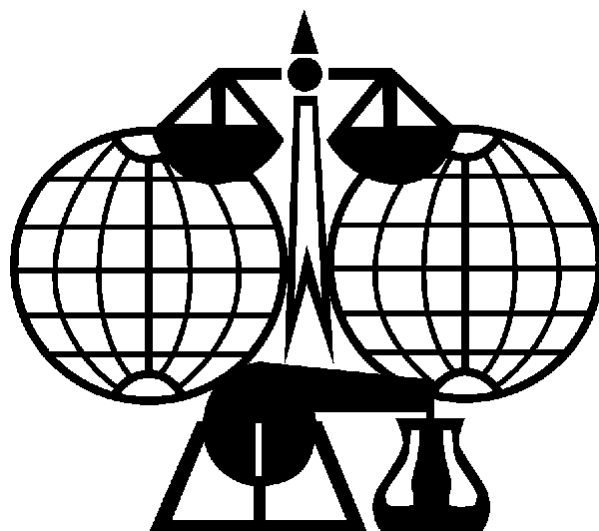


INTERNATIONAL UNION OF  
PURE AND APPLIED CHEMISTRY



**World Chemistry Leadership Meeting**

9 July 2001

Brisbane, Australia

Report



# World Chemistry Leadership Meeting

9 July 2001

Brisbane, Australia

Executive Summary

The World Chemistry Leadership Meeting (WCLM) was held on 9 July 2001 in Brisbane, Australia. The WCLM assembled the Presidents of national chemical societies, regional chemical federations, and leaders of chemical industry to discuss subjects of importance to the global chemistry community.

The WCLM was held in two sessions. The morning session was devoted to the single topic of *Sharing Responsibility for Our Science – Chemistry across National Boundaries*. IUPAC was requested to address this subject by a resolution of the meeting of chemical society presidents held in Berlin during the IUPAC General Assembly and Congress in 1999. This session summarized the major needs of the developing and economically disadvantaged countries and addressed how the chemical societies and trade associations in the developed countries planned, using the resources available to them, to work with related organizations to strengthen chemistry in those countries and to assist in their development. The afternoon session considered subjects of common interest to the assembled chemical societies and other representatives of the worldwide chemistry community.

The results of the discussion can be summarized in the following observations and points of agreement. The first fourteen points relate to developing countries, while the remaining four are applicable globally. The term developing country will be used in the rest of this executive summary to include the terms emerging economy, economically disadvantaged, less developed, and other terms used to divide the nations of the world into those that are economically well off and those that are not.

1. University staff in many developing countries are well trained, but the support infrastructure is inadequate.
2. Differences in the capabilities of institutions in a developing country are often large, with some at a level comparable to institutions in developed countries and others functioning at a quite rudimentary level.
3. The tendency of students from developing countries to remain in developed countries after finishing an advanced degree program is a significant problem (Brain Drain). The fundamental solution to this problem is an improvement of working conditions for young researchers in developing countries. Steps that can be taken to ameliorate this problem are programs to keep students in touch with their home countries; short postdoctoral fellowships; more emphasis on training in countries outside North America, Japan, and Europe; and more specialized training opportunities in developing countries provided by institutions in developed countries.
4. Free or low cost access to online resources—especially to major journals and databases—is vital to scientists in developing countries.
5. Information technology—especially access to computers and the internet—is vital to the participation of scientists in developing countries in the global scientific community.
6. Equipment donation needs to be well thought out. Donated equipment should be in good working order, and training of service personnel should be part of the

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- donation. Spare parts must be readily available. UNESCO has expressed a willingness to help expedite equipment delivery.
7. Government regulations in some developing countries need to be changed to facilitate donations of equipment.
  8. Donations should be made to institutions that can utilize the donated material. Chemical societies in developing countries should help guide donors to locate suitable institutions to receive donations.
  9. IUPAC should provide a central, online resource to collect information about programs operated by chemical societies and others in developed countries and about the capabilities of institutions in developing countries.
  10. Researchers in developing countries should concentrate on research that can benefit the local economy.
  11. Exchange programs for young scientists are important as are twinning programs, especially between departments, rather than between institutions.
  12. Industry should participate in exchange and training of scientists from developing countries. This relationship can be facilitated by the chemical societies in the developed countries.
  13. Major scientific conferences should be held in developing countries to help scientists from those countries to participate in the global chemistry enterprise.
  14. Areas of fruitful cooperation were identified, such as Green Chemistry and drug discovery based on local bioresources.
  15. The public image of science is a problem shared by developed and developing countries. Information about programs to address this problem should be shared so that chemical societies can learn from each other.
  16. Education of primary and secondary students should emphasize the enjoyable aspects of science rather than rote learning.
  17. Mutual recognition of degree programs and the certification of chemists are necessary to permit the free flow of scientists.
  18. The work of IUPAC to develop global standards for the practice of chemistry should be recognized by industry as vital to the health of chemistry.
  19. The role of IUPAC in many of the items mentioned above (especially items 9, 12, 15, 16, and 17) should be to act as both an international clearinghouse and coordination center. IUPAC should also act as an interface between industry and academia.

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## ***Introduction***

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The WCLM was held in two sessions. The morning session was devoted to the single topic of *Sharing Responsibility for Our Science – Chemistry across National Boundaries*. IUPAC was requested to address this subject by a resolution of the meeting of chemical society presidents held in Berlin during the IUPAC General Assembly and Congress in 1999. This session summarized the major needs of the developing and economically disadvantaged countries and addressed how the chemical societies and trade associations in the developed countries planned, using the resources available to them, to work with related organizations to strengthen chemistry in those countries and to assist in their development. As part of the preparation of a program for the morning session, IUPAC collected information from several chemical societies on their current programs to help chemistry in developing and economically disadvantaged countries. IUPAC also requested reports from chemical societies in developing and economically disadvantaged countries on the situation of chemistry in their countries.

The afternoon session considered subjects of common interest to the assembled chemical societies and other representatives of the worldwide chemistry community. This session was the traditional meeting of chemical society presidents held on the occasion of the IUPAC Congress and General Assembly. The Agenda included several topics that arose from discussions at previous meetings; additional subjects were also explored.

The Agenda for the meeting is shown in Attachment 1, and the list of attendees and their contact information is given in Attachment 26. The reports prepared by the participants before to the meeting are found in Attachments 2-25.

President Hayes opened the meeting by welcoming the delegates to Brisbane and thanking the Royal Australian Chemical Institute for helping to organize the meeting. He also thanked the University of Queensland for providing the historic Customs House as the venue of the meeting. President Hayes then reviewed the origins of the two meetings, as noted above. The purpose of both meetings is to allow an exchange of views and to answer the questions “What does the world chemistry community need?” and “Is this something IUPAC can help to achieve?”

## ***Discussion (Morning)***

The presentation by Prof. Busch, Past-President of the American Chemical Society featured a table entitled “What can ACS do in International?” The delegates felt that this was a useful summary of important points, and it was adopted as a reference point for the subsequent discussion. The table is reproduced below.

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### Possibilities that Probably Sound Easier than they Are.

1. Provide online literature to developing countries at nominal cost.
2. Help other chemical societies reach out to primary and secondary education.
3. Facilitate membership in ACS by chemists from developing countries.
4. Facilitate publication in ACS journals by chemists from developing countries.
5. Organize home country science support by immigrant scientist groups.
6. Promote major scientific events in developing countries.
7. Facilitate electronic communication with chemists in developing nations.
8. Provide educational materials in critical areas: e.g. safety, standards, secondary education, etc., possibly online.

The subsequent discussion touched on a number of topics, with different speakers returning to the same topic as well as introducing new ones. This report will not be a transcript of the discussion at the meeting, but rather a summary of the discussion organized around certain common themes.

### The Situation of Chemistry in the Developing Countries

A number of speakers reviewed the situation in African (sub—Saharan) Universities. The qualifications of the staff are often high with many of the faculty having been trained in major European and American universities; however, the infrastructure to support research is almost nonexistent. This situation leads to the very low publication rate observed in a number of studies (see the report of C. F. Garbers and the report of the Durban meeting of IUPAC and the African Association for Pure and Applied Chemistry, [http://www.iupac.org/news/archives/1998/chem\\_in\\_africa/index.html](http://www.iupac.org/news/archives/1998/chem_in_africa/index.html) and <http://www.iupac.org/news/archives/1998/durban/index.html>). The number of African Universities has grown from 11-20 in 1962 to ~100 at present. This growth has led to a spreading of the available resources very thinly across all universities, with a general decrease in the preparation of the students. The 1980s were an especially bad period for African universities, with dramatic declines in the available resources and deterioration of the infrastructure, such as libraries and laboratory facilities. The situation of many African universities continues to deteriorate, with almost a total lack of books and journals. This drawback leads to an environment that is hostile to research.

The research that is done has not benefited the local area; there is a disconnect between university research and the local economy. This discontinuity is attributed in part to the training received in European and American universities. It is difficult for faculty to carry out the same kind of research at an African university that was done at the school in which they received their training. New faculty have not been trained in how to carry out research that is appropriate to the needs of the local economy and compatible with the resources available. Much of this African scenario is also true of many countries in Asia.

The situation in South America is not as serious as in Africa, but a major problem is the split between the universities that offer good training using good equipment and many other universities that offer inferior training without access to good equipment. The situation in India is similar to that in South America, with a number of world—class institutes and a larger number of universities at a significantly lower level of capability.

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The situation in Russia was described as disordered rather than disadvantaged. Russian science is in a better situation than that of other former Soviet republics. The other former Soviet republics need to become more involved in the world science community. They have become isolated because so much of the interaction with the outside world was through Soviet institutions that were centered on Russia. Russia still has world—class training and facilities but the economic situation of scientists has deteriorated significantly. This decline has led to migration of many scientists to Europe and the United States. This problem, the so—called Brain Drain, was mentioned by many speakers as a problem for their countries and will be discussed in the next section of this report.

The situation in Eastern Europe is similar to that in Russia and continues to deteriorate. Much of the help provided is duplicative; there is a great need for better coordination of programs intended to assist scientists and institutions. This lack of coordination was seen as a problem in other countries in addition to those of Eastern Europe.

One specific IUPAC issue raised was that some developing countries feel marginalized in IUPAC. This apparent isolation is due to the lack of visibility of scientists from developing countries and the lack of funds to support National Representatives.

