these specific topics

- v Living Environments
 - Foodways
 - Introduction of modern culture
 - Microorganisms
 - Psychological stress
 - Settlements, especially cities and megacities
- v Water
- v Technologies and Cultures

Session 3. 11.02.03 Morning

Development of themes

The participants divided into 3 groups to prepare an outline of possible activities on 3 themes under the headings: topic of focus, potential Unions involved, outputs, audience. The chairs of the groups were:

Living Environments (Ron Abler, IGU)
Water (Jo Anne Joselyn, IUGG)
Technology (Michel Denis, IUPsyS).

Output should be a document that sets out themes around which unions can collaborate.

The session started with some general discussion on the topics to be included in each group. It was noted that there are significant overlaps, (water is relevant to environments; technology impinges on most things.) There are also social factors that could not be properly addressed within this group.

Each group reported back to the full meeting.

Living Environments

The report from this group was circulated (See Working Paper #1, page 10).

Water

The report from this group was circulated (See Working Paper #2, page 13).

There was discussion on the need to specify minimum requirements for water. There would be cultural factors involved.

There was a question on how to bring these issues into a coherent plan to link water with healthcare. All of these topics have been studied individually, how should they be integrated? A conceptually cohesive proposal is needed.

MW(ake) suggests that topics be enlarged and then developed into full themes. Input from health scientists is necessary. Consumption of water is an indication of wealth.

Technology (See Working Paper #3, page 15)

Input had been made from Michel Denis that was concerned with the functions of the nervous system, and this was used as the definition of the topic. A separate paper was circulated summarising the discussions.

Food technology was considered to be another important topic because it has a significant impact on nutrition, which in turn has an impact on mood (depression). Alcohol is another aspect, as are computer games.

Further development of topics

Leaders of the teams above were asked to develop the themes for further discussion within the Unions. The procedure would be:

Rapporteurs to send text to MW.

MW will put these together and send to all participants with a request to send comments to chairs.

Chairs to flesh out descriptions and return to MW for final editing to send to Unions and ICSU.

It was considered to be important to plan further action at all levels: science and strategy. We could consider looking for funding from European Commission (Framework Programme 6) and from other sources because of the seriousness of health problems, particularly in Africa. The World Bank is another possible source of funding. A good proposal was an essential prerequisite.

MW suggested two further developments: a recommendation to ICSU and interchange of people at Union meetings (Council and Conferences), and also at lower levels (task forces, working groups, committees) within the Unions.

Session 4. 11.02.03 Afternoon

Decisions at Final Session:

1. That the consortium adopt *a strategy to fulfill the mission statement* which would include:
 - (1) *Develop core domains* for inter-union collaboration:
 - (a) *Living Environments*
Chair: Professor Ron Abler (IGU)
 - (b) *Connections between water and health*
Co-Chairs: Professor Joann Joselyn (IUGG)
Professor Ian Dowman (ISPRS)
 - (c) *The Impacts of Technology on Health and Well-being*
"The Functions of the Nervous system, Behaviour and New Technology"
Co-Chairs: Professor Michel Denis (IUPsyS)
Professor Ove Petersen (IUPS)

Advice will be sought on these domains from interested Unions as to how they might generate projects and funding proposals.

- (2) *Seek Alliances* between the ICSU consortium and major international partners in "Science for Health and Well-Being", using the "Core Collaborative Domains" document, especially with:
 - (i) *WHO*
 - A delegation to be led by the Executive Director of ICSU, Professor Thomas Rosswall, accompanied by the Consortium Chair, Professor Marvalee Wake, and the Chairs of the "Core Collaborative Domains" working groups
 - To meet the new WHO Secretary -General, Dr Lee, of South Korea
 - (ii) *WMO*
(World Meteorological Organisation)
 - (iii) *International Social Sciences Council*
at UNESCO, Paris
(especially the International Association of Sociologists)
 - (iv) *World Medical Association (WMA)*
 - (v) *The EU Science/Development Secretariats*
as well as
 - (vi) The Private Sector
 - (vii) Foundations
 - (viii) NGOs.
- (3) (i) To promote *conjoint events at Union Conferences*, particularly in the form of Symposia and Workshops involving 2 or more Unions, with the underlying theme of Science for Health and Well-being, invited speakers, etc.
(ii) An index of Union meetings will be established in a more current and comprehensive fashion on the ICSU web-site *and*
(iii) Union web-sites will direct to each other's sites for information about their meetings.
- (4) ICSU will compile information on *UN Resolutions on Well-being and Sustainable Development*, to form a basis for future development of the "Well-Being" agenda.
- (5) To recommend to ICSU the following: **The representatives of ICSU Unions and ICSU bodies (IGU, IUBS, IBRO, IUGG, IAHS, IUNS, IUPAC, IUPESM, IUPS, IUPsyS, ISPRS, and SCOPE), assembled 10-11 February 2003 to consider an initiative for multi-Union collaboration, strongly recommend to ICSU that it consider the general topic of the relationships and contributions of science, broadly construed, to maintain and increase the health and wellbeing of humans and all other living species as a primary focus for funding for 2005.**

Working Paper 1: Living Environments

The mutual relationships between natural and built environments on the one hand, and health and wellbeing on the other, are increasingly seen to be critical to both the short- and long-term sustainability of the places where people live, and especially large cities and megacities. Under the broad heading of Living Environments, four more focused themes should be pursued as part of the Science for Health and Wellbeing initiative: 1) settlement density, interconnections and structures; 2) health incentives and disincentives for living in agglomerated settlements; 3) environmental and settlement dynamics; and 4) modern metropolitan culture. Many members of the ICSU family as well as cognate international organizations will find the topic and its themes of interest and will contribute to the production of publications of interest and value to the many constituencies holding stakes in large settlements.

