

# REPORT OF THE COMMITTEE ON CHEMISTRY EDUCATION

2003–2004

## INTRODUCTION

This section describes the decisions that have been taken in the course of the year and provides a background to the section on the fulfilment of IUPAC's goals

**1. Strategy meeting** A meeting of the Chairman and the chairmen of the two subcommittees of the CCE, in the presence of Fabienne Meyers, was held in Oxford in January 2004 with a view to mapping out strategy. It is intended that a meeting of this kind will be a regular component of CCE's calendar, with membership evolving as topics of discussion are identified.

The meeting decided that the Symposia held at the Ottawa meeting of the CCE should be continued, with each component (PUC and CED) to consider what additional value, as a part of IUPAC, it could bring. The terms of reference of the PUC and CED subcommittees were set out as follows:

**(a) PUC** Overall: to encourage the public appreciation of chemistry. Within this general context, specifically:

- Regionalization, with particular reference to the cultural milieu
- Assessment of the success of programs reaching out to the public
- Initiation, encouragement, and implementation of programs
- The encouragement of partnerships
- The transfer of successful practice

**(b) CED** Overall, to encourage good practice in chemical education worldwide. Within this general context, specifically:

- Coordinate modes and levels of assessment
- Assist in curriculum development
- Focus on standardization and the benchmarking of standards
- Acknowledge the importance of regionalization by drawing on local knowledge and practice and bringing together people across boundaries

A third activity that we need to develop is to propagate the educational aspects of Divisional activities.

The meeting also resolved that the **duties of the Project Coordinator** should be expanded as follows:

(1) To remind the Project leader to provide brief interim reports in May and

November for consideration at the following CCE meeting

(2) To provide a Completion Certificate based on a template to be developed by the Project Coordinator, which is to be completed by the Project leader; the template will include:

- Statement of original objectives
- Statement of the achievements of the Project (and any variation from the original perception)
- A few informative paragraphs suitable for publication in *CI*
- Statement of expenditure, distinguishing CCE funds from others
- Contact information for future developments

The meeting considered how to deal with the **Project Budget** that it had been awarded for the biennium, for the first time. It decided that the pattern of deployment should be as follows:

There should be an initial float for a Project, with a second tranche provided subject to satisfactory progress

The Project Committee would probably expect to look at applications in excess of USD10k

The Project Coordinator should recommend the level of funding subject to:

- Overall biennium funding is USD20k
- Annual first-year drawdown should not exceed USD10k
- Initial half-annual drawdown should not exceed USD5k
- Sequential grants should be considered (eg, 3+2) to enable progress to be monitored

A variety of constraints on procedure in case of personal involvement were put in place.

**(2) Off-year meeting** The 2004 off-year meeting of the CCE in the course of the 18<sup>th</sup> ICCE in Istanbul, 3–8 August. This meeting provided an excellent opportunity to review progress and to initiate new practices and projects.

The primary focus of the **PUC Subcommittee** has been on two activities. One is the *It's a chemical world* poster competition in partnership with Science Across the World. The outcomes were disseminated widely in *CI*, *Canadian Chemical News*, the Korean *Chemical Education Journal*, and the IUPAC website. The second principal activity has been under the general rubric *The flow of ideas* (through chemistry) and the three symposia held under that umbrella at the joint IUPAC Congress/Canadian Society of Chemistry Conference in Ottawa.

New activities planned for this year include the project 'Young Ambassadors for Chemistry' in partnership with Science Across the World. This project has been approved, and additional funding has been won from GSK, the British Council, and other sources, with a view to running the program in Taiwan in November 2004. Plans are in process to extend the project to Argentina, Russia and the Balkans, and

South Africa. A major effort is being applied to assist in the planning of the PUC contribution to the 19<sup>th</sup> ICCE (Seoul, 2006), which will have several PUC sessions. Preliminary steps have been taken to prepare a major Project on the best global practices in PUC with a view to identifying the best niche for IUPAC. The subcommittee is also committed to clarifying the relative roles of CEI and CI with respect to publishing material related to PUC.

The primary focus of the **CED Subcommittee** has also been on two activities, on Small-scale equipment and in Low-cost equipment. It is now planning to extend its range of operations to establish international standards for testing, particularly in highschools. It is now intending to extend the range of its activities considerably, including looking for ways of establishing procedures for providing support and advice for countries intent upon improving their provision of education in chemistry.