### **The Brain Drain**

The migration of scientists from developing countries to Europe and the United States was noted as a problem by many of the participants. This situation is especially serious with graduate students. The number of African graduate students in the US and Germany is greater than the total number of graduate students in Africa. The value of the loss of trained people was described as enormous both in terms of the lost investment in training and in the lost potential contribution to the home country economy. The solution to this problem is not simple. The migration of trained people cannot simply be prohibited; they must be encouraged to stay. This encouragement must come from improvement in local conditions. Most young scientists would like to return to their home countries but many see no future as practicing scientists for themselves if they return.

Postdoctoral fellows who receive their degrees in their home countries or other developing countries are more likely to return than are graduate students. This likelihood is probably due to the ability of students who have trained in a developing country to work using available resources. Students who study in certain countries(e.g. Israel) are more likely to return than those who train in Europe or the United States. This problem will go away only if the economic situation of scientists improves in developing countries.

A number of measures were suggested to mitigate this problem. These measures include travel grants for return visits; encouragement by the host institution of the repatriation of students; and bringing instruction to students. Universities in developing countries should select research areas that are especially pertinent to the local economy and then have the university encourage students to return. Leadership from both the universities and the local chemical societies is important. Once a program has been developed locally, IUPAC and chemical societies in Europe and the United States can then assist in its implementation. Local chemical societies should organize programs to train young

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scientists who have trained abroad in how to do research using local resources. Both the UK and the United States described programs that brought training to local scientists. This practice has the advantage both of keeping people in their home countries and in enabling more people to be trained. It is much less expensive to bring one or two experts to train a large number of people than to bring the same number to a location in Europe or the United States. The value of south—south cooperation in this context was noted and will be discussed in a later section of this report. Sri Lanka reported that they had had success with a graduateship program sponsored by the universities and the government. Students are sent to foreign universities for relatively short periods and are more likely to return. The importance of having a position waiting for students when they return was felt to be quite significant.

### **Infrastructure and Donations**

The research infrastructure at many universities in developing countries is very poor, and donations of books, journals, and equipment can be an important means of improving this situation. However, too many donations are not well thought out. The books donated are in many cases out of date, and the equipment is either not functional or requires access to spare parts that are difficult to obtain. Donated journals often do not provide a complete set so that holdings in many university libraries are incomplete. Donations of equipment should include a supply of parts and either service provided by the donor or training of local technicians so that equipment can be maintained in good working order. Too many pieces of equipment sit unused because of a lack of parts and service.

Government policy or regulations in some developing countries often hinder equipment donation. The fact that equipment donations are often made to governmental institutions and not to universities was seen as an issue in some countries.

Access to modern information technology, especially to computers and the Internet, is such a major issue that it will be discussed separately.

### **Exchange Programs and Related Concepts**

Programs to exchange scientists were seen as an important method for improving the capabilities of scientists in developing countries and in integrating them into the global community of scientists. The need for simple mechanisms for making scientists in developing countries aware of opportunities for participation in exchange programs was stressed. On the other side of this problem, the mechanisms for making universities in the developed countries aware of scientists who wish to participate must also be simplified. IUPAC and the chemical societies, both of the developed and developing countries, have potentially an important role to play in setting up such a simple mechanism. The chemical societies in the developed countries can coordinate the exchange programs in their countries while the chemical societies in the developing countries can screen applicants so that the universities in the developed countries have a pool of qualified applicants to consider. The involvement of industry in exchange programs is also important. As was mentioned above, university scientists in developing countries need to respond better to local needs when choosing their research. Time spent in an industrial laboratory can help in providing the background that will allow scientists to choose research topics that are relevant to the local economy.



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The twinning concept was mentioned by a number of speakers. While national twinning arrangements can be successful, the twinning of departments was seen as being more fruitful. The national chemical societies in the developing countries can assist these programs by identifying departments that have good research programs and can be active potential participants. The African Association for Pure and Applied Chemistry has developed a database of chemistry departments in Africa that is a useful resource for those interested in finding departments with which to twin. UNESCO is prepared to help in promoting twinning programs by providing travel grants. The program initiated by IUPAC in cooperation with UNESCO and the organizers of the IUPAC Congress to fund young scientists to participate in the IUPAC Congress was cited as a way to bring scientists from developing countries into contact with the global scientific community.

### **Information Technology**

Access to computers and especially the Internet is a vital part of modern science. The Internet enables scientists in any part of the world to become a part of the global community. The Internet provides not only communication but also access to information in a way that can transcend local limitations. Support is needed to improve computer infrastructure, not just computers, especially desktop computers, but also improved communications such as telephone lines and high speed Internet access.

A UNESCO project in cooperation with the International Organization for Chemistry in Development (IOCD) to donate used computers was cited as an example of a small, but successful, project. The IOCD arranged for the computers to be donated and UNESCO arranged and paid for their shipment to a suitable donor in Africa. The importance of making sure that the computers were in good working order and that the recipient was in position to utilize them was stressed.

The Japanese delegate described an initiative by the Science Council of Japan to develop a chemical information network for Asia. This network is being developed as part of the Asian Network for Publicity of Science and Technology (ANPST). ANPST is an activity of the Science Council of Asia that provides groups, educational organizations, schools, etc., with information about science and technology. This information is accumulated in ANPST in cooperation with academic societies and the industries. The chemical information network is being developed by the Federation of Asian Chemical Societies. The following pieces of information will be collected: 1) tables of contents and abstracts of journals published by the chemical societies of Asian countries, 2) links to internet services about chemical education, 3) announcement of international conferences held in Asian countries, 4) publication news, 5) patent information, and 6) directories of higher education and research opportunities, etc. If similar networks are developed by other regional chemical federations, they can eventually be linked to form a global chemical information network.

### **Regional and South—South Cooperation**

Regional and south–south cooperation was seen as an important aspect of improving the situation of chemistry in developing countries. As was mentioned above, training in a good university in a developing country can be more useful to a young researcher than training in a developed country. The Science Council of Asia is one example of regional

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cooperation. A proposed Arab Association of Pure and Applied Chemistry is another example, as is the African Association for Pure and Applied Chemistry. All of these initiatives are important, but they have yet to have much effect. Most universities in developing countries are still mainly oriented toward cooperation with institutions in developed countries. The training grants provided by IUPAC for chemists from developing countries to study at the Nehru Institute in India were cited as an example of the kind of program that should be expanded. The creation of the database of African chemistry departments by the AAPAC is a first step to promoting greater intraAfrica cooperation. A UNESCO program that sponsored 63 scientists at the postdoctoral level to study at the five institutions in the Cape area of South Africa is another example of regional cooperation in training that could be emulated elsewhere. A further example is the IOCD workshop held at the South African Institute of Chemistry conference; funding was provided by IUPAC and UNESCO to bring nine participants from subSaharan Africa.

The language barriers in Asia can be a problem for students wishing to study at another Asian university. Language schools have been set up in a number of Asian countries to help students come to Japan. The language problem is especially great in those countries that use writing systems that are not based on the roman alphabet. This background makes learning English, the standard language of science, more difficult.

The Egyptian delegate described new approaches to teaching chemistry for primary and secondary students as an example of how developing countries can learn from each other. Teaching methods that are suitable for developed countries are often inappropriate for schools in developing countries that have little access to equipment and materials. The long involvement of IUPAC, with funding from UNESCO, in developing low cost, small—scale equipment for use in developing countries was described. This program has been introduced in more than 30 countries in Africa, Eastern Europe, and the former Soviet Union. Workbooks and an instructional videotape are now available in English, French, and Arabic. Workbooks are also being prepared in Russian, Portuguese, Estonian, and Farsi, with the assistance of UNESCO.

### **Industrial Assistance**

Industry can help with developing and complying with environmental and safety laws. Means of increasing the involvement of industry in cooperation with local universities were seen as an important part of improving not only local compliance with international standards, but also of increasing the relevance of the work done in universities to the needs of the local economy. The work of the Crop Protection Association in developing a training program online was described. The site—specific nature of this training was emphasized.

### **Chemical Society Assistance**

A number of specific examples were cited of ways in which the chemical societies in developed countries might provide assistance. Free, or low—cost subscriptions to journals for scientists in developing countries was seen as significant contribution. This policy can be most easily and inexpensively be implemented through online access, perhaps with a delay of 12 months from the publication date. A reduced membership fee,

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at cost, for members from emerging countries is another possible contribution. The sponsorship of major scientific events in developing countries can greatly increase the integration of scientists from developing and emerging countries in the world scientific community.

Suggestions specific to IUPAC included the funding of the participation of National Representatives by IUPAC to participate in the work of IUPAC bodies. A regional IUPAC Prize for Young Scientists was proposed to improve the chances of scientists from developing countries to win an IUPAC Prize. Funding to bring members of non—IUPAC countries to attend IUPAC meetings was suggested. This program would be in addition to the funding provided for young scientists.

### Areas for Research Cooperation

Cooperation in certain research areas was seen as having high potential to benefit developing countries. The disposal of chemical weapons in the Middle East is a major unaddressed problem. The technology used in the developing countries is often too expensive and too complex to be applied in a developing country.

The recent controversy regarding AIDS drugs has highlighted the need to have local sources of generic drugs. This need is a problem not only for AIDS but also for many other public health problems in the developing world. A related area is the proper use of the biodiversity of developing countries to contribute to their economic development. IUPAC has taken the lead in creating guidelines for cooperation between groups in biorich developing countries and researchers in developed countries.

Green chemistry is another area where the development of new technology that is of not only low environmental impact but also based on local resources can contribute to the improvement of the local economy. The IUPAC program in green chemistry offers a mechanism to promote the cooperation of scientists in developed and developing countries in this important area.

### Summary of Morning Discussion

Dr. Hayes summarized the morning discussion by noting the following points:

1. The list of points made by Dr. Busch should be taken as given.
2. Point two of the list should be expanded to include tertiary education.
3. On—line access to literature should be made available to developing countries at a nominal cost.
4. The donation of equipment in good working order should be coordinated by the chemical societies.
5. Access to the Internet should be facilitated by the donation of “obsolete” computers.
6. More emerging countries should be encouraged to participate in IUPAC (an *ad hoc* committee has been set up with Prof. Ohtaki as chairman to address this issue).

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7. The “Brain Drain” is a problem that requires improvement in local conditions as well as special programs to encourage young scientists to return to their home countries.

