IUPAC in Torino, Italy—Part II

The 41st IUPAC World Chemistry Congress, which had the theme of "Chemistry Protecting Health, Natural Environment, and Cultural Heritage," was held at the Lingotto Conference Center in Torino, Italy, 5–11 August 2007. The Congress, which was co-organized by the Italian Chemical Society, the National Research Council of Italy, the University of Turin, and the Polytechnic of Turin, is an international scientific conference that meets concurrently with the General Assembly, the meetings of the governing bodies and committees of IUPAC.

Plenary lecturer Kurt Wüthrich (left) and Francesco De Angelis, co-chair of the Congress International Advisory Board and president of the Italian Chemical Society.

The Congress <www.iupac2007.org> attracted approximately 2 000 attendees from around the world. Plenary lectures were given by the following eminent chemists:

- Roald Hoffmann (Nobel laureate, Cornell University, USA), "Science and Ethics: A Marriage of Necessity and Choice for this Millennium"
- Kurt Wüthrich (Nobel laureate, ETH, Switzerland), "Protein Structure Biology Using NMR—At the Interface of Chemistry and Biology"
- Jan Wouters (Royal Institute for Cultural Heritage, Belgium), "Reflections on the Position

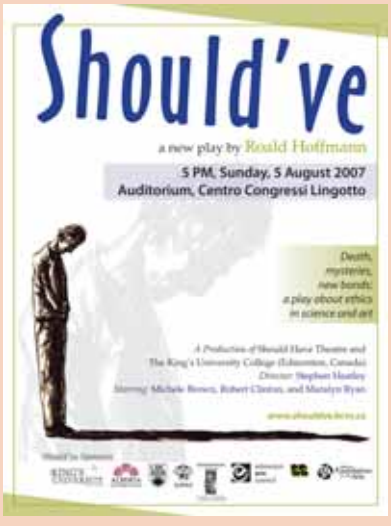
"Chemistry is Beautiful"—A Report on the Opening Plenary Lecture by Roald Hoffmann

by Neil Gussman

"Chemistry has so much to be proud of," said chemist, poet, playwright, and polymath Roald Hoffmann in his opening plenary lecture at the IUPAC Congress in Torino. Hoffmann's talk, which began with chemistry then gave a glimpse of his views on philosophy and human nature, preceded a staging of his latest play, *Should've*.

Hoffmann, the 1981 Nobel laureate in chemistry, credits the chemical sciences with providing spiritual as well as material progress to humanity. "Knowledge of genetics, of the cosmos, of the color of cornflowers" is just part of an "incredible gain in knowledge" through chemistry, Hoffmann said. He noted that the knowledge that chemistry gave the world supplied "improvements for some, but not for all."

Hoffmann then turned from chemistry to its effect on society. "People are not happier," Hoffmann said, referring to people in cultures that have the benefits of modern science, "and many do not praise technology" because "people are not happy by nature." That comment started a small buzz in the audience. Hoffmann went on to say that the divide between those in the sciences and the wider population exists because "people are not machines. They are wonderful, vexing beings. Science cannot understand people."



Speaking of how little the general public understands chemistry, he said, "Half of the nitrogen atoms in me are from a chemical reactor through the Haber-Bosch process." It was clear from the buzz and nods that this fact was news to many—even in an audience more familiar with chemistry than just about any similar-sized group on the planet. Since it went into use in Germany at the beginning of World War I, the Haber-Bosch process has been the source of an ever-larger fraction of the nitrogen available for biological processes.

Hoffmann then addressed the perception of chemistry among the wider public. "In the past 50 years, pollution has changed from normal entropy to a sin," he asserted. The public perception of chemistry descended from a mid-20th-century source of innovation and products to make life better to a source of pollution and a threat to health. He then proposed a three-point plan to reconnect chemistry with the world at large. Chemistry leaders should:

1. accept human nature

of Chemistry in Multidisciplinary Approaches, Aiming at Protecting Cultural Heritage" (See related feature on page 4.)
- Robert Huber (Nobel laureate, Max-Planck-Institut für Biochemie, Germany), "Proteins and their Structures for Basic Science and Application in Medicine"
- Akira Fujishima (Kanagawa Academy of Science and Technology, Japan), "The Increasing Contribution of Photocatalysis to Comfort and Safety in the Urban Environment"
- Vincenzo Balzani (University of Bologna, Italy), "Molecular Devices and Machines"

A follow-up to Hoffmann's lecture was the premiere performance of his new play *Should've* during the opening session of the Congress. The fully staged production of the play, which explores ethics through the intersecting worlds of science and art, was presented by the Should Have Theatre, an independent professional theater company hosted by The King's University College of Edmonton, Alberta, Canada. The play featured Michele Brown as Katie Wertheim, Maralyn Ryan as Julia Hollander, and Robert Clinton as Stefan Cardenas. Peter Mahaffy (The King's University College), chair of the Committee on Chemistry Education, served as the liaison between IUPAC and the production team, which included his son Reuben, who was videographer and projection designer.