Settlement Density, Interconnections, and Structures

Concentrated human settlements, especially toward the megacity end of the urban scale, depend upon intense interconnections with distant places in order to assemble the goods, services, people, and information upon which their sustenance and viability necessarily rely. Thus settlement structure both conditions and is conditioned by the technologies that move commodities, people, and information among and within them. Transportation technologies can be facilitators of as well as obstacles to health and wellbeing in human settlements, depending on how well they are managed. Accidents related to transportation are serious causes of injury and death among certain age groups, and the frequency of accidents resulting in injury or death in different kinds and sizes of settlements deserves investigation. These events and processes are integral parts of living environments. Poor design will augment their negative health effects. Good design can minimize harmful consequences, not only as regards transportation itself but also more generally; a facet of urban design that should be explored is the ways the physical layout of cities might be planned to provide residents with incentives and opportunities to exercise regularly as integral parts of their daily routines.

Communication and information technologies complement transportation systems in human settlements, acting as the nervous systems for these social organisms. New technologies enable individuals and small groups to bypass gatekeepers and middlemen who formerly controlled access to information, prices, *etc.*, thereby reducing the communications friction (and its associated costs) within and between settlements. New technologies and networks offer significant opportunities for identifying, monitoring, and managing many fundamental dimensions and individual facets of the complex relationships between urbanization and health and wellbeing. A focus on science-based approaches to minimizing environmental degradation by and within settlements using advanced information and communication technologies seems especially promising.

Health Incentives and Disincentives for Living in Large Agglomerations

Establishing the concept of *geodisease*—a dysfunctional, non-sustainable complex of human and natural systems evident at specific places would be a helpful conceptual and theoretical framework for applying science to health and wellbeing of human and not human life. Geodisease research would go beyond current practices in health risk mapping, identifying geographical and temporal variations in health and wellbeing indicators, and the search for environmental and anthropogenic causes to create taxonomies of geodisease and to seek commonalities and differences among occurrences of similar instances in different places. Specific elements of this approach might focus on the detection of disease clustering in relation to exposure to sources and agents (for example, relationships between land use and land cover on the one hand, and such diseases as trypanosomiasis; malaria; sleeping sickness; tsetse; and yellow fever on the other), modeling disease outbreaks and spread, and exploration of regional *medicometry* (the effects of medical infrastructure on health and wellbeing)

A point of increasing interest in the next decade will be the ways geodisease and medicometry combine to create incentives and disincentives for migration to and residence in large settlements. Although many aspects of high density living in large settlements are unhealthy, rural areas and small towns have their own inherent health and wellbeing disadvantages, and both the quantity and quality of medical care available in large settlements generally exceed that present at the smaller, less agglomerated end of the settlement scale. As populations age they become more attuned to the need for access to high quality medical care, and the aging of world's populations will constitute an additional incentive for migration to large agglomerations in the next several decades.

Environmental and Settlement Dynamics

Science and engineering have contributed greatly to the quality of life and to the health and wellbeing of large settlements in the last several centuries through the basic science and science-based infrastructure that provide unprecedented number of people living at unprecedented densities with clean water, sanitation, and reliable sources of cheap energy. Maintaining that infrastructure and supply and extending them where they are currently inadequate will present serious challenges as settlements continue to expand and intensify and as world populations continue to urbanize. Obtaining water and managing its use will become increasingly difficult in the next twenty years and beyond. Obtaining adequate energy will become more demanding as per capita energy consumption in the developing world increases. Mitigating pollution from energy generation and transportation should rank high among metropolitan scientific and engineering priorities. Constant monitoring and steady conservation efforts and innovation will be needed to ensure that urban living environments are well ventilated in order to impede respiratory diseases, well plumbed in order to avoid intestinal disorders, that solid waste is recycled in a sustainable manner, and that settlements are increasingly designed to better withstand such ineluctable hazards as earthquakes, fires, flooding, landslides, tsunamis, and volcanoes. In all these respects, urban design will enhance health and wellbeing more effectively to the degree that it is science based, drawing upon the experience of many large settlements in different parts of the world.

Modern Metropolitan Culture

Highly agglomerated living offers residents considerably greater freedom of choice in personal and small group behavior and mores than has historically been possible in smaller settlements. Many of the historically new freedoms cities offer seem to enhance health and wellbeing, but some seem to leave some individuals and groups adrift in unfamiliar settings. Science and technology might be more effectively employed on behalf of large settlements if more were known about the interplay of culture and settlements. Some possibilities that might profitably be pursued are the tensions between community and diversity among new migrants to large settlements, how trade and travel affect cultures and cultural values, and the health consequences of the globalization of food sources and supplies, with specific reference to the ways foodways change when people migrate to and settle in large urban agglomerations. Articulated food chains usually result in greater food diversity and more reliable supply than is characteristic of rural areas, but typically at higher cost and with the substitution of refined for whole foods. Altered and new ways of preparing food may also have beneficial or harmful consequences.

Players

Many members of the ICSU family of organizations and affiliates would find a focus on living environments an element of direct interest if included as part of an initiative on science for health and wellbeing, including, but not restricted to:

- ✍ IGU
- ✍ ISPRS
- ✍ IUAES
- ✍ IUBS
- ✍ IUFoST
- ✍ IUGG
- ✍ IUGS
- ✍ IUMS
- ✍ IUNS
- ✍ IUPAC
- ✍ IUPESM
- ✍ IUPS
- ✍ IUPsyS
- ✍ IUSS

Outputs

The working group on living environments suggested that the products of living environments research on science for health and wellbeing should consist of publications designed for and useful to educators at the secondary school and university levels, and of policy-focused and policy-relevant publications consisting of guidelines, standards, and recommendations. The identification of these outputs is not meant to preclude such other forms of dissemination of results as workshops, short courses, *etc.*, when and where appropriate.