### ***Discussion (Afternoon)***

#### **The Public Image of Science**

The public image of science is perceived as poor in most parts of the world, and the public image of chemistry is especially poor owing to its association in the public’s mind with environmental, health, and safety problems. This perception has developed over many years and will not be eliminated quickly. The delegates discussed initiatives in their countries that have been undertaken in response to this problem. A number of delegates commented on the need to have the collaboration of the chemical industry and chemical societies at all levels—national, regional, and global. Multinational companies need to be involved in all the countries in which they do business, not only in their home countries.

National Chemistry Week programs have been set up in a number of countries to publicize the beneficial aspects of chemistry to the public. Access to mass media, such as newspapers, magazines, and TV, can be important and effective, but is difficult to obtain. Chemical societies that want to gain access to the media must have a clear, coherent, and interesting story to tell. The delegates noted that there are many positive examples of the benefits to society of science in general and chemistry in particular. The presentation of these examples requires the cooperation of industry and chemical societies. In many countries, chemistry and chemicals are viewed favorably but industry is viewed unfavorably. Because most chemists work in industry, it is important to the chemical societies that this unfavorable view of the chemical industry be counteracted.

An area of special interest to many chemical societies is improving the image of chemistry with students. This effort must be undertaken in the early grades because impressions formed are difficult to change by the time students are in secondary schools or universities. Prof. Sydnes described an open house program at his university that used to focus on high school students; last year they invited sixth graders. This scenario helped not only with the students, but also with teachers and even attracted press attention. The need to put fun back into chemistry education was noted by some speakers. This goal is made difficult by rigid centrally dictated curricula in some countries. Prof. Iwamura described the efforts of the Chemical Society of Japan to overcome this problem by providing materials about chemistry to teachers for use in free time. The need to emphasize the role of chemistry as the central science was pointed out by a number of speakers, as was the tendency for chemistry to be neglected in favor of biological and environmental sciences. These subjects are too often taught with little understanding of the central role of chemistry in the modern practice of these sciences.

The provision of teaching materials is often seen as a way to help improve the image of chemistry with students, especially in the primary schools. However, this practice has led to a deluge of materials with which teachers are unable to cope. The poor preparation of primary school teachers in science is a problem. In fact, many primary school teachers are afraid of science and communicate this fear to students. Primary school students are

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often very interested in science but that interest can be destroyed by the inability of teachers to convey the excitement of science to their students. Coordination in this area among various scientific societies and industries is vital to prevent the loss of impact by overloading teachers with information. Efforts in this area would benefit greatly from a sharing of ideas among societies nationally and globally. IUPAC is prepared to help by acting as a clearinghouse of information on programs that have been successful and those that have been unsuccessful.

The Responsible Care initiative that has been adopted by many chemical industry associations, based on the example of first the Canadian and then the American chemical industries, can be the basis of a program to improve the public image of chemistry. Open house days at local plants are a part of this program and could be used by local chemical societies as part of their efforts in this area. Cooperation and coordination were again emphasized as being key factors in a successful program.

### **Certification**

The question of certification, both nationally and cross—border, was discussed by a number of speakers. In many countries, other professions have clear definitions of who can be a professional practitioner, but this is usually not the case with chemists. This situation was felt to lead to a devaluation of chemists and a lowering of their status with the public. Prof. Kebir described the efforts in Egypt to pass legislation defining who can be a chemist and what a chemist does. This problem is exacerbated when chemists move to another country. Academic and professional qualifications are often not transferable owing to a lack of common standards. The difficulty in making progress in this area was pointed out by noting that the Eurchem qualification has not been adopted by most European countries.

### **Standards**

The work by IUPAC to develop validated data and methods, as well as standard nomenclature and terminology, was seen as being of vital importance to the health of chemistry. The value of this work is often unappreciated by its beneficiaries, especially in industry. The new project driven system adopted by IUPAC is an attempt to make this work more responsive to the needs of the global chemistry community in general and to industry in particular. The national chemical societies have an important role to play in communicating the significance of these standards to industry and in making sure that IUPAC is working on problems that are seen as vital.

### **Cooperation of Chemical Societies**

Mr. Barnes of the Royal Australian Institute of Chemistry described the value of chemical societies cooperating in areas such as member recruitment and other society development activities (see attachment 4). The activities described above can only be accomplished by vital and active chemical societies. Programs to increase participation by chemists in their national societies are important to the well—being of those societies. He noted that it was important for societies to learn from each other and not only follow each other. He proposed that the first of what would be a regular series of meetings of

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chemical society Executive Directors be held as part of the next IUPAC Congress and General Assembly in Ottawa. He also proposed that regional meetings would be useful to enable chemical societies that do not have the funds to send someone to Ottawa to be involved. After a face—to—face meeting, a network of Executive Directors could be set up that communicated mostly by e-mail. The Federation of European Chemical Societies has taken steps in this direction by inviting the Executive Directors of the member societies to its last meeting.

### **Final Remarks**

Dr. Hayes thanked the delegates for their active participation in the meeting. The day's discussions had covered many topics and should provide many ideas for actions by the chemical societies and industry federations as well as for IUPAC. The role of IUPAC as a clearinghouse for information had been emphasized by many of the speakers and would be acted on by IUPAC. The next World Chemistry Leadership Meeting will be in Ottawa at the time of the IUPAC General Assembly, and will build on the work that has been accomplished today. It is hoped and expected that there will more industry representation at that meeting.

# **Attachments**

**World Chemistry Leadership Meeting  
9 July 2001  
Customs House, Brisbane, Australia  
Agenda**

**Session I: 9:00-12:30**

**1. WELCOME AND INTRODUCTION**

**DR. A. HAYES**

**2. HOW THE MAJOR CHEMICAL SOCIETIES AND IUPAC ARE CURRENTLY HELPING MEET THE NEEDS OF CHEMISTS IN DEVELOPING AND ECONOMICALLY DISADVANTAGED COUNTRIES**

- SUMMARY OF MATERIAL PROVIDED TO IUPAC [ENCLOSED]
- SHORT ORAL PRESENTATIONS TO HIGHLIGHT AND UPDATE THE WRITTEN MATERIAL

**3. NEEDS OF CHEMISTS IN DEVELOPING AND ECONOMICALLY DISADVANTAGED COUNTRIES**

- AREAS SUCH AS POST-DOCTORAL FELLOWSHIPS, VISITING PROFESSOR GRANTS, INDIVIDUAL RESEARCHER COLLABORATION/UNIVERSITY TO UNIVERSITY COLLABORATION, SHORT TERM TRAVEL GRANTS (LAB VISITS), LECTURE TOURS
- ACCESS TO PUBLICATIONS AND OTHER INFORMATION (ELECTRONIC AND PRINT)
- HELP WITH THE SAFE AND SUSTAINABLE DEVELOPMENT OF CHEMICAL INDUSTRY
- EQUIPMENT DONATIONS
- OTHER AREAS AMENABLE TO ASSISTANCE FROM CHEMICAL SOCIETIES AND TRADE ASSOCIATIONS

**4. ROUNDTABLE DISCUSSION**

- PROPOSALS FOR EXTENSION OF EXISTING PROGRAMS AND FOR NEW PROGRAMS
- PLANS FOR COORDINATED EFFORTS BY NATIONAL CHEMICAL SOCIETIES, REGIONAL CHEMISTRY FEDERATIONS, TRADE ASSOCIATIONS, AND IUPAC

**5. SUMMARY AND CONCLUSIONS**

**DR. A. HAYES**



**World Chemistry Leadership Meeting  
9 July 2001  
Customs House, Brisbane, Australia  
Agenda**

**Session II: 14:00 – 17:30**

**1. INTRODUCTION**

**DR. A. HAYES**

**2. THE PUBLIC IMAGE OF CHEMISTRY**

- USE OF TV AND THE WEB TO EDUCATE THE PUBLIC AND DEAL WITH CHEMOPHOBIA
- DEALING WITH GOVERNMENTS
- EDUCATION IN “CHEMISTRY AS THE CENTRAL SCIENCE”.
- THE ROLE OF IUPAC IN EXCHANGE OF INFORMATION

**3. NEED FOR INTERNATIONAL STANDARDS**

- NOMENCLATURE, QUALITY ASSURANCE, PURITY, SAFETY, METHOD VALIDATION
- ROLES OF IUPAC, NATIONAL CHEMICAL SOCIETIES, TRADE ASSOCIATIONS

**4. OTHER INTERACTIONS BETWEEN CHEMICAL SOCIETIES**

**5. SUMMARY AND CONCLUSIONS**

**DR. A. HAYES**

**Contribution from the  
African Association for Pure and Applied Chemistry**

**THE AAPAC'S CONTRIBUTION TO  
SHARING RESPONSIBILITY FOR CHEMISTRY  
IN THE POOREST CONTINENT**

The AAPAC have over the past two years :

- 1 Produced a database on chemistry departments at all Universities in Africa. This database highlights:
  - (a) the major equipment in use at each chemistry department
  - (b) the major research areas in each chemistry department
  - (c) the details of each faculty member – qualifications, research interests, research publications, etc.

The AAPAC sees:

- 2 the database (DB) as a way to encourage the movement of staff and students to centres of excellence and back to their own department, within Africa.
- 3 The DB as the main channel aid (books, equipment, visiting lecturers) to departments in need.
- 4 The DB as a way to create an atmosphere of African unity. This could springboard the African Renaissance in chemistry.
- 5 the DB as a way to encourage twinning of departments in Africa for mutual benefit.
- 6 The DB as a way to stop brain-drain to Europe and America.

The DB is in “access” and will allow for rapid searching. The DB today contains information of 101 Chemistry Departments in Africa. It is not yet complete but what we have will be available on the Web within a week or two.

Prof T M Letcher

8 May 2001

## Contribution from the Society of Albanian Chemists

### ON ALBANIA'S ENVIRONMENT AND ROLE OF THE CHEMISTS AND CHEMICAL ENGINEERS

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On behalf of the Society of Albanian Chemists, let me introduce our organization:

Society of the Albanian Chemists, through its hard work already done since its creation and restructuring happened last year, has reached fortunately membership of the IUPAC ( International Union of Pure and Applied Chemistry), membership of the Federation of the European Chemical Societies, Associate Membership of EURACHEM . Through all these memberships, Albanian scientists intend to actively participate in as much organized meetings, conferences and workshops, as we can contributing more and more directly to their success, because in my country it is growing a big ambitious and affinity for more contemporaneous knowledge and modern experience.