In another significant event, the City of Torino and IUPAC held an evening meeting at the Gallery of Modern Art in memory of Primo Levi, Turinese writer, chemist, and Jew, on the occasion of the twentieth anniversary of his death. Recollections of Levi were expressed by people who knew him and had worked with him, and through a film. Roald Hoffmann, himself

2. introduce ethical and ecological concerns in all chemical training
3. reawaken the primary motive of science, to meliorate the human condition

Hoffmann turned 70 in 2007. Born in 1937, his early life was marked by one of the worst crimes in human history. "The feeling of being dealt with unfairly causes real pain," he said, yet he added, "I remain an optimist despite or because of surviving the Holocaust."

Next he turned to the effect the free market can have on ethics, saying, "Market conditions alone do not provide motivation for ethical production decisions." He cited the choice between producing malaria drugs and Viagra as an instance of where the free market can lead.

As he brought his talk to an end Hoffmann connected creativity and responsibility to describe the tension central to his latest play. He takes creativity as a given of human life: "As we create—we cannot help creating—we have a responsibility to ask about final use."

He then took a seat with the audience and watched the premiere of his third play, which follows the family of a scientist who committed suicide as they deal with the consequences and the meaning of his death and the choices they made because of him.

Hoffmann remained in Torino for much of the week that followed, participating in discussions and public events during the biennial congress. He is very well known for saying "Chemistry is beautiful." Through plays and poetry, he brings his own perception of beauty to audiences who might otherwise never be able to see what he sees in chemistry.

***On stage in Torino, Michele Brown as Katie Wertheim and Robert Clinton as Stefan Cardenas in the first production of* Should've.**
For more about Roald Hoffmann's Should've, *see May-June 2007 CI, pp. 4–7.*

Neil Gussman <NeilG@chemheritage.org> works at the Chemical Heritage Foundation (CHF) www.chemheritage.org. In Torino, he represented CHF and attended the meeting of the IUPAC Committee on Chemistry Education (see p. 16). CHF shares common goals with, and is an Associated Organization of, IUPAC.

a Holocaust survivor, offered a very moving tribute to the works of Levi, who survived internment at Auschwitz, and the impact they had on his own teaching and writing.

Invited and contributed oral and poster presentations at the Congress were made within 10 topical groups: environment, health, cultural heritage, materials and nanotechnology, theoretical and computer chemistry, inorganic chemistry, analytical chemistry, organic and polymer chemistry, biological and biophysical chemistry, and chemical education.

The next IUPAC Congress and General Assembly will be held 1–9 August 2009, in Glasgow, Scotland. If you wish to look further ahead, Puerto Rico will be the venue of the Congress and General Assembly from 30 July–7 August 2011.

www.iupac2009.org
www.iupac2011.org

Division Roundups—Part II

Part 1 of the Division Roundups from the 2007 General Assembly in Torino, Italy, appeared in the Nov-Dec 2007 *CI* (page 7). That article covered Division IV: Polymer, Division V: Analytical Chemistry, Division VI: Chemistry and the Environment, and CHEMRAWN. Prior to the GA, all divisions and standing committees provided a written report that is part of the *Council Agenda* book available online <www.iupac.org/symposia/conferences/ga07/council_agenda.html>.

Committee on Chemistry Education (CCE)

Morton Z. Hoffman, U.S. National Representative

The meeting of CCE, which was chaired by Peter Mahaffy, began with approval of the minutes of its previous meeting at the 19th International Conference on Chemical Education (ICCE) in Seoul, Korea, in August 2006, and a report of the executive strategy meeting that took place in Paris in March 2007.

Among the priority areas of concern of CCE are the ethical education of young chemists, the social responsibilities of scientists, the multiple uses of chemicals for peace and weapons, the relationship of chemistry and sustainable development, and the shift from teacher-centered to user-directed chemical education.

