

CHEMRAWN XI

The latest in the series of CHEMRAWN Conferences was held on 15–20 March 1998 in Montevideo Uruguay. A summary of the conference is provided by Prof. Folke Ingman, President of Division V. This is followed by the Statement of the Meeting and of the Future Actions Committee as reported by Prof. Patrick Moyna, organizer of the conference.

CHEMRAWN XI, Montevideo, Uruguay, 15–20 March 1998

The eleventh CHEMRAWN Conference was arranged by Prof. Patrick Moyna (member of the CHEMRAWN Committee) and his co-workers at Facultad de Química, Universidad de la República in Montevideo. The topic of the conference was Environmental Chemistry and part of it was devoted to the Latin American Symposium on Environmental Analytical Chemistry. Approximately 250 scientists, mainly from Latin American countries, attended. The conference programme included 26 plenary lectures given by well known scientists and could be divided roughly into three categories:

- Methodological topics ranging from modern sampling techniques and speciation of trace metals in environmental samples using Flow Injection Analysis, to LC-MS-MS, to computational methods in atmospheric chemistry, to different kinds of quantitative spectroscopy involved in Process Analytical Chemistry.
- Quality assurance in Environmental Analytical Chemistry was in many respects the main theme of the conference. Several plenary lectures were devoted to this area including laboratory proficiency testing programmes. A condensed course on laboratory accreditation was also included in the conference.

- Discussions of several programmes aiming at monitoring environmental pollution. A report on the performance and results of a six-year German/Brazilian environmental research project in the industrial area of Cubatao showed how scientific collaboration can increase competence in developing countries and simultaneously yield results useful for political and other authorities. Monitoring programmes were discussed in several contributions. Strategies for the sustainable management of the environment were discussed against the background of results from a university collaboration in the Baltic region.

Several poster sessions were also included in the programme, and altogether some 45 posters covering the same groups of topics as above were discussed.

In connection with the conference, a meeting was also held by the Red para Análisis Químicos Ambientales en América Latina (RAQAL). This is a network aiming at improving competence and confidence among its members, mainly by running rounds of intercalibration. Prof. Joseph Tarradellas (Lausanne, Switzerland) and Prof. Dieter Klockow (Dortmund, Germany) have acted as advisors to the network during its 10 years of existence. The network has completed several rounds to date and now felt ready to undertake the production and certification of a reference material. This will probably consist of black beans, be produced in Santiago de Chile and be analysed by the members.

As a whole, CHEMRAWN XI provided a good overview of the newest developments in Environmental Analytical Chemistry. It also fulfilled the purpose of giving Latin American attendees an opportunity to come

Prof. P. Moyna welcomes delegates to CHEMRAWN XI



into contact with colleagues from more developed countries, particularly in the non Spanish-speaking parts of the world.

Folke Ingman, May 1998

Statement of the CHEMRAWN XI Meeting and Recommendations of the Future Actions Committee (F. Ingman (IUPAC), W. Figueiredo (Sao Paulo), D. Klockow (Dortmund), P. Moyna (CHEMRAWN), A. Pohland (Washington) and L. Ryden (Stockholm)).

Introduction

On 15–20 March 1998, the CHEMRAWN XI Meeting at Montevideo, Uruguay, gathered specialists on environmental chemistry and environmental protection from 19 countries world-wide, 12 of them Latin American, to discuss the situation of the environment in Latin America, with particular reference to South America and the Rio de la Plata basin. The Conference was organized cooperatively by various groups in Montevideo, in particular the Universidad de Republica and the Intendencia Municipal de Montevideo, and several international institutions, most prominently the International Union for Pure and Applied Chemistry (IUPAC), the International Association of Environmental Analytical Chemistry (IAEAC), and the International Organization for Chemical Sciences in Development (IOCD).

The state of the environment in Latin America is deteriorating

The Conference concluded that the environment in Latin American countries is seriously and rapidly deteriorating as the heavy pollution of watercourses, land

degradation, and soil and air contamination continues. Available data, among the many reported to the Conference, pointed to serious emissions of heavy metals, toxic organic compounds and untreated sewage from cities, industries and agriculture. These emissions constitute not only a threat to individuals, public health and the living environment and its biodiversity, but also a considerable economic loss for the countries concerned, due to the misuse of natural resources and investments.

Urgent action requires reliable information

The situation calls for urgent action. Although many sources of pollution are obvious and should be addressed immediately, a more systematic approach is needed. Therefore, reliable data will be of fundamental importance.

Such data will be necessary for all kinds of environmental actions, be they legal actions, or economic sanctions such as taxation measures. Most importantly, they will be needed to trace the sources of environmental impact, understand its consequences on ecosystems, and constructively address the causes of pollution. Research laboratories are prepared to take responsibility for data collection. The Conference was pleased that the RAQAL network—Red de Análisis Químico Ambiental en America Latina—of analytical chemical laboratories in Latin America is prepared to contribute to the required effort. The RAQAL network, which has existed since 1990, was meeting as part of the Conference. It has secured international support to ensure that the required expertise, instrumentation and methodological developments will be available for carrying out the proper analysis of environmental samples. The analytical chemistry community is willing to work on, for example, sampling strategies and methodologies for the quality control of analytical results. This first basic step will ensure a sound platform for further action.