Up to now, we have been participating within the framework of all regional conferences of chemists organizations and associations such as our BENA ( Balkan Environmental Association), International Conferences of the South –East Countries Societies of Chemists, etc.

*The activities of the Society of Albanian Chemists are the following:*

- 1.To study and to identify the common or special environmental problems of our country and to suggest possible courses of action together with their economic effects.
- 2.To integrate the common efforts of scientists, specialists, educators and industrial enterprises for the environment and its sustainable development between Albania, Balkan countries, European Union and other countries.

The objective of the Society of Albanian Chemists as active member of B.EN.A. ( Balkan Environmental Association) are:

- 1.To bring together its members and other interested persons from scientific political or economical domains in order to examine the current problems of environmental protection in the region. They shall investigate solutions to these problems on regional, national and international basis. For this purpose we shall make a critical appraisal of the problems concerning the protection of man, animals and plants in the Balkan region from harmful effect of chemicals or climatic agents.
- 2.To give suggestions and recommendations concerning environmental quality and safety so as to enable the regulatory bodies of the various Balkan Countries to take proper decisions regarding the evaluation of the risk of chemicals and physical agents.

Generally, the state of the Albanian Environment is poor, in contrary of the naturally richness.

Some of important possible causes and triggers are as follows:

- History of isolation
- Legacy of central planning, level of production and price controls

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- Transition economy
- Low income levels
- High unemployment
- Weak institutions
- Under-managed private sector

### Albania's Environmental Conditions

#### ◆ Environmental Policy, Legislation and Institutions

- In 1993 was created Society of the Albanian Chemists;
- In 1993, National Environmental Agency was created,
- In 1999, Chemists and Chemical engineer's society was reconstructed and local branches have been established round my country,
- There are also other agencies and NGO's with environmental responsibilities
- Lack of public awareness

#### ◆ Natural Resources

- Albania is very rich in natural resources, but these resources are not used sustainably
- Forests are distributed all round national territory
- Water resources ( two big lakes and a lot of rivers)
- Soils
- Bio-diversity

#### ◆ Industrial Pollution

- In 1990, industry accounted for 58% of GDP
- It produced about 250 million m<sup>3</sup> /year of wastes
- Wastes were dumped randomly
- After 1990, industrial sector has declined but pollution continues, unabated
- Waste includes: arsenic salts, DDT, chromium compounds, mercury's salts etc.
- Air pollution exists near industrial areas, and in urban areas from heavy traffic in big cities of the country ( mostly is used diesel fuel).

*Economical development of the country, was accompanied with installation of factories and plants with old technology of processing natural properties, devoted to produce everything so called "with himself forces".*

As consequence of this wrong economical policy, over a long period of some decades, country has suffered from the environmental degradation and from a bad managing of natural sources. The Albanian coast near the populated centers, where were located old technology, had not any real possibility to get rid of these negative effects.

For many years have been discharged into environment and rivers solid wastes, effluents and gases, easily transferred to ground waters and to the atmospheric surrounding.

Now about 70% of industrial activity in Albania is not in function, but the traces of environmental impact brought about by the industry, are still considerable. The aggravated situation came as a result of the waste and ex-intermediate products as

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industrial deposit accumulated over years, which has forcefully contaminated the land and running waters, as well.

Nowadays, our country is playing an important role, within the framework of the international agreements and convents concerning the environmental protection of the cultural heritage and natural richness, and has taken such measures directed to the improvement of the nature protection, biological diversity and managing of wastes. He is actively participated in the action plan for the Mediterranean countries and in this way he is hardly working for the stability development of coastal zones and tourism.

### ◆ Urban Environment

- Internal migration has led to informal settlements
- Public services are inadequate
- Lack of solid waste management and waste water treatment leads to health hazards

### ◆ Coastal Zone Management

- Spectacular coast has tourism potential
- Uncontrolled urban developments, lack of solid waster and waste water management, and soil erosion threaten this potential

The Albanian coastal border, is 476 km long or 43.5% of borderline. This coastline is sand-formed of 70 % and 30% is rocky one. It is wetted from the Adriatic and Ionian sea in the western side of the country, and with north-southern spread. While, coastal zone touch about 7000 km<sup>2</sup> or 25% of total area of the country.

Albanian coast is highly evaluated for tourism development projects, but there exists some possible risks from the industrial pollutants and some measures needs to be taken to minimize the environmental pollution of the area .

Reach diversity of the coastal habitats, great gulfs, sea-ports and caves, have been witness of a natural irreplaceable source for the people, from the ancient historical population and specially since ilirian tribes decided to live here, 3000 years ago.

Albanian coast characterized by three types: river estuaries, sandy beaches and little rocky shore on south side. The contrast between natural properties and those created by people, such as coastal mountains, rivers, dales and forests, canyons, traditional villages that settle along the coast which reached with cultural and archeological inheritance and highly international evaluated, doing this coast a panoramic paradise for the tourists. This is so truly fact, as it is included in the classification of coasts as touristic zones, and specially, south part of Albanian coast is indicated as one of the ten most beautiful coasts in the world.

### ◆ Kosovo Crisis

- Led to localized environmental damage
- Waste accumulation
- Water pollution
- Soil erosion

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- Destruction of arable land
- Destruction of forests and other natural habitats

### Recycling of the solid waste disposed from the treatment of the minerals in Albania

Albania is considered one of the European countries, with biggest reserve of the chrome minerals. During extraction and its treatment, due to the very old technology being employed, used to be discharged an enormous quantity of the solid residues, so called “sterile”.

Sterile represents an amount of 50-60% of the chromium ore having been extracted from the mine. Considering that yearly production of the extraction process, reaches an average of 1.000.000 tons of mineral, it is clear that amount of solid waste being collected, is very high.

There is no doubt, we have a strong impact on the surrounding environment which is very dangerous ecologically.

It has been studied possibility of transformation and even recovery, of the sterile, to obtain useful products.

Industrial wastes created, have been chemically analyzed, and results showed clearly that they represent a good contingent to be used as raw material or as additive, producing some useful materials. Special (phase) analysis of this industrial waste, showed a complex chemical composition, having as constituent such kind of minerals, like: serpentine, forsterite, magnezo-chromite, and magnezo-ferrite.

### FOREIGN INSTITUTIONS INVOLVEMENT IN ALBANIA'S ENVIRONMENT

- Current Activities

- Institutional capacity building: *National Environmental Project Update*
- Forestry and community based natural resource management: *Forestry Project*
- Urban and coastal land use planning and management: *Urban Land Management Project*
- Regional environmental initiatives: *Lake Ohrid GEF Project*

- Future Activities

- Coastal zone management (Saranda): *Community Works, Urgent Water Supply Rehabilitation, Municipal Water and Waste Water Projects*
  - Community-based natural resource management: *Fisheries Development Project*
  - Community-driven development: *Albania is a pilot country*
  - Environmental safeguard policies
- Stability Pact for Southeastern Europe
  - Assistance will be selective and coordinated with the donor community.
  - Co-financing and replication are desired.

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### **STABILITY PACT FOR SOUTHEASTERN EUROPE (SEE)**

- Aims to promote peace, stability and prosperity
- Recognizes urban pollution, natural resource management and coastal zone management as environmental priorities
- Calls for SEE countries to:
  - initiate domestic structural reforms
  - collaborate economically/politically
  - develop open democratic societies
  - foster social inclusiveness
  - improve governance and domestic security
  - combat corruption

### **DONOR COORDINATION IN ALBANIA**

- During 1993-99, 38 million ECU was spent by donors on projects in the environment sector
- Emphasis has been on technical assistance and studies
- But, inadequate tangible and long-term results were achieved on the ground
- There is a lack of a coherent strategy or common vision
- Inadequate exchange of information, and experience
- Duplication of efforts
- Better communication and coordination among the donors as well as between the donor and the government are needed

### **IMPROVING DONOR COORDINATION**

- Friends of Albania as an umbrella or focal point
- Regular donor meetings to discuss the environment sector
- Development of an environmental agenda for the donor community within the framework of the Stability Pact
- Involvement in the design and implementation of the Poverty Reduction Strategy as partners
- Establishment of a mechanism to collect, update and disseminate information on donor, government, civil society activities in the environment sector

Recently, we have successfully held First Scientific National Conference on Chemistry, Industry and Environment. It was biggest event of the Chemists and chemical engineers of my country, presented with a lot of works from the mentioned field.

Finally, let's speak together with the same language, improving surrounding environment, neglecting political borders of our countries, being deeply engaged in solving together the same problems, and hopefully, feel the same happiness for a safer and clearer future.

## Contribution from the Royal Australian Institute of Chemistry

### Synergies from cross-fertilisations

One of the principal benefits from meetings such as these is that we all learn from the experiences of others. We can avoid treading on the same minefields because of the lessons learnt by others we can prevent or reduce the multiple re-invention of the wheel by hearing the wisdom of those who have already tried and succeeded (or failed) and we can all save valuable time by following the successful strategies of others and avoiding the pitfalls already experienced by others. In short, where we are not competing in the same marketplace, we can all learn and benefit from the involvement of those in similar organisations, which have similar problems and obstacles.

This scenario well fits the world of professional chemical organisations, whether they be an institute, society or association. We generally have the same broad aims and objectives; namely to advance the cause of chemistry by raising the professional standards of chemists and promoting the value and importance of chemistry to the community and our respective governments.

The lessons to be learnt and the benefits gained by exchanging views, practices (successful or otherwise) and ideas is already well known and recognised by other professional associations. For example, Institutes of Bankers and Societies of Accountants world wide meet every second year, while regional groupings (e.g. south east Asia) usually meet in the intervening year to (a) discuss common issues from a regional basis, (b) allow participation by those associations which cannot afford the cost of travelling outside the region.

Having had experience in both areas, first as Director of Education and Professional Development with the Australian Society of Accountants and then as Executive Director of the Australian Institute of Bankers, I have seen first hand the benefits to be had by working with and networking with fellow associations.

It is useful and timesaving to learn if your idea has already been tried by someone else or to discuss new or different methods of tackling common challenges which others have tried with success or failure. We can all learn from the lessons and examples of others. The following specific areas of our activities could materially benefit from such cross-pollination of information and ideas.