Reports were presented from the subcommittee on the Public Understanding of Chemistry about the procedures that would have to be followed in order for 2011 to be designated by the United Nations as the International Year of Chemistry (note was made that 2007 was the Year of Chemistry in Spain), and from the subcommittee on Chemistry Education for Development about the current Flying Chemists Program to revitalize tertiary education in the Philippines. This latter subcommittee also reported on the establishment of the Network for Inter-Asian Chemistry Educators, among Korea, Japan, Hong Kong, China, and Taiwan, which held a symposium in Taipei in July 2007.

Next on the agenda was a presentation by the Chemical Heritage Foundation (CHF). Edwin "Ted" Becker, long-time officer of both IUPAC and CHF, opened the session by describing the Philadelphia-based organization using its mission statement of treasuring the past, educating the present, and inspiring the future. Becker briefly described the collections, including thousands of rare books in the history of chemistry and early science, the world's largest collection of art about alchemy, and many artifacts as varied as 18th century lab glassware and mid-20th century chemistry sets. Addressing CHF's education outreach, he talked about the ways in which IUPAC and CHF could cooperate to extend the reach of both organizations, particularly through the web.

Becker was followed by Neil Gussman, who spoke about current programs at CHF and how he saw them fitting together with IUPAC efforts. Gussman is the communications manager for CHF and has more than 20 years experience in public relations for chemical clients. He was particularly impressed by the way the education committee considered real-world communications and the public image of chemistry in its efforts. Other organizations with the goal of increasing education outreach do not consider how the public will view such efforts, dooming them to failure.

Alistair Hay presented a brief report on IUPAC's collaboration with the Organization for the Prohibition of Chemical Weapons (see Nov-Dec 2007 *CI*, pp. 23–25) that focused on producing educational materials. Hay discussed the newly developed web site <www.iupac.org/multiple-uses-of-chemicals>.

In more recent years, CCE has developed better communication with other IUPAC divisions. The chairman and Eva Åkesson, in her role of divisional liaison officer, visited all eight divisions during the General Assembly to present CCE. Some of the projects and priorities for the future were highlighted, such as the Young Ambassadors for Chemistry, International Year of Chemistry, 20th ICCE, and learner-centered edu-

Morton Hoffman (left), U.S. national representative on the Committee on Chemistry Education, and Vincenzo Balzani, plenary lecturer at the IUPAC Congress.

cation. Future collaboration and joint projects were discussed. A recurrent topic echoed from each group was the need to better plan for publication, including an educational component, and the need to assess carefully the accessibility level of that information.

Members of CCE presented reports about the chemical education issues that confront their countries, such as incorporating green chemistry into the curriculum, interesting students toward the study of chemistry, improving the abilities of chemistry students, and increasing the time spent by students on the study of chemistry at the primary and secondary levels. My report on the state of chemical education in the USA emphasized the important role of the ACS, its committees, technical divisions, and publications, in producing materials across the educational spectrum, reaching out to high school teachers, encouraging research in educational practices and teaching and learning, and working to reflect the changes that are taking place within chemistry and the other molecular sciences in curricular content and pedagogical approaches. Special mention was made of the proposed revision of the ACS Committee on Professional Training guidelines for the approval of departmental chemistry programs and the certification of their bachelor graduates by the ACS.

The 20th ICCE—Chemistry in the ICT Age will be held 3–8 August 2008 in Pointe Aux Piments, Mauritius <www.uom.ac.mu/icce>. Among the plenary lecturers will be Roald Hoffmann, Loretta Jones (University of Northern Colorado), Peter Mahaffy (The King's University College), Peter Atkins (Oxford University), Henry Schaefer (University of Georgia), Arthur Olson (Scripps Research Institute), and John Bradley (University of the Witwatersrand, South Africa). The meeting will be preceded by an on-line conference on "Computational and Theoretical Chemistry Applications in Chemical Education," which will be part of the CONFCHEM Conferences on Chemistry of CHED <www.ched-ccce.org/confchem>. A satellite conference at the University of Nairobi (Kenya) will follow the ICCE.

CCE voted to accept the bid of Taiwan to host the 21st ICCE in 2010 in Taipei; the focus of the conference will be communication about the teaching of chemistry. Bids for the 22nd ICCE in 2012 are being accepted as well as expressions of interest for the 23rd ICCE in 2014; the plans for both future conferences will be discussed by CCE in Mauritius. For further information, please contact me as the CCE conference coordinator.

