

## 4<sup>th</sup> National Meeting and 1<sup>st</sup> International Meeting on University Chemistry Teaching

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In 1986 IUPAC sponsored the First Regional Seminar on Teaching Chemistry Methodology, Updating and Improvement that was held at La Plata (Argentina). The recommendations produced during the Seminar, that was attended by specialist from Brazil, Uruguay, Chile, Bolivia and Argentina; included the necessity of organizing periodic meetings to present, analyze and discuss new ideas concerning Chemistry teaching at the University, specially for undergraduate students.

As a consequence of this Seminar, the Asociación Química Argentina (AQA) through its Chemistry Teaching Division organized the University Chemistry Teaching Specialist Group. This Group is integrated by recognized university professors working at different National Universities. The main goals of this Group are to promote research in Chemistry Teaching at the University and to publicize the work done in this area at the Universities.

According to its purposes, the Group is in charge of the organization of periodic meetings under the name of: "Jornadas Nacionales de Enseñanza Universitaria de la Química" (National Meeting on University Chemistry Teaching). The first one has been held in 1992 at the National University of Rosario, then in 1994 at the National University of Buenos Aires, and in 1997 at the National University of Córdoba.

The last Meeting was be at the National University of "El Litoral" (Santa Fe, Argentina) between May 24<sup>th</sup> and 28<sup>th</sup>. With the sponsorship of IUPAC' s CTC, the Argentinean Chemical Society (AQA), declared of state interest by the government of Santa Fe Province the meeting has been also registered for the International Chemistry Celebration organized by the American Chemical Society (ACS).

The Dean of the Faculty of Biochemistry and Biological Sciences, Prof. Eduardo Villareal and the Dean of the Faculty of Chemical Engineering, Prof. Pedro Mancini, acted as Chairman of the meeting. Prof. Héctor Odetti was the Vice-Chairman and Prof. Lydia E. Cascarini de Torre was the Honorary Chairman of the meeting. Prof. Ester Ocampo was the chairman of the executive organizing committee. This meeting that has been the first major event in which the AQA's Regional Delegation has been involved showed the projection of AQA's activities in the country. Among other very well known professors from Europe and America the President and Secretary of IUPAC's CTC, Professors John Bradley and Hans Bouma have attended the meeting.

The meeting was organized around Plenary Lectures and Round Tables all held in a beautiful scenery provided by the "Paraninfo Room" of the University a place very deeply

related to the history of Argentina since it has been the place where the country Constitution has been voted. The meeting activities were complemented with poster exhibitions, workshops and special group's discussions. More than two hundred papers have been presented by a similar number of professors that attended the sessions. Some selected papers were given a special space for their presentation.

The organizers planned several sections for poster presentations:

- Chemistry, sustainable development and environment.
- Computational Chemistry and educative technologies.
- Chemistry Curriculum and evaluation.
- Secondary School - University transition within the framework of the Educative Reform.
- Chemistry Didactics.
- Chemistry Teaching and Industry.
- Projects devoted to the improvement of Chemistry Teaching at the University.

Papers of very good quality have been presented in all sections that have been authored by university professors some of them exhibiting a long and successful career as professors and researchers.

After the Opening Ceremony the first plenary lecture was given by John Bradley, professor of the University of the Witwatersrand, Johannesburg where he is the head of the Chemistry Education group and where he had also developed a cooperation program (UNESCO - CTC) on microchemistry for which he has developed a very nice experiments kit. The main goal of this project is to promote the development of the experimental chemistry overcoming its main problems originated in security, waste disposal, and budget and teachers level. The kit that is designed for individual work includes simple worksheets has been successfully employed in developed as well as underdeveloped countries. Prof. Bradley has performed a large number of workshops mainly in countries with low resources with the aim of revitalize the education in chemistry. His lecture attracted the attention of such a number of attendants that a workshop was organized to show the use and to explore some of the possibilities of the experiment kit. The kit is commercialized by Somerset Educational - Crewe- Brown Av. Somerset East 5850, Republic of South Africa.