#### 1/ Membership Levels Compared With Potential

What is each association's present level of membership as a percentage of total potential? What is a reasonable and realistic (but at the higher end of the envelope) target? What is an achievable time frame for this goal? What is the experience of comparable professional chemical bodies? By comparing this information, we shall get a picture of what targets or goals we should set ourselves, or review existing targets in the light of these details.

What are the formulae or assumptions used to establish a total potential membership level? Is one formula better than another? If different criteria are used, are we then comparing apples with oranges when comparing our results in the future? What is a fair goal of membership level? What factors might cause one institute to decide on 50% of potential as against another society which sets 75%? What issues may influence one organisation to set a four year period to achieve target while another decides on six years or three years?

All of the above would provide useful background data when each Institute is assessing its own membership growth strategies.

#### 2/ Membership Marketing Strategies And Techniques

What are comparable associations actively doing to increase their membership? What ideas have worked and as importantly, have not worked? What percentage of benefits and labour are devoted to membership recruitment? How many bodies actually have a membership policy or strategy? How many associations know what to do about it?



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Do those with a policy actively target the chemist directly or through employers? How do associations identify where their targets actually are? What range of incentives do associations offer chemists to join? Professional and/or financial? Have associations sought external marketing assistance or do they go it alone and devise their own strategies? What internal marketing experience do societies possess? Or are they groping in the dark?

As membership is the fundamental platform for most associations existence and prosperity, how much focus and attention is given to this, as opposed to 'safer' areas which are non-threatening? How much sales and marketing expertise (as opposed to R&D or education) does each Institute possess? Where would associations rate membership recruitment in their list of priorities and how much attention and money is allocated accordingly? Do the two 'listings' (priority listing and funds allocation) match up?

What supporting material is available to assist in membership recruitment? Are the brochures or pamphlets focussed or 'feel good'? How often are they reviewed and by whom? Does the association have a membership marketing committee with appropriate expertise included, or is there someone within the society office with marketing experience?

If your association's membership is slipping, what are you doing about it in a logical and structured manner? Who is monitoring the corrective action being taken?

These and other questions are of fundamental interest to all professional associations and a comparison of notes on these issues can only provide us all with either new ideas or areas to avoid. Time is saved by needless re-inventions of actin plans plus knowledge gained by all from the experiences of others. We are not competing with each other so there is mutual gain to be had by all involved in the discussions.

### **3/ Providing Members With What They Want**

Do we really know what our members' needs and wants are - or do we merely *think* we know? How many bodies have surveyed their members recently to discover what they wanted or expected from their professional association?

Do we know what members want regarding professional development or continuing education activities, the content, appearance and frequency of the association's journal or magazine, financial incentives (discounts on loans and mortgages, car and telephone purchases, car rentals, insurance, etc.) and other services that the association may offer. What other benefits of membership do members want? Have we asked them?

When did you last review the range of membership benefits of your organisation? Are they spelt out clearly to members? How well are they known by members?

It is very difficult to draw up an action plan before knowing what the target market wants. Six or ten elected or appointed representatives sitting around a table may not always have a current or deep grasp about what some hundred's or even thousand's of chemists would like from their professional representative.

Members often need guidance (as opposed to direction) as to what might be available to them, and affordable, by way of incentives to join and stay. How often should membership surveys be conducted? What sort of survey generally brings out the most comprehensive responses? Must it include a stamped envelope for return? Can we ultimately conduct surveys via the net? What are the costs of surveying members? The expenses of those bodies which have surveyed their members lately would be of great benefit to all others. How the survey form was designed, the topics covered, how the questions were placed, how the survey was marked or assessed, the number sent out compared to those received back, the total cost and the results.

### **4/ Financial And Structural Management Issues And Challenges**

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How well are we managing our finances? What impact on our budget would an extra 500, 1000, 2000 or 4000 members have? What are the financial management and planning issues that are common to all societies?

With new members harder to recruit these days, how are we containing costs? What can we learn from kindred bodies as we all struggle to balance our books?

What is the legal structure of other professional associations? Are they registered, incorporated or commercial companies? Can they own property and sue and be sued? What is the liability of directors and members if the organisation becomes insolvent or the Treasurer flees to Bermuda with the funds?

How are various associations structured from a reporting and accountability viewpoint? Are the reporting systems working properly? Could they be streamlined, modernised or improved. What is best or current practice for Board or Committee meetings? Telephone and video hook-ups are cost saving, but are these meetings as effective as a physical meeting or are the cost savings worthwhile? What is a reasonable frequency for committee/board meetings? What is the balance that matches cost versus frequency? How do we value the benefits of one-on-one meetings which allow networking, casual conversations and 'getting to know' fellow committee members, as against the more formal, less networking atmosphere of hook-ups?

What sort of staff training are we encouraging? What skills do various not for profit associations look for when recruiting staff? How is staff performance measured in not for profit bodies? What performance assessment and reward systems have other associations adopted?

These are issues of vital importance to us all. Knowledge of other body's practices can help us improve our own.

### **5/ Professional Qualifications - Importance (And Reciprocity)**

What are other kindred associations doing to promote the value and importance of professional qualifications (in addition to academic qualifications)? Who would be the target markets?

The three target markets would be (i) the chemist; (ii) the employers - to recognise, prefer and reward the additional qualification; (iii) the community - to recognise the value of professionally qualified chemists.

The professional award is of diminished value if not recognised and accepted by the employer at (a) appointment; (b) promotion; and (c) pay rise time.

What are other bodies doing to publicise their professional rewards? There are important lessons to be learnt from the successes of other industry bodies in championing their professional qualifications. No-one else will do it for them.

Is it possible to register the word 'chemist' in other countries (like surveyors, registered nurse or dentist), so that only those suitably qualified (academically and professionally) can call themselves chemists? Has this been attempted elsewhere. If it has failed, why? If it has succeeded, what have been the requirements and implications? Is it worth exploring the possibility of reciprocal recognition of professional qualifications where the standards required are generally comparable? Would this be an attraction to becoming professionally qualified?

### **6/ Professional Development Activities (PDA)**

What sort of PDA's has each society found to be more or less popular or better attended? One hour lecture after work, t/2 or one day seminars, short courses or t - 2 day symposia? How important are the networking opportunities on top of the technical content? Who are usually the better speakers? Who chooses the topics? How are they advertised? How are they structured? Who runs them? What sort of numbers attend? What is the mix of networking and lecturing? Do you see the day coming when retaining ones professional qualifications

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will entail completing 'X' hours of continuing professional development (CPD) per year? (This already applies in other areas, e.g. accounting). Are employers encouraged to support their chemists' CPD requirements with time off work or payment of the attendance fee?

When are these PDA's held?

What sort of income is derived for the society from these PDA's? Can they be run in-house or should they be sub-contracted out? If the latter, how are standards of content and delivery monitored? Is a register kept of PD hours attended by members?

From section three above, do we know what PD topics and formats members prefer? Does the association underwrite or subsidise them in any way? Are they only open to association members or can others attend? If so, is there a non-members loading on the registration fee? What is the loading in % terms?

Is there value in linking with a university or college in organising and delivery PDAs?

These are only some of the PDA issues needing exploration with associations.

### 7/ Association Publications - Educational Or Promotional?

Most professional associations have a newsletter, circular, magazine or journal distributed to members. What has been other body's experience on the best 'mix' of technical versus non-technical content? Have others had trouble securing articles? Is a highly technical, refereed journal better than a magazine with more 'newsy' stories or contributions? Should it contain a combination of both i.e. a 'newsy' section and a more highly technical section?

How difficult is it to get stories or articles from society branches, groups, sections or divisions on society activities? Do you have a register of new members in each edition? Is your publication in colour and what grade of paper is used? What does the publication cost each member per year, i.e. what percentage of the annual subscription does it involve? How often is it published - monthly, bi-monthly, quarterly? Could it be produced more cheaply without detracting from its appeal? Is it cost effective? Is it financially self supporting? What fraction of the total cost is off-set by advertising or other revenue? What type of company advertises in the publication these days?

Is it 'member friendly'? When was the last survey on members' wants and expectations? How do you cover the varied interests and specialisations of chemists? Do members feel their interests are being covered? To what extent is the publication used to attract new members? How effective is it as a 'flag piece' or 'voice' of the association? Does it satisfy their needs? How could it improve?

What other publications (brochures, pamphlets, newsletters) are produced?

Once again, discussions on the experience of others relating to these and other aspects of associations' publications can be of benefit to all. No doubt these discussions would stimulate additional issues of common interest and concern.

### 8/ Public Relations

How do other institutes/societies utilise public relations to promote or defend chemists and the cause of chemistry? Do you respond to media issues relating to chemists or chemistry? If so, how effective have we been and how could we improve? Who writes the articles, releases or letters? Who signs them?

PR is an effective marketing tool when used judiciously. How effectively is it being used? Are others using it and how?

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The above issues are ones which effect most professional associations. As we are not competing with each other, there is nothing to be lost by sharing experiences and views. Comparing successes and failures can only assist all and harm none.

Exchanging ideas reduces the potential to repeat or re-invent and saves both time and money. By understanding how others have tackled similar problems, all professional associations can more quickly enhance their position and image, by avoiding pitfalls and concentrating on ideas that have worked elsewhere. Such industry-wide synergies can only strengthen our ability to better service our members and more effectively represent their interests and that of the chemical industry.

### **What Next?**

If the issues raised are considered important enough to pursue, it is proposed that a working party of say q - 5 associations be formed to meet electronically to discuss in further detail the logistics and practicalities of a meeting to take place.

Should we start with regional meetings first? How many associations would be willing to participate?

There is no doubt that, judging by the experience in other professional fields, such crosspollination meetings will result in all chemical professional associations becoming stronger, larger, more influential, more relevant and more effective.

## Contribution from the Bangladesh Chemical Society

### A Brief Introduction of Bangladesh Chemical Society

Bangladesh Chemical Society (BCS) was first organized in 1972 as a learned Society. Late Professor M. H. Khundkar (DU), Late Professor Mofizuddin Ahmed (DU), Professor Kazi A. Latif (RU), Late Professor A. Q. Chowdhury (BUET), Professor A. K. Shamsuddin Ahmed (CU), Professor S. Z. Haider (DU), Late Professor M. A. Nawab (DU), Late Professor A. Jabbar Mian (DU), Professor S. S. M. A. Khorasani (DU), Dr. Erfan Ali (BCSIR) and Dr. Abdur Rahman (BCSIR) were the main persons behind this venture. Later on, the Society was organized in the industries and other establishments. By now, the Society has achieved a truly national character by spreading its organizational activities in different parts of Bangladesh and it has become the vehicle of hopes and aspiration of all the Chemists and Chemical Technologists of the country.