Audiences

Consistent with the outputs noted above, the working group proposed that the results of living environments research be addressed specifically to: government agencies at various levels from local to international; legislators and regulators; professional groups, especially in health care specialties; educators; relevant private sector decision makers and researchers; town planners; and citizen and volunteer organizations.

Prepared by Ronald Abler (rabler@aag.org)

Working Paper 2: Water

Connections between water and health:

1. Pollutants: poisons and contaminants.
2. Waterborne disease: biological pollutants.
3. Food supply: indirect effect on health – nutrition, land degradation. Effect of both animals and crops
4. Balancing the use of water between agriculture, domestic, industrial - at larger scale feeds into conflict (internal and international).
5. Flooding – general well being, pollution, degradation of habitats, spread of disease; risk control prediction.
6. Desertification – nutrition.

Water management:

Local level: Watershed development – sources of pollutants, (natural and chemical), agriculture.

1. Collection of data (soils, geology, hydrology, vegetation (habitats), aquifers, actual per capita consumption (in local context) [ISPRS, IUSS, IUGG/IAHS]
2. Planning collection, storage and distribution of water – introduce health aspects into planning [IGU, IUNS, IUPAC, IUBS, IUGS, IUGG, IUMS, IUFoST, IUPESM]
3. Policy - pricing and economic control of water; planning of development, conservation.

Regional level: strategy for water use, flood control, geopolitical aspects.

National level: conflict, sharing water, strategic issues.

Influence of technology: desalinisation, cloud seeding, sanitation.

Outputs

Local requirements in a global context (global climate change, water cycle, consequences of not managing water can be catastrophic)
Data requirements
Factors to be considered
Implications for policy makers
Implications on environment
Risks (data deficiencies,

Audience

Science community, local users, resource planners, strategic planners, healthcare industry, educators.

Prepared by JoAnn Joselyn (jjoselyn@cires.colorado.edu) and Ian Dowman (idowman@ge.ucl.ac.uk)

Working Paper 3: The Impacts of Technology on Health and Wellbeing

1. Unions to be involved
IUPsyS, IBRO, IUPESM, IUPS. Others?

2. Topics and focus

How do technologies - mainly information technologies - impact human health and wellbeing? The topic will be focused on some specific issues, most of them related to brain and cognitive functions. First of all, we will consider those technologies which provide means for diagnosis and remediation. The first case to be considered is the set of technologies developed to investigate brain functioning. Neuroimaging is becoming a common tool in the study of cognitive processes, which necessitates deeper mutual knowledge between scientists developing models of the brain functions and scientists who design or refine modern neuroimaging tools (PET and fMRI).

Another set of techniques which are expanding are the Virtual Reality techniques, which provide a method for exposing patients to situations, for instance in desensitization procedures. Phobias, mainly social and spatial phobias, can be treated by using controlled immersion of patients in virtual environments (a technique that can be used in hospital contexts, but also at the patient's home). People with mild psychopathological disorders can benefit from these techniques which avoid direct exposure to situations that are quite difficult to reconstruct in hospital settings.

Virtual Reality must also be approached as a currently available product in our societies and an object for which some people develop intense interest, and even some forms of addiction. The consequence is loss of reality monitoring and tendency to mix up reality and imagination. By generating a strong feeling of presence, these techniques are a source of emotional disturbances that require more documented approach in order to prevent users of computer-based virtual environments from weakened sense of reality.

3. Outputs of collaboration

An inventory of the impact of information technologies on mental processes; a set of guidelines regarding the practice of technology-based therapies.

4. Audience for these outputs

Clinical community; researchers involved in clinical settings.

Prepared by Michel Denis (denis@limsi.fr)

Dear Marvalee,

In Relation to the Core Collaboration "The Impacts of Technology on Health and Well-being - The Functions of the Nervous system, Behaviour and New Technology", I would like to document an IUNS (and, I pres me, IUFoST) perspective on which I elaborated during our meeting in Paris 10-11th February 2003.

(1) The IUNS has relevant Task Forces

(a) Technologies and Nutrition

Current Chair: Professor Ruth Oniang'o (Kenya)

(b) Nutrition and Long Term Health

Chair: Dr Noel Solomons (Guatemala)

(2) The IUNS seeks a partnership with the Neuro-Behavioural Sciences.

(3) Areas of growing interest and importance are

(a) The environment and cortico-hypothalamic pathways to abdominal obesity with its attendant risk of diabetes and cardiovascular disease

(b) Food Technology and neuro-behavioural status - the food chain, food choice and behaviour

(c) Nutrition and mood (especially n-3 fatty acids and depression)

(d) Nutrition and cognitive function

Either through our Task Forces or some other mechanism, we (IUNS) could be involved in this collaboration.

Of course, the other 2 Collaborative Domains (Living Environment; Water and Health) are of equal interest to IUNS as documented elsewhere.

I shall alert IUNS Council and the Durban Congress (International Congress of Nutrition, 2005) organizers, Professor Pauline Kuzwayo and Professor Estes Vorster to the ICSU recommendation that Union Congress should have a Symposium or Workshop (perhaps a "Safari" workshop for the 2005 meeting) underpinned by the "Science for Health and Well-being" imprimatur. We are encouraged by the ICSU consciousness and support for African initiatives.