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Division VII. Chemistry and Human Health

Mukund S. Chorghade, secretary

Thanks to a proactive and rigorous effort by the nomination committee, Division VII's elections were a resounding success. Tom Perun, chair of the Nominating Committee, reported that the election process was smooth, the number of candidates of excellent caliber was high, and the electoral response was nearly 70 percent. We have a broad geographical representation and diversity on the Division Committee as well as significant new expertise. Doug Templeton was elected president-elect until January 2008. He will become president in January 2008 following the retirement of Paul W. Erhardt.

Erhardt presented the annual report that was submitted to the Bureau and mentioned the highlights/salient features. The division's report adhered to all prescribed guidelines and received favorable responses from other divisions. One of the highlights he mentioned was *Analogue-based Drug Discovery*, a book on medicinal chemistry that arose out of division projects and has received excellent reviews in professional journals and sold out its first print run of 800. Mention was also made of the successful IUPAC-Richter Prize venture. Erhardt also discussed the following important projects.

Practical Studies for Medicinal Chemistry Students—An Integrating Approach for Developing Countries by Antonio Monge (project 2004-028-1-700) was published as a web edition in January 2007. The book,

in Spanish or Portuguese and English, is available for free online.

Excellent progress has been realized on the following projects:

- concepts and structure for requests in clinical laboratories
- internationally agreed terminology for observations in scientific communication
- mapping of IFCC-IUPAC laboratory coding system to SNOMED CT
- securing and structural updating of information in the NPU coding system and its environment
- recent advances in Nomenclature, Properties, and Units: strategy for promoting SC-NPU achievements

The second edition of the glossary of terms used in toxicology was published in the September 2007 issue of *Pure and Applied Chemistry*. Philip Wexler, National Library of Medicine, Division of Specialized Information Services, will incorporate this into his book *Information Resources in Toxicology*.

Work has commenced on the "Explanatory Dictionary of Concepts in Toxicokinetics (part II)" and is expected to be completed within the stipulated time. Once complete and accepted for publication in *PAC*, parts II and I will be combined, revised, and reformatted into book form to be published by the Royal Society of Chemistry under the title *Concepts in Toxicology*.

The Division had four posters exhibited at the Congress in Torino. There was one general poster presenting the activities of the Chemistry and Human Health Division and one poster for each of the three subcommittees: SC on Nomenclature, Properties, and Units in Laboratory Medicine; SC on Medicinal Chemistry and Drug Development; and SC on Toxicology and Risk Assessment.

Committee on Chemistry and Industry (COCI)

Michael Booth, secretary

The well-attended COCI annual meeting, held 6–7 August 2007, included 13 COCI members, four safety trainees, three divisional representatives, and the remainder either observers or invited participants. The meeting focused on the committee's role and strategic priorities, organizational structure, and programs and accomplishments. COCI is currently considering joint projects with divisions and other standing committees with an emphasis on biomonitoring and aspects of human health. A number of members agreed to serve on a fundraising committee to bolster the funds available to the committee over and above the operations and project budget.

The Safety Training Program, in which professional chemists and chemical engineers in developing countries are exposed to safety practices of the chemical industry in the developed world, continues. At the meeting, it was reported that two more trainees had undergone training at the Mitsui Corporation in Japan. There is no shortage of trainees wishing to participate in this program, which enjoys wide acknowledgement in IUPAC. A recurring problem, however, is the availability of host companies. An idea for a spin off of the program, initiated by one of the Uruguayan trainees, is to develop a safety training program in South America.

One of the new initiatives of the committee is to foster closer collaboration with trade associations, particularly with CEFIC (the European Trade Association) and the International Council of Chemical Associations. COCI organized the World Chemistry Leadership Meeting (WCLM) at the General Assembly as part of its process of collaboration. The proceedings of the WCLM will be reported on the IUPAC website (see feature on page 10).

COCI continued to promote the recruitment of new company associates and a new brochure expounding the merits of joining IUPAC is in the final stages of publication. The committee continues to work with the Committee on Chemistry Education on promoting the public appreciation of chemistry. A decision was also made at the meeting to forge closer interactions with National Adhering Organizations. As a pilot project, it was decided to run a workshop with NAOs in Europe as part of the annual meeting in Marl, Germany, in April 2008 (see IUPAC project 2006-030-1-022, <www.iupac.org/projects/2006/2006-030-1-022.html>).

At the project meeting earlier in the year, new projects were proposed on biomonitoring, nanotechnology, and human health, and on biofuels. Presentations were made at the meeting to decide how project proposals should be advanced.

The possibility of introducing an award that recognizes and reinforces the ideals perpetuated by COCI was debated at the end of the meeting. Further recommendations will be advanced at the Marl meeting.

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