Bangladesh Chemical Society, a non-governmental, non-political national organization of professional chemists, is dedicated to improve the quality of chemical education and research, industrial and technological output and overall well being of the chemists and chemical technologists of Bangladesh. According to a conservative estimate, there are about 25000 chemists working in various national organizations including (a) educational institutions like the universities, colleges and schools, (b) research establishments like Bangladesh Council of Scientific and Industrial Research (BCSIR), Bangladesh Atomic Energy Commission (AEC), Bangladesh Jute Research Institute (BJRI), Housing & Building Research Institute (HBRI), Bangladesh Forest Research Institute (FRI) and (c) Research and Analytical Laboratories of WASA, WAPDA, PDB, BSTI, BSRI, Defence Science Organization, Department of Environment (DOE), Geological Survey of Bangladesh, National Museum, Pharmaceutical Laboratories, Hospitals etc., and in all the industries for production of drugs and medicines, fertilizers, paper and pulp, newsprint, plastics, glass, rubber, insecticides, synthetic fibre, cement, oils and fats, sugar and distilleries, industrial solvents, dyes and paints, petrochemicals, basic chemicals like chlorine, sulphuric acid, caustic soda, nitric acid etc., products of daily use such as ink, cosmetic, soaps and detergents. The fields for which the chemists are mainly responsible are process control and operation, quality control of raw materials and finished products, planning, research, development and innovation, monitoring of industrial water management, control of environmental pollution and, material and inventory control.

BCS is run by a 32 member Executive Committee (22 elected and 10 ex-officio, President of Regional Committee). Science graduates with Chemistry having 3 years of professional experience, graduates in Chemical Engineering and postgraduates in Chemistry, Applied Chemistry, Bio-chemistry, Pharmaceutical and other chemistry related fields are eligible for membership of the Society.

The Society holds annual conference, lectures, seminars, symposia and workshop on topics of industrial, educational and professional interest regularly. For the last several years, BCS has actively pursued various nations building activities particularly in the

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fields of education, research and industrial development. These activities have established BCS as the leading learned and professional body of the country.

The main aims and objectives of the Society are as follows:

To promote, expand, improve the standard of education and research in chemistry, chemical technology and related fields throughout Bangladesh.

To safeguard the interests and prestige of the working chemists in different industries and institutions.

To promote coordination, interactions and collaborations among universities and research organizations and industries in Bangladesh and those of other countries.

To spread the knowledge of chemistry and its applications by publishing articles, reports, periodicals, journals etc.

To organize conferences, seminars and symposia, lectures and workshops on problems of national and professional interest.

To help develop laboratory facilities for analytical and instrumental analyses in all the Chemistry and Applied Chemistry Departments of the universities and colleges, in the research institutions and industrial establishments.

To institute awards for significant contribution in education and research in chemistry and chemical technology in the development and management of chemical industries.

To institute fellowships to support selected research projects for higher degrees.

To establish a library of the Society in which books, journals, magazines and reference materials in the field of chemical sciences are collected and made available to the members and other interested persons.

To cooperate with various governmental and non-governmental agencies, departments, chemical and pharmaceutical industries and offer advice and consultation services.

To ensure quality control in various chemical and pharmaceutical industries and offer advice and consultancy services.

To ensure quality control in various chemical and pharmaceutical process industries.

To help the establishment of the more chemical and industries in both public and private sectors.

To encourage and help the entrepreneurs to establish chemical industries based on local raw materials and indigenous technology.

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To encourage and help research projects in chemical sciences, particularly that relevant to the needs of our inventions, innovations, adoptions of appropriate chemical technologies, processes and products.

To arrange and effect contractual research with sector corporations, private enterprises, government departments and foreign agencies.

To establish a charter of rights for the professional chemists working in chemical and pharmaceutical industries.

To offer advisory services to the younger chemists for job opportunities and to the more senior chemists for consultancy work.

To improve professional qualifications, competence, skill and efficiency of those who practice chemistry and all other branches related to chemistry as a profession, through application oriented short courses and other programmes.

To create and expand opportunities for higher studies and training at home and abroad for the professional chemists.

To maintain the dignity and welfare of the members of the Society in the field of health, safety, environment and community development.

To cooperate with other learned and professional societies at home and abroad with similar aims and objectives for national and regional development.

To plan, organize and implement any other programme/programmes that would serve the interests of the Society and its members.

### **Activities of the BCS at a glance**

1. The Society holds lectures, seminars, symposia and workshop more or less regularly on topics of industrial, educational and professional interest. During the last 15 years, the Society has organized 18 national symposia/seminars on the following topics:
  - i. Utilization of industrial wastes, held at the Zia Fertilizer Co. Ltd., Ashuganj on 02 May, 1985.
  - ii. Chemical education, held at Jahangirnagar University, Savar on 07 September, 1985.

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- iii. Alternative and newer uses of jute fibre and stick, held at the Bangladesh Jute Research Institute, Dhaka on 31 October, 1985.
- iv. Alternative sources of energy, held at the Shilpakala Academy, Dhaka on 15 January, 1986.
- v. Local production of chemicals used in industry as import substitute, held at Urea Fertilizer Factory Ltd., Ghorasal on 07 August, 1986.
- vi. Chemistry in national development, held at the Shishu Academy, Dhaka on 12 March, 1987.
- vii. Problems of professional chemists, held at the Shishu Academy, Dhaka on 12 March, 1987.
- viii. Chemistry in industrial development, held at the BCIC Bhaban, Dhaka on 10 March, 1988.
- ix. Chemistry education and industrial development, held at the BCIC Bhaban, Dhaka on 10 March, 1989.
- x. Prospects of small-scale chemical industries in Bangladesh, held at the BCIC Bhaban, Dhaka on 22 July, 1989.
- xi. Chemistry in Agriculture, held at the Bangladesh Engineers Institution, Dhaka on 03 March, 1990.
- xii. National seminar on protection of environment of fertilizer industries and workshop on environmental chemistry priorities in Bangladesh, held at Urea Fertilizer Factory Ltd., Ghorasal on 25 July, 1990.
- xiii. Chemical research in developing countries: problems and prospects, held at the BCIC Bhaban, Dhaka on 13-15 December, 1991.
- xiv. Effects of agrochemical on the environment, held at the BCIC Bhaban, Dhaka on 19 July, 1992.
- xv. Role of chemists in developing countries, held at the BCIC Bhaban, Dhaka on 09 April, 1993.
- xvi. Problems and prospects of glass and ceramic industries of Bangladesh, held at the BCSIR, Dhaka on 04 November, 1993.
- xvii. Workshop on industrial productivity, held under the auspices of ICCT at the Seminar Room of the IFST, BCSIR, Dhaka from 24-30 June, 1994.
- xviii. Workshop on water quality, water treatment and water management for chemical and pharmaceutical industries and domestic uses, held at the Department of Chemistry, Khundkar Biggan Bhaban, Dhaka University, Dhaka from 07-12 January, 1995.
- xix. Seminar on mixed fertilizers: prospects and uses in Bangladesh, held at the BCIC Seminar Room, BCIC Bhaban, Dhaka on 25 November, 1995.
- xx. Workshop on development of the production quality grade cosmetics and toiletries in Bangladesh, held at the IFST Seminar Room, BCSIR, Dhaka, on 09-10 August, 1996.
- xxi. Workshop on water quality for drinking, industrial, pharmaceutical, agricultural and fisheries uses.
- xxii. Seminar on pollution problems of Dhaka City, held at the BARC Auditorium, Farmgate, Dhaka on 27-28 September, 1997.
- xiii. Seminar on free market economy and industrialization of Bangladesh, held at the BCIC Auditorium, 30-31 Dilkusha C/A, Dhaka on 22nd October, 1998.



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- xiv. Seminar on problems and prospects of sugar industries of Bangladesh, held at the BCIC Auditorium, 30-31 Dilkusha C/A, Dhaka on 15th July, 2000.
2. The Society has also participated in organizing/sponsoring the following symposia and workshop of national/international nature in cooperation with other national and international organizations (Science and Technology Division, Government of Bangladesh; UNESCO; CSC; CREN; University of Dhaka and BCIC).
    - i. Water analysis and processing for industrial, municipal, irrigation uses, held at the Department of Chemistry, Dhaka University, Dhaka from 21-31 December, 1987.
    - ii. Chemistry and technology of fertilizer industry, held at the Department of Chemistry, Dhaka University, Dhaka from 21 December '86 to 01 January 1987.
    - iii. Monitoring of Environment Systems of Chemical Industries in Bangladesh, held at the BCIC Auditorium, BCIC Bhaban, Dhaka and Zia Fertilizer Co. Ltd., Ashuganj from 30 January to 04 February, 1988.
    - iv. Locally Produced Low-cost Equipment for Chemical Education, held at Department of Chemistry, Dhaka University, Dhaka during 03-09 June, 1989.
    - v. Safety in Chemical Industries and Environmental Protection, held at the Geothe Institute, Dhaka, in 1991.
    - vi. Regional Workshop on Environmental Impacts from Fertilizers, Agrochemical and Industrial Wastes, held at the Hotel Purbani, Dhaka during 24-26 January, 1993.
    - vii. Short-term Training Programme on Water Quality, Water Treatment and Water Conditioning for Chemicals and Pharmaceutical Industries, held at Dhaka during 08-13 May, 1993.
    - viii. Seminar on Problems and Prospects of Glass and Ceramic Industries of Bangladesh, held at BCSIR, Dhaka on 04 November, 1993.
    - ix. Short-term Training Course of Food Processing and Preservation, held in, Dhaka during 13-18 November, 1993.
  3. The Society holds Annual Conferences of international character at which the results of research activities of the chemists and chemical technologists from home and abroad are presented and discussed. This year the Society is organizing the 23rd Annual Conference at the BCIC Auditorium, BCIC Bhaban, Dilkusha C/A, Dhaka during 26-28 January, 2001. The theme of the Conference is the "Arsenic Problems in Bangladesh: Sources and Remedial Measures". Distinguished chemists from different universities, research organizations and industries from home and abroad are participating in the Conference.
  4. The Society publishes a quarterly "News Bulletin", a half-yearly popular magazine (in Bengali) - the "Rashayan" and a half-yearly research journal - "Journal of the Bangladesh Chemical Society" and the proceedings of various conferences and symposia organized by the Society.
  5. The Society has prepared a permanent register of all its members. A Directory of Chemists of Bangladesh is being prepared.
  6. The BCS had prepared a preliminary list of the chemical industries in Bangladesh. A list of the pharmaceutical industries of Bangladesh is under process.

