Over the course of the past year, there has been substantial interest and activity within IUPAC surrounding the issue of chemistry education. The year 2002 began with the creation of the Committee on Chemistry Education (CCE) and in August the IUPAC-sponsored 17th International Conference on Chemical Education was held in Beijing. This main article describes how the revamped and reinvigorated CCE will be structured, its goals, and guidelines for projects. One accompanying article describes the role of the new CCE Subcommittee on the Public Understanding of Chemistry, a second gives an account of the recent inter-union workshop on science education—a project recently undertaken by CCE—while a third article reports on the successful Beijing conference.

In 1999, at the IUPAC General Assembly in Berlin, then–IUPAC president Joshua Jortner took it upon himself to stir up IUPAC's educational activities. He organized an ad hoc committee to take a fresh look at IUPAC's position on chemical education issues. As a result, the Committee on Chemistry Education (CCE) was established in January 2002, with Peter Atkins as chairman. The CCE superseded the former Committee on Teaching of Chemistry (CTC). Having been in place for a year now, *CI* asked the chairman to tell us where this new committee is heading and how it functions.

CCE will contribute to the worldwide propagation and appreciation of chemistry.

by Peter Atkins

The Committee on Chemistry Education (CCE) had a first strategic meeting in March 2002, at which a small group of us had set out to establish the newly formed committee's general objectives. Later in August, our proposals were ratified by the full committee at its meeting held during the 17th International Conference on Chemical Education in Beijing.*

* See Conference report on page 9.

The Structure and Aims of the Committee

First, the committee is huge: There are currently nearly three dozen members. It is composed of eight Titular Members, eight Associate Members (all of whom are representatives of the Divisions), and around two dozen National Representatives from all over (well, nearly all over) the world. The number is so large (and growing . . . hence the slightly vague statistics) because there is no restriction on membership and our responsibility is so widely embracing. We are, of course, very pleased that there is such substantial interest.

To make the committee manageable, and to take some pressure off the chairman, we have created two primary subcommittees and a project advisory group.

The *Subcommittee for Chemistry Education Development (CED)*, under the secure chairmanship of John Bradley, is concerned with chemical education in the developing world. John is widely experienced in this area, particularly through his work on the dissemination of microscale techniques. In addition, he provides invaluable continuity for the CCE, having served as chairman of the CTC, the CCE's predecessor.

The *Subcommittee on the Public Understanding of Chemistry (PUC)* is chaired by Peter Mahaffy. Its duty is clear from its name, and Peter is currently coming to grips with the panoply of national approaches to this important area; *see Peter's report hereafter*. A vital source of information for the subcommittee is the Committee on Chemical Industry (COCI), with which—I am pleased to say—we are strengthening our links. A representative of COCI is on CCE and a small liaison committee of COCI members has been charged with determining issues for CCE to pursue.

Our *Project Advisory Group* is built around Elisa Pestana, our secretary, who is also our project coordinator. The project program (see below) absorbs a great deal of effort and time, and to help Elisa we have set up a small group (Bob Bucat, Ram Lamba, and Tony Ashmore) to facilitate the flow of projects through the system and to ensure that referees' reports are collected and interpreted fairly.

Finally, we feel that good communications with COCI and CHEMRAWN are absolutely essential to the furthering of our goals; the former largely because the

chemical industry desperately needs well-educated chemists and a supportive public, and the latter largely because of the crucial contribution to sustainable development that chemistry can make. I am in the process of establishing helpful relations with CHEMRAWN and will report on that later.

The Projects

Our concentrating on relations with the other operational committees does not mean that we are unaware of the wonderful intellectual resource represented by the Divisions. They already have representatives on CCE (in the form of our eight Associate Members), so the problem of communication is less acute. Nevertheless, we need to ensure that there is a good flow of information and ideas, perhaps in the form of joint projects, into CCE. That process should be continuous, but I shall try to visit all the Division Committees at the General Assembly in Ottawa, provided the timetable and the respective president allows it, and look for ways of extending our fruitful collaboration. The Divisions are tremendous scientific and human resources, and I hope that they will see the CCE as an attractive conduit for their pedagogical ideas.

The CCE must also be the generator and encourager of its own ideas, and I hope that we will soon have a vigorous program of activity emerging from our own members, as well as projects entering the system from outside. At the Beijing meeting we laid down guidelines—they are no more than that—for the types of projects that we would like to encourage. All of them fall broadly under the heading "the flow of ideas," including the flow of ideas within the subject, from instructor to student (at all levels of education), and from the chemical community into the public arena.

We need to ensure that there is a good flow of information and ideas.

We are also paying special attention to the encouragement of ideas that relate to the different regions and subregions of the world. Whereas in general the guidelines for projects within IUPAC specifically discourage regionalization for scientific projects, that constraint has less force for educational projects, for they must acknowledge the resources and aspirations of regions. However, although projects may emphasize regionality, hopefully those that have emerged in one region will be exportable in some respects into others, perhaps to the extent of providing a template for future activity. Examples for such projects include establishing a course curriculum in Latin America, or setting up a clearinghouse for the flow of pedagogical ideas into and out of Russia and the Commonwealth of Independent States. The feasibility of the first project is being explored. The latter project still needs more detailed formulation, but the CCE thinks the idea is excellent and is looking for a way to carry it forward with a view to emulate it in other regions.