Yours sincerely,

Professor Mark L. Wahlqvist AO, FTSE
President, IUNS

Annex 6

Principles and Recommendations from the Science in the Information Society[1] workshop

Scientific research is one of the key factors underpinning the development of the Information Society. The fundamental technological components of the Information Society: electricity, radio waves, the World Wide Web (www) and the web browser were all first developed in academic laboratories. Ensuring equitable access to scientific knowledge is essential in order to achieve the Millennium goals and the use of Information and Communication technologies (ICTs) now offers incredible opportunities in this regard. Scientific research leads to the development of new technologies themselves and to the production of data and information that, when combined with these technologies, can be of huge benefit to society as a whole. The essential role of science and scientists in building the Information Society should be clearly acknowledged in the declaration of principles and reflected in the plan of action from WSIS.

Principles

Scientific knowledge and data are of enormous importance in a global Information Society:

- * To foster innovation and promote economic development
- * For efficient and transparent decision-making, particularly at the governmental level
- * For education and training

Scientific data and information should be as widely available and affordable as possible: the more people that are able to share them, the greater the positive effects and returns to society. Scientific knowledge is a public good.

The development of new ICTs opens up unprecedented opportunities **to ensure universal and equitable access to scientific data and information and to enhance the global knowledge pool. However, excessive privatization and commercialization of scientific data and information** is a serious threat to the realization of these opportunities for the benefit of society as a whole.

Agenda for Action :

1. Recognizing the critical role of universities and research institutions **in knowledge production and training, a global effort is necessary to ensure that these institutions in developing countries have affordable high-speed Internet connections.**
2. Promote sustainable capacity building **and education initiatives** to ensure that the new opportunities offered by ICTs for the production and sharing of scientific data and information can be realized in all countries.
3. Ensure that any legal regime on database protection guarantees full and open access to data created with public funding. **Restrictions on proprietary data** should also be designed so as to maximize availability for academic research and teaching purposes.
4. Provide long-term support for the systematic and efficient collection, preservation and provision of essential digital data, **e.g. population and meteorological data, in all countries.**
5. Promote interoperability principles and metadata standards **to facilitate cooperation and effective and efficient use of collected data and information.**
6. Promote electronic publishing, differential pricing schemes and appropriate open source initiatives **to make scientific information affordable and accessible on an equitable basis in all countries.**
7. Encourage initiatives to increase scientific literacy **and consumer awareness of how to select and interpret scientific information published on the world wide web, recognizing the key role of the media in communicating science.**
8. Support urgently needed research on :
 - the use of existing and novel information technologies in key areas, such as tele-medicine and education.
 - the socio-economic value of public-domain information and open access regimes
9. Recognize that there is an important role for science in developing and implementing the new governance mechanisms **that are necessary in the information society.**

1] This statement is the product of a workshop Science in the Information Society, that was organised by ICSU and the ICSU Committee on Data for Science and Technology (Codata) in partnership with UNESCO. The workshop took place in Paris on 12th March 2003 and involved over 60 scientists, science managers and representatives of international agencies from all over the world. A full report of the workshop and other ICSU activities related to WSIS can be found at www.icsu.org.

Annex 7

APPENDIX 1

Rights of Scientists and ICSU Statute 5

The rights sought by scientists (over and above the rights they hope to enjoy as individuals under broad International Human Rights legislation) are many and varied. They are expressed in such terms as “freedom of scientific association and communication”; “non-discrimination over engagement in international scientific activity”; “access to scientific data and information”; “freedom in the movement of scientific materials”.

These and other rights have all been the subject of ICSU General Assembly Resolutions over the years and are, in some measure, also encapsulated in the current Statute 5 and related ICSU literature.

We concluded that these rights could be expressed in two clearly-definable principles - those of Universality and of Freedom in the Pursuit of Science. The additional benefits of making this distinction was two-fold:

1. So defined each principle could be upheld in its own right and without any risk to the defence of the other
2. The balance of shared responsibilities - between ICSU itself, its Members, and individual scientists - was likely to differ significantly between the two principles; their separation is a logical step to their successful implementation.

Accordingly, we propose a redraft of ICSU Statute 5 to read:

“In pursuing its objectives, ICSU shall, in respect of rights and responsibilities of scientists:

- (a) itself observe and actively uphold the principle of Universality of Science - the freedom of scientists(1) as individuals to communicate and associate with other scientists, in the furtherance of their science, without discrimination on grounds other than scientific merits(2) through international scientific activity(3)
- (b) observe and uphold the right of scientists(1) to freely(4) pursue science in a manner which accords with the scientific process(5) and is undertaken responsibly(6)

This redraft must be read in conjunction with the following footnotes:

- (1) In the context of this Statute and these principles, scientists are persons advancing a field of knowledge within the compass of ICSU’s remit, who are of at least postgraduate status, acting in their personal and professional capacity in a responsible manner.
- (2) Examples of unacceptable grounds include exclusion by virtue of citizenship, religion, creed, political opinion, belief or persuasion, ethnic origin, race, colour language, age or gender.
- (3) A minimum of two individuals from different countries communicating and/or associating shall be deemed an international scientific activity.
- (4) In this context, “freely” means without let or hindrance from arbitrary interference contrary to internationally recognized human rights standards and free from commercial exploitation
- (5) Such pursuit includes undertaking research in accordance with the scientific method; communicating through various media; publishing in peer-reviewed journals, having access to data and information and exchanging data, information and materials.
- (6) “responsible” means both in accordance with the norms and codes of behaviour of the scientific community in respect of the practice of science and in a manner consistent with society’s expectations of science as an activity to the benefit of humanity.

[Our Final Report will include a discussion of what such expressions as “freely” do not mean and why such “proving of negatives” is not, and should not be, attempted in the definitions given here]

We believe these notes should be set out separately in this way. Their attempted inclusion within the Statute would greatly complicate the definitions of the Principles and lead to ambiguities of the kind that have been pointed out to us in the current Statute 5.