## Contribution from the Bangladesh Chemical Society

7. A BCS pool of experts had been formed which will render all sorts of consultative and advisory services to the public and private sectors for the development and expansion of chemical industries of Bangladesh.
8. The Society has prepared a list of facilities for chemical research in Bangladesh.
9. The Society has completed a study for effecting contractual research with sector corporations and other departments in order to solve some selected industrial problems.
10. The BCS has established a national “Institute of Chemists and Chemical Technologists (ICCT)” to offer appropriate courses and training to working chemists in order to update and improve their professional knowledge, skillness and efficiency.
11. A BCS Sub-committee has completed a study on the existing chemistry curricula at various educational levels to suggest measures for updating and restructuring the curricula in order to that the chemistry education may serve the needs of the industry and the society.
12. The organizational activities of the BCS have been extended to many institutions/ establishments in distant parts of the country. Regional Committees of the Society have been organized at Ashuganj, Chandraghona, Chittagong, Fenchuganj, Polash, Rangadia, Sylhet, JFCL, Rajshahi and Ishurdi.
13. The Society has made significant progress in respect of a study of the problems of the professional chemists. It has made several representations to the proper authorities for creation of new job opportunities for the chemists in different establishments and for safeguarding the professional interests of the working chemists.
14. The BCS opened a Welfare Fund in 1988 to offer financial help to its members in distress. From this fund, an amount of Tk. 15000/- was donated to the family of late Mr. Mustafiz Dipak, a BCS member and a Chemist of BSFIC who died on December 08, 1988. An amount of Tk. 5000/- was donated to Mr. Md. Nazrul Islam for treatment of his ailing daughter.
15. The BCS donated a sum of Tk. 25000/- to the President’s Relief Fund to help the government’s efforts for emergency relief work during the devastating floods of 1988.
16. The Society awarded the BCS Gold Medal 1988 to two distinguished personalities, Emeritus Professor Mofizuddin Ahmed of Dhaka University and Mr. A. K. M. Mosharraf Hossain former Secretary, Ministry of Industry in recognition of their outstanding contributions to chemistry, chemical industries and BCS.
17. BCS has been cooperating with the activities of other Chemical Societies in Asia-Pacific region as a member of the Federation of Asian Chemical Societies for the last 12 years.
18. It was accepted as a member with observer country status of the International Union of Pure and Applied Chemistry (IUPAC).

## **Contribution from the Bangladesh Chemical Society**

19. The Society maintains regular contacts with most of the learned and professional societies of the world to develop and foster regional and international cooperation.
20. BCS donated a sum of Tk. 21000/- to the Prime Minister's Relief Fund to help the affected people due to cyclone and tidal surge of April 1991.
21. A representation as regards the introduction of 100 marks in chemistry at the SSC level in place of 50 marks was submitted to the Chairman, National Curriculum and Text Book Board, Dhaka on 31 July, 1995 and it was implemented.
22. BCS sponsored the 29th Executive Committee meeting of the Federation of Asian Chemical Society (FACS) held on 28-29 January, 1996 in Dhaka.
23. BCS played an active role along with other societies in realizing the demands for repealing the Drug Control Act of 1982 13(1). This clause debars the chemists, biochemists, microbiologists and others from the production and quality control of pharmaceuticals.
24. BCS donated a sum of Tk.50,000/- to the Prime Minister's Relief Fund to help the affected people due to the devastating flood of 1998.

## Contribution from Prof. B. M. Abegaz, Coordinator NABSA

### NETWORK FOR ANALYTICAL AND BIOASSAY SERVICES IN AFRICA – NABSA<sup>1</sup>

The activities of the Network include the following:

- 1. Offering high field NMR (300 and 600 MHz), Mass spectral (LRMS) services.** Since January 2000 we have measured 1057 NMR and 327 mass spectra to chemists in Cameroon, Kenya, Nigeria, Senegal, Tanzania and Zimbabwe.
- 2. Hosting short-term visits.** Two to three visitors (mostly PhD students and in a few cases senior faculty members) come with samples and semi-purified extracts to do structure elucidation work in our laboratories. So far we have had visitors from universities of Yaounde, Dchang, Addis Ababa, Ife, Witswatersrand, the University of the North. These visits have resulted in a number of joint publications.
- 3. Postgraduate Symposia.** We are engaged in a unique partnership with two regional universities (Universities of the Northwest, Potchefstroom University – both in South Africa) in hosting a day-long, rotating postgraduate students symposium. This occasion allows postgraduate students from the three universities to meet for a whole day and make oral and poster presentations.
- 4. Information support.** We offer literature search services using commercial CD-ROM and the ALNAP database on African Plants in the Current Phytochemical Literature.

As can be seen from the range of activities described above, the Network is aiming at supporting the research and postgraduate efforts of individuals, research groups and institutions. Many institutions in Africa have faced difficulties to launch and sustain respectable postgraduate programs in chemistry. As a result many of the best students have left their home institutions and gone overseas. Many fail to return and this has contributed to the present situation. Postgraduate programs are important because the research activities associated with them offer opportunities and challenges to address the most pressing local national and regional problems. Many countries appear to have realized the importance of research and postgraduate education and one begins to observe signs of change. One of these signs is the acquisition of high field NMR spectrometers. Botswana has acquired two (a 600 and a 300 MHz spectrometers) Addis Ababa (a 400 MHz), Zimbabwe (400), Lesotho (400), Kenya (a 300 and two 200). Many universities are rethinking their plans and strategies and funding mechanisms. New relationships, now focusing more on sub-regional and regional co-operations are being defined. We believe that opportunities are now possible for more and effective international cooperation.

NABSA is doing a major effort – given the limited resources available to the Network. NABSA would be very willing to explore ways by which its effort to promote and further internationalize its intra-African cooperation through collaboration with institutions, chemical societies and federations.

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<sup>1</sup> NABSA is a network of laboratories offering analytical and bioassay services to African scientists. Coordinator: Professor Berhanu M. Abegaz, Department of Chemistry, University of Botswana, P.O. Box 70163, Gaborone, Botswana. Tel: (267) 355 2497, Fax: (267) 355 2836. E-mail: [Abegazb@mopipi.ub.bw](mailto:Abegazb@mopipi.ub.bw). NABSA receives regular support from IPICS (Sweden), and has in the past, received financial support from UNESCO, IOCD and USAID.

## Contribution from Prof. Belombé (Cameroon)

Dear Dr. Jost,

Given the fact that the creation of a body such as a "Chemical Society of Cameroon" is still in its prospective stage, I wish to outline to the attention of IUPAC and the developed World some of the salient aspects in Chemistry where assistance and collaboration are badly needed in this country. Cameroon has, at present, six State Universities, of which five host Chemistry Departments. Virtually all of these Departments suffer from the lack of infrastructures, basic equipment, laboratory materials and chemicals, as well as library books. Thus, practical laboratory work and research activities are in serious jeopardy.

I share the opinion that for the Chemistry of the 21st Century to contribute fully to the betterment of contemporary society, care must be taken, first of all, to make judicious use of chemical capabilities and facilities, wherever they may find themselves around the world. In Cameroon, as a matter of fact, there are a number of competent chemists (biochemists, biologists, pharmacists, etc) - including my modest person - who are actually idling around, despite the top level training they received abroad, in some of the best Universities and Schools of the world, simply because of the lack of the bare minimum needed to carry out basic chemical activities.

I wish to suggest, in the short term, that IUPAC and the Developed World revise the flexibility of their cooperation and collaborative schemes towards developing countries such as to extend their action also to competent individual chemists in those countries which do not have National Chemical Societies, it being well understood that the countries shall, in the long term, be struggling very hard to organize their own Chemical Societies, eventually with the assistance of the IUPAC and the economically strong countries.

In Cameroon, the prospect of founding the "Chemical Society of Cameroon" (CSC; Chem. Soc. Cam.) has been envisaged for some time now. Despite big hurdles that must be surmounted such as the small number of professionals, lack of logistic and financial means, we plan (a few colleagues and I) to convene a constitutive meeting in the near future in order to draft the constitution and the by-laws of the Society. In this regard, we hope that we may count on some assistance from IUPAC and/or the industrialized world.

Another aspect where assistance is highly needed relates to the problem of acquiring visas by citizens of developing countries in order to travel into industrialized world. Maybe IUPAC could find in future some ways of milder the incredible frustration we have to undergo in the process of getting a visitors visa.

Regarding the "Cooperation With Chemists In Developing Countries", I fully agree with the "Rationale" and the "Proposal" outlined by the Meeting of National Chemical Society Presidents, Berlin, Germany, 15 August 1999, and presented in this Agenda Book.

My contribution, as an individual, to maintain the chemical momentum during the past decades in my country has consisted in the following involvements:

- IUPAC-AFFILIATE PROGRAM: Coordinator for Cameroon since 1987;
- AMERICAN CHEMICAL SOCIETY: full member (1987);
- NEW YORK ACADEMY OF SCIENCES: full member (1993);
- SIGMA XI: Life Member At-Large (1991);
- CHEMICAL SOCIETY OF JAPAN: Full member (1987-1993)

Prof. Dr. Michel M. Bélombé

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# Contribution from the American Chemical Society: Notes on the meeting of Major Chemical Societies



## American Chemical Society

International Activities

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June 5, 2001

### Notes on the meeting of Major Chemical Societies November 29 – December 1, 2000

Ritz-Carlton Hotel  
Washington, DC

**Introduction.** Mr. Henry F. Whalen, Chair of the ACS Board of Directors welcomed all participants. Dr. John K Crum, ACS Executive Director, invited everyone to visit ACS Headquarters at 16<sup>th</sup> and M St. At Mr. Whalen's invitation, all participants introduced themselves.