The specific guidelines we have enunciated for projects are as follows:

- projects that contribute to the flow of ideas
- projects based on ideas that emerge within a country and are perceived to have subregional, regional, or global significance
- projects that encourage curriculum development within a region or subregion, where local requirements have indicated a demand
- projects that contribute to the distribution of good practice and information within a region or subregion, using the appropriate language
- projects strongly urged by Divisions and Standing Committees that have an educational dimension or are perceived as relevant to the public understanding of chemistry
- projects that reach into regions and subregions that are currently under-represented in IUPAC activity
- projects based on innovations within a country that are perceived by those outside the country as having potential regional or global significance
- projects encouraging inter-Union collaboration [See Bob Bucat's report on page 7]
- projects that are innovative in the realm of the public understanding of chemistry
- projects that are a response to an explicitly demonstrable demand within a region or subregion
- projects that encourage collaboration between countries in a region or between regions and subregions
- projects for which IUPAC seed money is helpful to gain access to other sources of funding

The CCE is well aware that hugely important regional enterprises are taking place in other parts of the world, and that developments there should also be encouraged. So, if you have ideas along these lines, then we would be more than happy to develop them. Of course, you might have bright ideas that do not conform fully to these guidelines: we would not wish to dissuade you from putting them forward.

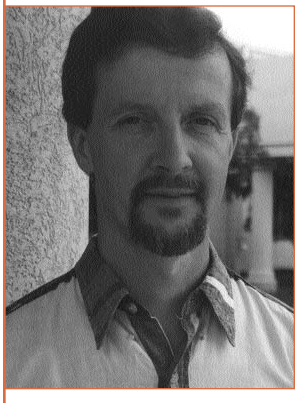
Both subcommittees are currently hard at work formulating projects in their particular domains of activity, and I will write about them in a later article. Meanwhile, I hope you see that we have gotten off to a vigorous start and that the CCE will contribute to the worldwide propagation and appreciation of chemistry.

Peter Atkins <peter.atkins@lincoln.ox.ac.uk> is CCE chairman and professor at the Lincoln College, in Oxford, UK.

www.iupac.org/standing/cce.html

On the Public Understanding of Chemistry

Encouraging the Flow of Ideas



by Peter Mahaffy

An important objective of IUPAC's revised chemical education efforts was to give increased attention to the critical interfaces between chemistry and society. Chemistry as a science cannot flourish in isolation, but must develop within a context of public understanding and mutual trust. Thus, one of the Union's long-range goals is to "advance the public understanding of chemistry."

I'm pleased to report that IUPAC's efforts to focus on the two-way flow of ideas between chemistry and society have had a fruitful beginning with the formation of the CCE Subcommittee on the Public Understanding of Chemistry (PUC). The subcommittee held its first informal meeting at the 17th International Conference on Chemical Education in Beijing in August 2002. The five out of eight members who were able to attend set the directions for the committee's work.

The contexts for chemistry and for its interactions with society are fundamentally different in the various parts of our global village. It is therefore a daunting task to map what projects in this area are being undertaken by chemical societies, industry, educational institutions, and nongovernmental organizations. The subcommittee is aware of the impressive existing initiatives in this area and the limited resources within PUC. The biggest challenge will be to avoid duplicating existing efforts and to explore what activities will best fit with IUPAC's mission and focus.

The PUC subcommittee agreed to prepare a proposal for an IUPAC project to initiate this mapping and evaluation of existing public understanding of science efforts and to propose a focus for PUC activities. Consistent with IUPAC's focus, activities will likely be centered on facilitating communication among those responsible for on-going public understanding initiatives, and encouraging others to fill in the gaps that are identified. It is clear that much of our work will be done electronically, and the Internet will be an important tool in communicating what is being done. Bob Bucat <bucat@chem.uwa.edu.au> has agreed to coordinate the preparation of a project proposal. He welcomes your comments.

A public launch of the IUPAC CCE Public Understanding initiative will take place on 14 August 2003 at the 39th IUPAC Congress, held jointly this year with the 86th Conference of the Canadian Society for Chemistry (session CE03 of the Congress). On that date a series of three symposia featuring invited speakers will be held, focusing on various aspects of the public understanding of chemistry. Symposia titles and the committed invited speakers are as follows:

- *The Flow of Ideas Between Chemists and the Public Through the Media,* sponsored by DOW Canada, and featuring Madeleine Jacobs, editor in chief of *Chemical & Engineering News*, as one of the confirmed speakers. Other representatives from the media and chemists dedicated to promoting the public understanding of chemistry will also be featured.
- *The Flow of Ideas from the Research Lab to Industrial or Public Use,* sponsored by Imperial Oil, featuring Howard Alper, president of the Royal Society of Canada as one of the confirmed speakers. Other representatives from government and industry will also address this interface.
- *The Flow of Ideas Through Society,* sponsored by Shell Canada Chemicals, featuring Tim Faithfull, president of Shell Canada, and Stuart Smith, past chair of the National Round Table on the Economy and Environment, as confirmed speakers. Other speakers will also address the interactions among chemistry and other key disciplines concerned with the health of people and the environment, social justice, economic growth, and general public aspirations.