INTERNATIONAL AND NATIONAL CONFERENCES IN SCIENCE EDUCATION

18th International Conference on Chemical Education, Istanbul, August 3 - 8, 2004

Organized by the Turkish Chemical Society, the biennial meeting was sponsored by the International Union of Pure and Applied Chemistry (IUPAC), the Republic of Turkey, the Organization for the Prohibition of Chemical Weapons, and UNESCO (United Nations Educational, Scientific, and Cultural Organization). More than 250 educators from 66 countries – hight school and university teachers, about half of them from Turkey and the more numerous group from Europe – gathered to discuss ways to improve chemistry education. The conference took place in the beautiful city of Istanbul; a city that throughout the history has been a bridge between different cultures, and it was excellently organized by the local organizing committee; The conference was opened by PETER ATKINS, a physical chemistry professor at the University of Oxford and chairman of the Committee on Chemistry Education: he presented a talk bearing the title "Communicating Chemistry: The Challenge". As teachers we face many difficulties and ATKINS choose to focus on only three: abstraction (atoms, molecules, energy, entropy), mathematics, and complexity (the avalanche of facts, the multiplicy of concepts, the interplay of inferences), all of which are dependent on each other.

The second plenary lecture "Chemistry Education: The Shape of Things to Come" was delivered by PETER MAHAFFY, a chemistry professor at King's University College in Edmonton, Canada. Professor MAHAFFY sees visualizations as an important tool in teaching chemistry, together with metaphors. He suggested that we develop the well known triangle of different thinking levels in chemistry as put forward by ALEX JOHNSTONE – symbolic, macroscopic, and molecular – in a tetrahedron, adding the "human element".

JOSEPH J. LAGOWSKI of the University of Texas at Austin delivered an interesting plenary lecture on "The Chemistry Laboratory In A Digital World". After presenting an historic development of the chemistry laboratory, he contrasted two current opposing views: one school of thought asserts that the lab is absolutely necessary, while the other believes that the lab is a waste of time and money.

The second day opened with a plenary lecture "Chemistry Education For Development" by JOHN BRADLEY of the University of the Witwatersrand, Johannesburg. He presented some data from international studies and demonstrated that the students in richer countries score better in science than those in poorer countries.

In the afternoon ROBERT BUCAT, a professor of chemistry at the University of Western Australia, presented "Implications of Chemistry Education Research: Pedagogical Content Knowledge as a Way Forward". Prior to 1975, the chemical education community was concerned mainly with the subject matter ("What should we teach?"); but since then, there has been a surge in research focus into the question "What is learned?", BUCAT said.

The Saturday plenary lecture "How To Facilitate Students' Conceptual Understanding of Chemistry? - A History and Philosophy of Science Perspective" was presented by MANSOOR NIAZ, a professor of Science Education at the Universidad de Oriente, Cumaná, Venezuela. Presenting data from many interesting studies, he demonstrated the utility of knowledge of history and philosophy of science in science education.

JACK HOLBROOK, Visiting Professor at University of Tartu, Estonia, then talk about "Making Chemistry Teaching Relevant". We need to make chemistry teaching relevant on the eyes of our students relating it to life outside school, and presenting it with the goal of building a challenging atmosphere within the classroom.

Another central event of the day was the nine workshops: one of them was organized by Prof. AMMEEN F.M. Fahmy of Science Ain Shams University, Abassia, Cairo. "Systemic Approach To Teaching And Learning Chemistry (SATLC) in Reform of Chemical Education: (A Global Perspective)". To disseminate the aim and the ideas of this interesting approach LAGOWSKI suggest the creation of the *Journal of Systemics* (www.JournalofSystemics.cm.utexas.edu).

JOHN OVERSBY, from the University of Reading in the UK, gave two presentations arising from his collaborative work with teachers and other colleagues. In the USA NSF-funded PALAVA project, concerned with Particles And Learning And Visualisation Assessment, he gave details of the use of cartoon storyboarding as a method of eliciting students' modelling processes.