APPENDIX 2

Shared responsibilities

The embedding of science in society is increasingly complex. The potential for the misuse of science is more varied and, arguably, greater than at any time in the past. Political conflict across the globe alas continues apace, stimulating a growing desire for intervention where human rights are grossly abused. In this situation, constraints on scientific activity, and attacks on the rights of scientists seem likely to grow. Moreover, they will be at least as likely now to emanate from institutions and individuals seeking political expression as from governments on grounds of national security or internationally approved boycotts.

Accordingly, the defence of the Universality and Freedom in the Pursuit of Science Principles must become both stronger and more diverse. Both imply a substantial increase and broadening of responsibility. For the future good of science and its continuing prosperity we shall need not only to clarify the definition of those Principles and to strengthen our monitoring and policing of actual or potential breaches, but also strengthen our resolve and capacity to tackle such breaches, case by case. This cannot be adequately achieved without the active involvement of the scientific community worldwide and at all levels from the international to the individual.

The Group concludes that within ICSU we shall need a mutually supportive partnership approach, with initial executive action taken at the most appropriate level by the most appropriate body - in short, attention to the merits of the “subsidiarity principle”.

[Defined in the Oxford English Dictionary as “the principle that a central authority should have a subsidiary function, performing only those tasks which cannot be performed effectively at a more immediate or local level”]

Universality Principle

We currently envisage that the future role of ICSU itself (at Executive Board and Directorate level, and through such committee structures as it may adopt), will be to:-

- (a) Focus its executive action on international scientific activity sponsored by the ICSU family in partnership with Member bodies, to undertake the following tasks:
 - (i) monitoring, documenting and responding to individual cases of potential/actual breaches of the Universality Principle, and providing a central point of reference for the receipt and provision of information
 - (ii) promoting debate among Members, through virtual or actual conferences, including ICSU General Assemblies, about how best to raise awareness of the Universality Principle both within and outside the scientific community
- (b) Work with National and Union Members and Associates and with other interested parties within or outside science to foster external debate on how best to secure wide continued agreement to the Principles of Universality and Freedom in the Pursuit of Science.

The Review Group has initially concluded that, as parties to Statute 5, the

National Scientific Members of ICSU should be invited to:-

- (a) openly [publicly] adopt as an institutional goal the upholding of the Universality Principle;
- (b) raise awareness, amongst scientists, scientific institutions [and all society's stakeholders in science] in their country, of the nature and importance of the Universality Principle to the future of science and foster debate on how best to secure its continued adoption
- (c) bring possible breaches of the Universality Principle to the prompt attention of the relevant organization(s) and seek explanations of the potential or actual breach
- (d) take ameliorative action, with or without others, e.g the relevant Scientific Union Member or Associate and or with ICSU centrally
- (e) ensure they have an adequate capacity, in human and financial resources to pursue all the above.

Our initial view is that Scientific Union Members should be invited to:

- (i) advertise their active loyalty to the Universality Principle and their part in upholding it
- (ii) keep abreast, through organizing scientific meetings, programmes, projects, etc., of potential and actual breaches of the Principle
- (iii) utilize such meetings, etc., to;
 - (a) raise the profile of the Principle - its nature and importance - amongst all scientists attending and thereby also raise its profile among their own members
 - (b) foster debate and discussion with a view to enhancing efforts to maintain universality
- (iv) receive input on breaches of the Principle from National Scientific Members and/or Associates of ICSU
- (v) bring any breaches, actual or potential, affecting ICSU family sponsored meetings to the immediate attention of ICSU and work with ICSU to bring about a solution to individual cases [along the lines currently set out in the "Blue Book", pp 7-8]
- (vi) bring to the attention of National Scientific Members and/or to other relevant scientific institutions [able to help pursue a specific case] any other breaches in respect of other meetings, or other activities in their discipline

The Group concluded that as members of the ICSU family, Associates would be invited to provide a comparable commitment, and hence contribution, to upholding the Universality Principle, to that invited of Members and set out in the specific proposals listed above.

Freedom in the Pursuit of Science Principle

Breaches of the Universality Principle involve discrimination against individual scientists in engaging in international scientific activity. Cases are logically, and from experience, best dealt with at an international level, albeit with a substantial and, in future, growing contribution by the relevant National Member (and, often, a Scientific Member also).

Issues surrounding Freedom in the Pursuit of Science will, in contrast, in most cases, arise initially within national boundaries, by reason of decisions over public policy, national security, commercial competitiveness, etc. Accordingly, it will generally be logical and appropriate for a successful defence of this Principle to begin "at home", with initial steps taken by the science Academy, premier Research Council or, in their absence, by an alternative senior scientific body, with ICSU kept informed, where possible, by a National Member. However, there will be cases where no strong national scientific organization exists, or where the political process has severely curtailed or even eliminated its ability to act. In these situations, it will fall to ICSU to raise the matter both with UNESCO (where a *prima facie* breach of human rights legislation exists) and with national government(s) in support of, or instead of a National Member's intervention. Either way, the balance of action is likely to move over time in resolving a given problem and the necessary resources, machinery and communication will need to be maintained at all times by both partners - ICSU and its Member.

[Against that rationale, the Group, at its next meeting, will consider the future role of National Scientific Members in respect of the Principle of Freedom in the Pursuit of Science and the nature of any parallel role for Union Members]

APPENDIX 3

Responsibilities of Individual Scientists

Appendix 2 sets out the Review Group's initial conclusions on the future roles which we envisage for organizations in membership of ICSU in upholding the Principle of Universality. (At our next meeting we shall discuss Members' roles in support of the Principle of Freedom in the Pursuit of Science). Here we consider the role of the individual scientist. In doing so, we recognize the inherent ethical dilemma that might face an individual in being scientist, citizen (national and global) and human being with a personal conscience. Nevertheless, we believe the right to practice science implies unavoidable, added responsibilities on the individual scientist specifically in respect of those Principles. And it is against that background that we present the following initial recommendations on what those responsibilities should be.