Participants at the RAQAL meeting held in conjunction with CHEMRAWN XI.

Monitoring programmes are urgently called for

The scientists at the Conference concluded that it is urgent that laboratories in the region address the question of a large scale monitoring programme to survey the environment. This will provide a base both for environmental research and for environmental protection measures. The design and execution of emerging monitoring programmes needs relevant competence both regarding environmental science, and chemical and biological analysis. Just as in other parts of the world, adequate scientific institutions, not the least universities, would be the natural platform for the development of such a programme, and scientists at the participating institutions in Latin American countries are prepared to contribute.

Regional co-operation is essential

Pollutants do not recognize national borders, and a successful environmental programme must adapt to this fact. A monitoring programme should thus be international. The participating scientists are prepared to seek regional co-operation. In the longer term, the governments in the region, in agreement with the results of the UN Conference of Rio de Janeiro, 1992, and the Agenda 21 document, should take responsibility both for environmental surveillance and proper action, in order to preserve their natural heritage and the long-term capacity for sustainable development through environmental protection.

Quality and interdisciplinarity are essential

Environmental data will serve no purpose if they are not related to their effect on the environment and on humans. A successful monitoring programme will have to rely on co-operation between many fields of science, such as chemistry, biology, ecology, medicine, geography and hydrology, amongst others. The arrangements for interdisciplinary co-operation should be addressed appropriately and solved.

A strategy is needed for optimal results

A monitoring programme should, in the first place, develop a proper sampling strategy to ensure that analytical efforts give meaningful and interpretable data. The chemicals to be measured should include not only toxic substances, such as heavy metals and organic pollutants, but also other substances present in amounts that are deleterious to the environment. It is particularly important to include nitrogen and phosphorus, as they cause the ongoing eutrophication of bodies of water from poorly treated or untreated sewage from urban ar-

reas, or as run-off from agricultural land and associated industries. This is particularly urgent in countries where agriculture is a mainstay of the economy.

Environmental impact is due to pollution of air, water, soil and food. All these sources need to be monitored. Samples should be taken not only in open air or water but also from biological samples. Adequate data on pollution of water needs analysis of benthic long-lived organisms and the fish fauna. This makes it possible to identify substances hazardous to humans via food, in particular, seafood and fish. Databases should be set up of the toxic substances found in different matrices such as sediments, organisms and water.

Biological monitoring will give essential information on the ecological effects of pollutants. Environmental transport and the fate of xenobiotic compounds in the specific environment in Latin America should be taken into consideration. A search for specific toxicological endpoints in the flora and fauna, as well as in the human population, including ethnic minorities with specific food habits, need to be addressed.

Monitoring water quality

The status of the water in the region should be monitored most urgently. Clean water for everyone is a prerequisite for the health of the population. Most pollutants are emitted directly into water or finally end up in the water as atmospheric precipitation. The environmental status of the water can be used directly, either to design treatment actions or to redesign water management in urban areas, industry and agriculture.

Monitoring air quality

The measurement of air pollution is already ongoing in several industrial centres such as Cubatao at Sao Paulo in Brazil, because of a successful international co-operation project. Such measurements need to be prolonged and extended to include further areas. Increased car traffic in the big cities is a special concern for air quality, and will in itself have serious effects on public health. Meteorological competence is essential for such a programme.

Natural regions for monitoring exist

Monitoring water needs to take into account the natural borders for waters, the drainage basins and catchments. To improve the situation of a watercourse, all pollution sources within the drainage basin must be addressed. Upstream sources will heavily influence the downstream situation. Therefore, water monitoring should be organized around catchment areas, and mechanisms for the required co-operation in such areas should be found. Meteorological conditions define ar-

eas that influence each other heavily through air-borne pollution.

Experiences from the world

The Swedish participants at the Conference contributed their experiences from a long-term international co-operation programme for the protection of the Baltic Sea environment. This includes, to the best of our knowledge, the longest running monitoring programme in existence today. The monitoring of pelagic and benthic systems has been running in the Baltic Sea for more than 40 years. This started as, and continues to be, a research programme, although today the governmental authorities are responsible for routine measurements. It has been of utmost importance for the present improvement of the Baltic marine environment. The programme has served as a model when organizing other monitoring programmes of regional sea basins. Such a programme is now being carried out in the Gulf of Thailand. Other relevant experiences exist in several regions, e.g. for the Rhine River on the European continent and the Great Lakes district in North America.

A change in the position of scientists in the region

The number of problems is apparently overwhelming, but it should be clear that these problems can only be solved if the scientists from the region itself are involved as the main actors. An important part of the decisions and activities have to be taken and generated within the Region, otherwise local groups will always be struggling to keep up with the latest proposals coming from abroad. This is why an important part of the future goals have to concentrate on the training of the scientists at present working in Latin America. More importantly, stress has to be placed on the education of a generation of chemists capable of working independently, of developing and validating the needed analytical techniques, of establishing and running regional networks, and who are capable of raising the needed financial support from local and international groups and institutions.