The first plenary lecture of Sunday, "A National Survey Of Students' Conceptions In Chemistry" was presented by MEI-HUNG CHIU, of the National Taiwan Normal University. The purpose of the four-year study was to examine students' understanding of some foundamental chemical concepts. About 14,000 students – from grades 6, 8, 9, and 11 – were selected for this investigation. CHIU presented some typical misconceptions and the potential causes for generating students' misconceptions at the different age levels. As we know, students' do their best to explain their ideas.

AYHAN ULUBELEN, from University of Istanbul, presented "Chemistry Education and Chemical Industry In Turkey", an excursus on the historic development of systematic chemical education and the importance of chemical industry. Formally established from 1980, chemical education is supported by 15 departments.

Our feeling is that the ICCE meeting was attended by two quite distinct and separate groups – university chemistry professors and a smaller group of chemistry educators interested mainly in teachers working in secondary schools. The plenaries are dominated by the university chemical position, unsurprising since the meeting is organised by IUPAC. It was clear from the plenary presentations that there is much to be anxious about, especially the decline of interest in pure chemistry across the world. Large classes in the tertiary sector (one example can be of classes as big as 1300) and serious colleagues trying their best to promote good learning in an environment more designed towards mass teaching seem to be very common. The curriculum came under scrutiny as PETER ATKINS suggested that core chemistry concepts are contained in six basic equations, suggesting the richness of simplicity, while MANSOOR NIAZ demonstrated the relevance of historical chemistry for a better learning.

We did enjoy many of the short talks we attended, since they often focused on exploring specific details of learning chemistry. There was plenty of data to analyse and to learn from. We appreciated that chemical education research is alive and kicking and was very pleased to be part of those discussions.

The social side of the meeting was superbly organised, from the opening reception, through the cultural show and the boat touron the Bosphrus, to the final banquet by the water. Such events in every conference can soften the differences between people and cement developing relationships.

The 19th ICCE will be held from August 12-17, 2006 in Seoul, Korea (www.19ICCE.org).

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7th EUROPEAN CONFERENCE ON RESEARCH IN CHEMICAL EDUCATION (ECRICE) AND 3rd EUROPEAN CONFERENCE ON CHEMICAL EDUCATION (ECCE)

Faculty of Education, University of Ljubljana, 24–28 August 2004

After Montpellier, France; Pisa, Italy; Lublin, Poland; York, England; Ioánnina, Greece and Aveiro, Portugal, this year's Conference on Research in Chemical Education was hosted by Ljubljana, Slovenia. A total of 128 experts, from 22 European and 4 other countries, participated in the conference. The majority of the participants were university lecturers, but about a quarter of them were primary and secondary school teachers and university students. The Slovenian delegation represented about one-fifth of the participants. The Ljubljana conference was also characterized by the fact that as a rule, most of the participants actively participated in the conference program, whether as lecturers, presenters of research and projects, or as creators of poster displays. The conference programme was filled by plenary lectures, keynote lectures, oral presentations of research and projects, workshops that took place in multiple sessions simultaneously, and poster displays.

Plenary lectures

The plenary lectures were composed of contributions that presented specialized fields and new findings in chemistry; contributions that illuminated problems in teaching and research in chemical education; and lectures that linked both areas: that is, contemporary discoveries in chemistry and contemporary instruction.

Academician MIHA TIŠLER gave the opening lecture. He talked about the connections between chirality as a molecular property and the biochemical function of a molecule with this property. In his lecture, professor JOHN K. GILBERT from The University of Reading in England and editor of the respected periodical *International Journal of Science Education* discussed the importance of the creation and use of models in studying and teaching chemistry. He positioned chemistry as a school subject within the framework of general literacy in the natural sciences. Professor MAHESH K. LAKSHMAN, who currently teaches at the City College of New York and is one of the leading experts in the synthesis of nucleosides using palladium as a catalyst, spoke about his area of research. Professor URI ZOLLER from the University of Haifa-Oranim in Israel brought the participants' attention back to the subject of education. He spoke about what kind of chemistry lessons promote literacy in the natural sciences at a time of sustainable develoment. Professor ERIK THULSTRUP from Roskilde University in Denmark also talked about different ways of teaching and studying chemistry. He posed four questions: how to better motivate students, how to develop thinking as well as knowledge, how to broaden the study of chemistry to other boundaries of the discipline: integrated natural sciences, and to present the natural sciences and technology as an interest-