The second plenary lecture was given by Prof. Hans Bouma who discussed a very interesting topic that belongs to science philosophy: "Tension between Religion and Science: Hostile Environments". He said among other things that "Between (Christian) religion and the sciences regularly clashes have been observed, ostensibly flashes of lightning as a consequence of tension built up between both fields. A very early and notorious case is the clerical lawsuit against Galileo in 1633. But vehement discussions also took place e.g. regarding the age of the earth, the evolution theory which still is a bone of contention in some of the United States, and the future of the universe, just to mention a few examples". During his lecture he has presented the positions of scientists and theologians. As a consequence of experience and based on the fact that both use different languages, he concluded that both science and religion should follow parallel paths and never cross.

Professors Marisa García and María Grompone presented a very careful and practiced lecture on a subject that they entitled: "Chemistry Education and Industry: Short University Careers with Technological Profile". Within the framework of a Program for Technical Enhancement, financed by the Interamerican Development Bank (BID), they carried out interviews with professionals working at the most representative industries of their country, Uruguay. Once they had defined the required profile they elaborated a two step proposal. The first should take place at the secondary school level. In Uruguay people attend the technological secondary school between 16 and 18 years old. A basic group of courses aimed to provide a basic education has been planned. These courses are followed by a second group aimed to provide a basic scientific education including the acquisition of habits and hands-on experience. At the end of this stage the student is prepared to perform tasks as laboratory assistant. The second step, two years, completes the profile of a chemical technologist producing a laboratorist with a certain degree of specialization in different areas of industry. This step is in charge of the Consejo de Educación Técnica and the Faculty of Chemistry of the University "De La República". The plan was started in 1997 and the authors are confident on the success of this new educative offer, which implies a conceptual change in technical education in Uruguay. They also believe that it could contribute to improve the relationship between education and industry and at the same time it could serve as model for the region.

Prof. Miriam Medina Mesa developed an interesting subject that she entitled: "Improvement of Curricular Activity for Teaching Chemistry as a Basic Science: Challenge and Necessity". She took as example the design of Chemistry as a discipline for careers to which this science is basic.

The last two lectures have been given by professors from Spain. Prof. Manuela Martín Sánchez, University "Complutense", and Prof. Juan Ignacio Pozo, University "Autónoma", both from Madrid. Prof. Martín Sánchez lectured on the subject: "Experimental work in Chemistry Teaching at Non-University Levels". She began in Henry Bent's line that states that the closest to an ideal situation is the search for equilibrium among all the possibilities. She cited several phrases that consider equilibrium as the path to perfection. This idea has been cited by Apollo's oracle at Delfos and a large number of images engraved in stone that can be found at the University of Salamanca. She considered the lack of equilibrium as very dangerous in Chemistry teaching and cited as example the argument between knowledge and skill. She studied the importance of experimental work as something that must be a part of other works. She supported her ideas on Bent's arguments particularly when she quoted him: "To try that a student comprehend chemistry without experiments is like to try that a blind person could comprehend the color concept". In addition to its usefulness to learn chemistry, experiments are very important for the education and formation of students at the elementary level because they develop observation skills that are very useful for all citizens. She ended her lecture showing some overhead projector and low cost experiments.

Prof. Pozo lectured on the contribution of psychology to the change in chemistry education. He said that present times, where there is a growing necessity of curricular adaptation at all educative stages, new ways of educating, new goals and new contents are

needed. To achieve these goals it is necessary to employ recent results obtained with the psychology of the learning process.

University professors that teach chemistry professors had a meeting where they discussed the problems and made interesting proposals to continue the discussion in future editions of this meeting.

It must be noted that the interest showed by university professors and the quality of the presentations are indicating the growing importance that education is acquiring. Professors from almost all the universities of Argentina attended the meeting together with a large delegation from different countries from the region (Brazil, Chile, Cuba, Mexico and Uruguay).

The attendance of distinguished professors from Holland, South Africa and Spain contributed to the discussions of important topics and to establish contacts tending to a deeper integration with other Latinamerica regions. The meeting also provide an adequate background to discuss new solutions to the problems encountered in the everyday practice of chemistry teaching. The local organization that has been excellent could be appreciated during the entire meeting. A very nice welcome dinner and a local choir performance and the delicious "alfajores" contributed to have three days full of friendship.

During the Closing Ceremony CTC's President congratulated the organizers and expressed his satisfaction because the CTC has been involved in the event. It was also announced that the next venue of the meeting will be Montevideo, Uruguay, on the year 2001, and that its organization is in charge of Prof. Grompone, García, Rodríguez Ayán and Miguez, all from the University of "La República".