1. Be aware of the Principles and behave in accordance with them
2. Underpin acceptance of the Principles by those outside science by undertaking science in a responsible manner - *i.e.* in accordance with codes of conduct set out by sectoral/discipline bodies, professional and learned institutions and/or employers.
3. Recognize that whilst a right freely to associate is not an obligation on another to respond, any rejection of such a request must be non-discriminatory and made only on scientific merit and the norms of the scientific process.
4. Recognize that the right to expect to be able freely to pursue science and to communicate and associate with others internationally brings with it a responsibility, additional to and potentially at odds with, the responsibility of a citizen. But that in the last resort individuals should not be barred from acting in response to their consciences.
5. Appreciate that the Principles upheld by ICSU are based on the nature of the scientific process - the exchange of ideas, information, materials, etc. - and that individual scientists should accordingly accept that a *prima facie* case exists for sharing and for fully participating in those flows.
6. Understand the difference between a boycott and a sanction (see *Footnote*).
7. Accept that adoption of the Universality Principle is an integral part of any set of guidelines for good practice in science and to act accordingly, in deciding, for example, on whether to attend an international meeting which breaches the Principle and on what action to take if attending such a meeting.
8. Accept and actively uphold any rules of membership of an Academy, Learned Society or other scientific body which refer to the obligation to observe the Universality Principle and the Principle of Freedom in the Pursuit of Science.

Footnote: Webster's Dictionary defines "boycott" as to: "abstain from dealing with as a means of protest" This is not what ICSU does nor encourages. Rather it fosters contact and discussion. The ICSU approach is that of the "sanction", defined by Webster as: "a penalty to enforce compliance". It is important that the distinction between "boycott" and "sanction" is understood.

APPENDIX 4

SOME KEY QUESTIONS

NB Please reply to Questions 1-5, 6(i), (ii), 7, 8 and 9(i), (ii) by underlining, italicizing, emboldening or colouring YES or NO and returning Appendix 4 to ICSU (secretariat@icsu.org) in Paris. Where appropriate, brief responses to Questions 1(a), 3(a), 4(a), 5(a), 8(a) and 9(a) would be most welcome. **BUT PLEASE DO NOT DELAY YOUR REPLY TO QUESTIONS 1-9, WHICH SHOULD REACH ICSU BY 14 JULY 2003. THANK YOU.**

General

1. Do you agree that the rights that scientists currently enjoy will come under increasing attack?

YES/NO

- (a) If not, please briefly outline your view of the situation.
2. Do you support the argument that a stronger and broader defence of scientists' rights is needed? YES/NO
3. Would you support a future defence of those rights that was based on a shared responsibility - ICSU itself, its Members and individual scientists? YES/NO
- (a) If not, indicate briefly your view please on how ICSU should in future aim to discharge its responsibilities adequately.

Rights

4. Does the redrafted Stature 5 (plus footnotes) encapsulate the rights of scientists that ICSU should defend? YES/NO
- (a) If not, what elements are missing?
5. Do you concur in a formulation based on two Principles? YES/NO
- (a) If not, would you like to specify an alternative formulation?

Responsibilities

6. Is the future role envisaged for ICSU itself: (i) Appropriate? YES/NO
(ii) Too broad? YES/NO
(iii) Too narrow? YES/NO
7. Would any of the proposed responsibilities for Members of ICSU give your organization difficulty, in principle? YES/NO
8. Would the proposed responsibilities for Members create a problem for you as regards resources available to you (either money or manpower)? YES/NO
(a) If yes, would you care to specify?
9. Do you believe that:
(i) individual members of your organization YES/NO
and (ii) the scientific community your organization represents YES/NO
would accept the proposed responsibilities of individual scientists?
(a) If not, in either case, please specify unacceptable responsibilities.

Terms of Reference for the ICSU Priority Area Assessment on Capacity Building in Science¹

1. Introduction

The goal of the Priority Area Assessments (PAA) process is to strengthen ICSU's overall capability in addressing priority scientific issues that are of emerging importance to science and society at large. The PAA is a mechanism to develop ICSU's strategies for selected priority scientific areas. It is designed to help ICSU develop a programme structure reflecting its priorities; to ensure synergies in the activities of the ICSU family; and to enable an appropriate allocation of limited resources. In order to be effective, the PAA process must involve relevant members of the ICSU family – i.e. Union and National Members, interdisciplinary bodies, and joint initiatives. It should also consider ICSU's priorities in the context of relevant activities outside of ICSU.

The immediate outcome of a PAA is a report containing key recommendations that will be published and widely disseminated by ICSU. This report will form the basis for future actions by ICSU and ICSU members, including the development of new programmes, policy initiatives and definition of new priorities for the ICSU grants programme. Some of the recommendations may require the establishments of new partnerships with bodies outside the ICSU family or may be more appropriately taken forward by other organisations, in which case, the necessary dialogue(s) will be initiated. The results of the PAA will provide essential input for the development of an ICSU strategy to be presented at the 28th General Assembly in October 2005.

2. Context for the PAA on Capacity Building in Science

Scientific and technological capacity of individuals is increasingly called for as a basis of prudent private and public decision-making for our sustainable future. Abilities to create, synthesise and apply scientific and technological knowledge are crucial for peaceful development of the global society in the 21st century. However, securing high-quality human resources with strong scientific and technological talent is one of the major challenges to all societies of the world. Attracting young talent to science, improving the quality of science education, and enhancing public understanding of science are among others emerging priority issues of government of both developing and developed countries. In particular, there is a pressing need for capacity building in developing countries where poor education in general is an inexorable problem. However, the decreased attraction of science and engineering careers of youth in industrialised countries is also cause for concern.