The CCE has been asked to consider what contribution it can make to education in relation to **chemical weapons**. An opportunity has been identified for collaborating with OPCW and other bodies, and a small group has been set up to consider the best way forward with this sensitive and delicate matter. It is also considering the general principles that might relate to the benchmarking of a variety of degrees internationally and looking for ways in which it can collaborate with FECS, not only in seeking to avoid clashes of educational conferences (such as the one that caused considerable concern this year). The CCE also noted that we are embarking on what the UN has designated the *Decade of Sustainable Development*, and hopes to identify funding and collaborative opportunities.

A long-standing concern has been the efficacy of **DIDAC**, for which the CCE has assumed overall responsibility (*vide* the COCI Chairman's report). A considerable investment has been centred on this production and UNESCO has been generously involved in its dissemination. The CCE has been concerned for some time that the material (both the original transparencies, a set of which weigh 20 kg [i.e. 200 N], and the freely and widely distributed CD) has reached the appropriate end-users. To that end, CCE is considering establishing a Users' Network to encourage innovative uses and to establish that the appropriate members of the world community have access to the material.

One of the jewels in the crown of the CTC and CCE activities has been the widespread dissemination through workshops of **microscale** kits and their use for education. In response to a request from John Bradley and Alex Pokrovsky, the CCE has agreed to establish an IUPAC/IOCD *ad hoc* group to take these techniques further, reporting to the CCE.

Another jewel in the crown of the CCE is the **International Conference on Chemical Education** (ICCE) held biennially. The 18<sup>th</sup> has just concluded in Istanbul, with close to 400 participants. A major aspect of ICCEs has been their ability to attract participants from the region, and the Istanbul ICCE was notable for the number of participants from the Balkans and the Middle East. To establish a smooth flow and equitable flow of these important meetings, the CCE has established a procedure for applications. Indeed, previously there was little point in doing so as so few countries expressed interest, but there is now a considerable queue.

The CCE has given some thought to its own **organizational structure** within its formal IUPAC structure, which currently consists of

Chairman  
Chairmen of PUC and CED Subcommittees  
Secretary  
Project Coordinator

It is proposed to add to this organization three further offices:

Treasurer [principally to monitor Project Budget]  
Divisional Liaison Officer [to maintain relations with Divisions on mutually interesting projects]  
Conference Officer [to monitor conferences in related fields and to oversee the sequence of ICCEs]

For instance, the Conference Officer is to draw up criteria for selecting ICCE sites and will monitor potential clashes.

## **FULFILMENT OF IUPAC'S GOALS**

As usual, we are asked to explore the extent to which our committee is fulfilling IUPAC's goals. Here follows a brief commentary which should be read in the light of the preceding *Introduction*, which provides supporting details:

*(A) IUPAC will provide leadership as a worldwide scientific organization that objectively addresses global issues involving the chemical sciences.*

CCE is establishing procedures of best practice in chemical education that suit the regions and exploring how cultural differences may affect the public understanding of science.

*(B) IUPAC will facilitate the advancement of research in the chemical science through the tools that it provides for international standardization and scientific discussion.*

CCE is involved in standardization of testing, in benchmarking, and the regionalization of curricula; the ICCE programme is a well-established and respected vehicle for scientific discussion, and the involvement of CCE with *CI* and *CIE* ensures that discussion is widespread.

*(C) IUPAC will assist chemistry-related industry in its contribution to sustainable development, wealth creation, and improvement of the quality of life.*

CCE identifies sustainable development as one of its major concerns, and perceives its role in propagating education as contributing to wealth creation and the improvement of the quality of life.

*(D) IUPAC will foster communication among individual chemists and scientific*

*organization, with special emphasis on the needs of developing countries.*

CCE has an intrinsic but balanced involvement with developing countries, as is reflected in its principal projects.

*(E) IUPAC will utilize its global perspective and network to contribute to the enhancement of chemistry education, the career development of young chemical scientists, and the public appreciation of chemistry.*

These are core activities of the CCE which pervades its entire programme.

*(F) IUPAC will broaden its national membership base and will seek the maximum feasible diversity in membership of IUPAC bodies in terms of geography, gender, and age.*

The ICCE programme provides an ideal opportunity to propagate IUPAC, and the members of CCE reach deep into the various structures in their regions and countries.

## **MAJOR CHALLENGES**

We are also asked, this year, to comment on the challenges facing us. The principal challenge is the sustenance of the influx of young people into chemistry. The CCE is doing its best to encourage good practice in education, which is one component of rendering chemistry attractive, and also to encourage the public appreciation of chemistry, which is another essential approach. It (the CCE) therefore regrets that the UK resolution accepted by Council in Ottawa has been so aggressively diluted.

P. W. Atkins  
Chairman, CCE  
August 2004