Capacity building in science does not only mean training of people, but also has institutional and other implications. It should also concern not only scientists or scientists to be but also other groups of individuals in the society. Capacity building in science should be the continuous efforts that lead to the establishment of a corps of qualified scientists with supporting infrastructure including facilities and working conditions that enables them to conduct research, education, training and advisory work, particularly, in area of direct societal significance².

The responsibility for building and maintaining capacity lies squarely on the shoulders of national governments but requires significantly enhanced collaboration and partnerships with the private sector, the global development assistance community and the S&T community. The United Nations, together

¹ Other PAAs are also being initiated in the area of "Environment in Relation to Sustainable Development" and "Scientific Data and Information"

² Working definition of "Capacity Building" developed by the ICSU Advisory Group on the Possible Role of ICSU in the Areas of Capacity Building in Science and of Science Education in 1992. The group was called partially as a follow-up to UNCED. Based on the recommendation of the group, the 24th General Assembly in 1993 established the Committee on Capacity Building in Science (CCBS) replacing the Committee on Teaching of Science.

with their partner organisations, has been advocating the collective responsibility of the global society for capacity building for sustainable development. In the occasion of the World Summit on Sustainable Development (WSSD), ICSU, representing the International Scientific and Technological Community together with other partners, has successfully highlighted the importance of capacity building in science for sustainable development.³ At CSD11, discussing the follow-up to WSSD, ICSU was successful in promoting 'education' as a cross cutting theme and giving recognition to this group equal to the official major groups, of which the Science and Technology Community is one. ICSU, having the strengthening of human and physical scientific resources worldwide with particular emphasis on the developing world as one of its major objectives, is expected to continue playing a leading role in this area, in partnership with other international, regional and national organisations.

Amongst many inter-governmental organisations, UNESCO will continue to be a major partner of ICSU in the area of capacity building in science. For example, the UNESCO Science Sector is initiating a brain-storming debate on strategies for strengthening international co-operation in basic science involving ICSU. The Education Sector organised the Higher Education Partners' Meeting (WCHE +5) in June 2003 to review the progress and follow-up strategies to the World Conference on Higher Education (WCHE). WCHE+5 concluded that science and higher education policies must be integrated focussing on the role of universities both for higher education and scientific research. Such collaboration will be extremely useful in defining ICSU's role in the capacity building in science in a broader context.

The InterAcademy Council has initiated a project designed to produce a global strategy for improved access by all nations and peoples to the benefits of science and technology. The focus will be on human resources, research institutions, scientific cooperation and global communication. The final report will be issued to a wider audience including international organisations, in particular, appropriate UN agencies. A draft report will be made available for consultation in September 2003, which would serve as a part of background for this assessment.

Recognising the importance of capacity building in science and the role of ICSU therein, the 27th General Assembly (GA) of ICSU encouraged the ICSU family members to intensify their efforts in effecting partnerships within and beyond the ICSU family to strengthen capacity building, especially for developing countries, and to broaden outreach to teachers and young scientists. In this connection, the GA also decided to continue the mandate of the Committee on Capacity Building in Science (CCBS) only for one year. The GA also decided to dissolve the Committee on Science and Technology in Developing Countries (COSTED), and to set up a Policy Committee on Developing Countries and four ICSU Regional Offices for developing countries. The PAA on Capacity Building in Science is expected to develop strategies for bringing synergies to a wide range of capacity building activities of the ICSU family, and provide inputs to future discussions on the future course of the CCBS.

3. Scope of the PAA on Capacity Building

The scope of the PAA should cover a wide range of capacity building activities carried out by the ICSU Unions and National Members and Interdisciplinary Bodies, to provide an overall picture of those activities and propose action to strengthen synergies among them. The PAA should also take into account relevant efforts made by outside organisations and identify value-added role of ICSU and ways to develop partnership with other organisations, not only in the science sector but also other sectors such as education and development aids sectors, to complement each other.

³ ICSU 2002. ICSU Series on Science for Sustainable Development No.5: Science Education and Capacity Building for Sustainable Development.

4. Major ICSU Activities in relation to Capacity Building

A one-day special session was held on the occasion of Unions Presidents Meeting in February 2001, inviting representatives of the ICSU Interdisciplinary Bodies, to exchange information on their major capacity building activities. As illustrated later also by a draft compendium on capacity building⁴, a wide range of capacity building activities are being carried out by the ICSU family – ICSU Unions Members, National Members, and Interdisciplinary Bodies. In particular, many of the Scientific Unions are actively engaged in a wide variety of educational activities in respective disciplines. Following are the only selected examples of capacity building activities of the ICSU family.

The Committee on Capacity Building in Science (CCBS) was created in 1993 with the mandate covering the following three areas: i) primary school education in science and mathematics, ii) the public understanding of science, and iii) the isolation of scientists. Over the past few years, CCBS has been focused on science and mathematics education at the primary, secondary, and tertiary levels mainly through the organisation of international conferences to exchange best practices on curriculum development, hands-on science education programmes and other ways to ensure quality of science and mathematics education. These conferences contributed to connecting the science and education communities, in particular, in the host country of the conference. For example, the CCBS Conference held in China in 2000 has also served as an opportunity to launch reform efforts in primary school efforts in primary science. In addition, the CCBS, in association with IAP, is developing a functional website linking relevant homepages of organisations/programmes. The 27th GA decided to continue the mandate of CCBS only for one year (till the end of 2003).

The Committee on Science and Technology in Developing Countries (COSTED) was established in 1966 and for over decades has carried out a range of projects to facilitate participation of developing countries' scientists and to strengthen the scientific and technological capacity of developing countries through the work of its Central Secretariat in India and seven regional secretariats. An in-depth review of COSTED was carried out in 2001-2002 and based on recommendation from this review, the 27th GA decided to replace the seven regional secretariats by four ICSU Regional Offices in Asia, Africa, Latin America and Caribbean, and Arab Region.

ICSU/TWAS/UNESCO Short-Term Fellowship Programme in the Basic Science, originated in 1990, aims at promoting capacity-building through international cooperation in the basic sciences. Specifically it is enabling scientists, particularly young scientists, from developing countries and Central and Eastern Europe, to carry out short-term studies in well-established scientific centres. The ICSU Executive Board recently reviewed the programmes and suggested that they should focus more on the least developed countries. ICSU's longer-term role in this programme should be considered in the context of the PAA.

Global Change SysTem for Analysis, Research and Training (START), is a programme of the Earth System Science Partnership (ESSP), established in 1992, developed a system of regional networks of collaborating scientists and institutions on global change issues. Its objective is to build indigenous capacity, especially in developing countries, to address scientific and policy aspects of global change by strengthening and connecting existing institutions, training scientists and providing them with improved access to data and research results.

International Network for the Availability of Scientific Publications (INASP), a programme of the Committee on Dissemination of Scientific Information (CDSI), was established in 1992 in cooperation with UNESCO and TWAS. It is a cooperative network of partners whose aim is to enhance worldwide access to scientific information, and to improve its flow within between countries, especially those with less developed systems of publication and dissemination. There are many other ICSU subsidiary bodies that have capacity building activities focusing on research capacity building in specific areas in developing countries.

⁴ ICSU. 2001. ICSU Compendium of Capacity Building Activities (draft)

5. Terms of Reference

The Panel will:

- 1) Define an overarching "mission" and the role of ICSU in the area of the Capacity Building taking into account relevant activities outside of ICSU;
- 2) Propose a strategic framework for ICSU to take this area forward for the next 5-10 years;
- 3) Examine current activities within the ICSU family, identify gaps, overlaps and synergies among existing activities and possibly propose new responsibilities for individual bodies;
- 4) Propose modalities for promoting collaboration and co-ordination within the ICSU family when necessary and propose potential partnerships with bodies outside ICSU;
- 5) Examine and propose, if appropriate, changes either in the future direction of individual bodies and/or their activities, including relationships with other bodies/organisations.
- 6) Review the activities of the ICSU Scientific Unions and propose, if necessary, ways to strengthen interaction among themselves and also with interdisciplinary bodies and joint initiatives.

6. Work plan

A minimum of two physical meetings of the Panel might be expected in addition to “virtual” discussions via e-mail and telephone. Input from the relevant members of the ICSU family will need to be solicited and analysed; it may be desirable to conduct ‘face to face’ interviews with representatives of key bodies.

The Panel will be asked to prepare a report to the ICSU Committee on Scientific Planning and Review (CSPR), which will include an overarching mission statement and strategic framework for ICSU and recommendations on roles of new and/or existing interdisciplinary bodies and joint initiatives in the area. This report will be published.

7. Resources

ICSU will provide financial resources to carry out the review, including travel and accommodation costs for the Panel members to participate in the necessary meetings. The ICSU Secretariat will provide administrative support to the Panel, including assistance with communication among the members and organisations of meetings. The final report will be the responsibility of the Panel, although the ICSU secretariat will assist in its preparation as necessary.

NOMINATION FOR AD HOC 'EXPERT PANEL'

PRIORITY AREA ASSESSMENT CAPACITY BUILDING IN SCIENCE

Please complete this form and send it electronically to: rohini@icsu.org with the following subject headings: "NOMINATION FOR AD HOC EXPERT PANEL FOR CAPACITY BUILDING IN SCIENCE"

Both pages must be completed.

DETAILS OF CANDIDATE NOMINATED

Title:

First Name:

Last Name:

Year of Birth:

Gender:

Address:

Country:

Nationality:

Email Address:

Phone :

Fax:

Submitted by :

Title:

First Name:

Last Name:

Organization:

Date of Submission:

PROFILE OF NOMINEE

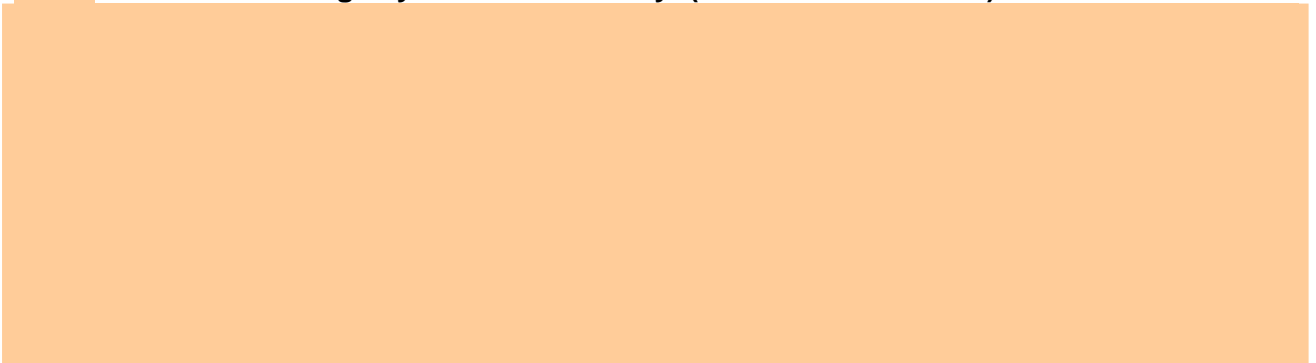
Name of Nominee:



Academic background: (maximum of 10 lines)



Positions held including any in the ICSU family: (maximum of 10 lines)



Expertise: (maximum of 10 keywords / phrases)



Why is this individual particularly suited to this committee? (maximum of 10 lines)