Mr. Whalen noted that the meeting follows from one held in July, 1999 at Ascot, UK, in which representatives of the four major chemical societies, from Germany, Japan, the UK and the USA, participated. A further meeting including many of the world's chemical societies took place at the IUPAC Congress and General Assembly held in Berlin in August, 2000. The current "C-6" meeting was a continuation and expansion, bringing together the world's six best-resourced chemical societies to share information on the challenges they face, the activities they carry out and to search for additional areas of mutual collaboration. In addition to the original "C-4" countries, France and the Netherlands were included.

The two days of discussion in plenary sessions and in small groups centered around common issues involving the official statements from the Ascot meeting, the Internet, Chemical Education, Membership, relationships with IUPAC, Green Chemistry, and International standards. A summary of the discussions is presented below.

- I. **Ascot policy statements.** Most of the societies indicated they use the statements as policy guidelines. The American Chemical society has referred the Ascot and Berlin policy statements, included in the meeting agenda book, to its cognizant committees. In most cases the committees approved the statements, seen as consistent with current ACS operations and policy. The Gesellschaft Deutscher Chemiker reported that it had expanded and emphasized the statement on Code of Conduct. The Max Planck Society supports it also.
- II. **Internet Issues.** Societies reported substantial growth in use of the Internet in most aspects of their operations including member services such as meeting and membership registrations, voting in society elections, educational programs, publications and e-conferences. The following comments were made.
  - ◆ Several societies mentioned plans to use the Internet more aggressively to contact and poll individual members as well as to facilitate electronic debate. Participants noted there is great

## **Contribution from the American Chemical Society: Notes on the meeting of Major Chemical Societies**

interest in identifying who are the users, but analysis is still in a primitive stage. Internet use will become more personalized.

- ◆ RSC representatives noted that chat rooms don't necessary work well. Experience with ChemWeb indicates that many users participate only as spectators
- ◆ A KNCV representative suggested that websites should be used to publish short vignettes that would be broadcast to members according to their fields of interest.
- ◆ Internet usage is international. ACS noted that in a typical month on the ACS website 4000 sign-ons come from Japan, 2300 from Germany, 1700 from UK, 1500 from France and 780 from the Netherlands. In a given month, less than 10% of the contacts on the RSC website come from within UK
- ◆ The GDCh noted that a significant number of hits are due to search engines.
- ◆ Participants agreed that some sections of society web pages should be reserved for members only.
- ◆ An RSC participant suggested that Elsevier's ChemWeb is becoming a threat to established societies. For the first time this year ChemWeb, supported by advertising, made a profit. The number of users is growing past 180,000. ChemWeb provides some membership services to subscribers at no cost.

Those present made the following suggestions:

1. Establish a universal bank of keywords, publicized on the Web. This would help in searching articles and databases. Although the authors of papers are asked to provide keywords, these are not always the best ones.
2. The Internet could be utilized more effectively for electronic meetings. This would help young people who often don't have the funds to attend meetings in person.
3. Electronic newsletters should be established and e-mailed to members, laboratories and other institutions.
4. The Internet could be used more extensively to obtain feedback from members and customers.
5. Societies should collectively or separately establish web page(s) to publicize the benefits of chemistry to the general public. This already is done by the American Medical Association to explain the benefits of medicine.

**III. Education Issues.** Although the education systems of France, Germany, UK, Japan, Netherlands and the USA differ appreciably, participants noted that all countries are working basically toward the same goal – to provide students with a good education in chemistry, supporting the students' career goals. The following comments were made.

- 29 European countries signed the Bologna declaration of June pledging to reform the structures of their own higher education systems in such a way that overall convergence would eventually prevail.
- Ministries of Culture and Education are discussing how to reform. Education across Europe is moving slowly toward the BS/MS/Ph.D. system.
- The GDCh has published articles on the German educational system and on supply and demand of chemists.
- Special efforts are being made in Japan to help students develop creativity and independence of thought.

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- The relative number of women graduating from universities with undergraduate and graduate degrees in Chemistry is increasing in most countries, but not as fast as the number of women studying biochemistry and biology. There are comparatively few women in faculty positions in chemistry in most of the countries represented.
- Some faculties in the Netherlands are closing because of the small number of students.
- A lack of well-trained secondary school teachers is a big problem in the U.S., especially since 56% of U.S. high school students take chemistry. In the Netherlands, many secondary teachers leave teaching for other positions.
- Employment issues are intrinsically connected to educational ones. However, most U.S. students who earn degrees in chemistry do not ultimately establish careers in chemistry.
- The U.S. currently has to import many scientists, about 125,000 H-1 visas were issued in 2000. This is on the increase, even though a new law exempts university positions from the H-1 limitation. Many foreign nationals are being attracted to teach in engineering schools. China, and Korea are beginning to pull ahead scientifically since many Chinese and Korean students return home after schooling in the U.S. and elsewhere.
- Current practice in the U.S. is to emphasize and develop more options at the Masters level. B.S. chemists in the U.S. are not considered as technicians in industry, but B.A. students and graduates of 2-year colleges often are so considered.
- With the exception of biology, increasing time in science classes in the UK doesn't seem to increase the number of students interested in science. Biology students confront complex systems earlier in their academic careers and perhaps this captures their interest more effectively. A similar approach, employing actual problems as pedagogical exercises, is being tried in Holland. 70% of German biology students are women.
- Changes in chemistry curricula in the U.S. are very slow, possibly, in the view of one participant, because the textbook publishers have a stranglehold on content of textbooks.
- The greatest need at the end of the bachelors program is to broaden the scope of the individual. It would perhaps be worthwhile to develop a more job-oriented curriculum by combining chemistry with physics, biology, economics and business administration. The criteria for the Chemistry Olympics should perhaps be changed to reflect the new realities in employment of chemists.
- Education of Ph.D.'s has been perhaps the least-addressed issue. In response, ACS has created a new Office of Graduate Education.
- The GDCh is actively developing chemical education projects on the Internet. There are plans for the French Chemical Society to work with the Germans on the project. The German Chemical Producers Association is developing a similar program similar for training of apprentices.
- ACS is establishing a "virtual campus" which will use the Internet for chemical education. The Internet is being used as the appropriate technology to supplement *ChemCom* and *Chemistry in Context*.
- An NSF-funded project at UCLA will use the Internet to communicate with large classes.

**IV. Membership Issues.** Attendees received a presentation on ACS membership issues by Dr. Nancy Gray, Director of Membership. The following comments were made.



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- The European chemical societies are not trying to attract non-domestic members, but chemists are encouraged to join locally, then become part of the larger European community of chemical scientists through their local membership. Europeanization is considered a part of globalization.
- The ACS Board of Directors has adopted a policy of cooperation, not competition, with other societies.
- The Royal Society of Chemistry has broadened its membership criteria and also introduced changes in membership distinction. The society of the Netherlands has also broadened its membership criteria. RSC has created the membership C. Chem category, indicating a chartered chemist. The C. Chem might eventually become a license to practice chemistry.
- It is important to be mindful of what younger members will require of their scientific societies. Advice and assistance in career development is especially important to younger members. A key to engaging them is use of the Internet.
- Video conferencing techniques and the Internet would seem to be good ways to stage international meetings. However, several European societies noted that videoconferencing has not developed large audiences. Possibly, text-based communications would do better than video-based; chemists output in the literature is text-based.
- ACS is arranging or has produced conferences in nanochemistry, biology, proteomics and combinatorial chemistry. Some of these are envisioned for European audiences.
- Complexity of the European system of educational qualifications means that job mobility of chemical professionals across borders remains a challenge.

V. **Green chemistry.** ACS President Daryle Busch described how the Green Chemistry Institute has become part of the ACS. He noted that the GCI will work for cooperation between industry and graduate education. The international aspects of GCI will initially involve CHEMRAWN, GCI International Chapters, and a 2<sup>nd</sup> Green Chemistry conference in China. Development of international networks will be especially important. Attendees noted the following.

- Nominees are being sought for the Joe Breen Memorial Fellowship in Green chemistry.
- Green chemistry is to share. It will be the work of all societies to help inspire action by industry. A Green Chemistry conference of industrial leaders should be organized. However, environmental problems are also population problems and chemistry is often held responsible for difficulties that arise in the energy sector.
- The societies should work together to support R&D activity in Green Chemistry. They should promote information exchange and international interactions in the field.
- RSC has funded a Green Chemistry Network at the University of York to promote best practices.
- Costa Rica is developing a Curriculum for Sustainable Development.
- Government interactions are very important in this field. Britain has a Department for Environment, and Transport. Japan has an environmental agency, but not a ministry.

VI. **International Standards.** Dr. Nina McClelland presented current issues in Standards and Conformity Assessment, concentrating on metrology, standards, testing and quality. She noted that, unfortunately, U.S. industry was not greatly involved in creating the

## **Contribution from the American Chemical Society: Notes on the meeting of Major Chemical Societies**

existing international standards for chemicals. The U.S. chemical industry, she said, is underrepresented in ISO and ANSI. She added that the ACS is a member of ANSI, which is the U.S. representative to ISO. She inquired: to what extent the visiting societies are involved with issues of international standards?

- The Chemical Society of Japan representatives responded that CSJ is not directly concerned with standards, but its members are. The French Chemical Society, The Royal Society of Chemistry and the KNCV are not directly involved, but they often are asked to recommend persons to serve on national standards boards.
- Dr. tom Dieck said that although DIN, not the GDCh, handles the German equivalent of ANSI's role, the GDCh is informed of the copyrights to the German standards. He suggested that if ACS becomes involved in setting international standards, the European societies might also decide to take a more active part.
- It was noted that shared standards are crucial for widespread accreditation of educational programs.
- Dr. McClelland informed the participants that she would contact them soon regarding this issue. She intends to visit Europe during the first half of 2001 to discuss international standards.

**VII. IUPAC Interactions.** Dr. Ted Becker, IUPAC Secretary-General, spoke on the new role of IUPAC, as follows:

- IUPAC has been restructured, with a project-driven system replacing the old commission-driven one. The organization expects to be more outward-looking than in the past. IUPAC is actively soliciting ideas for useful and appropriate projects.
- IUPAC will continue to assist chemical science in developing countries. In this regard the Union is polling chemical societies worldwide to determine what assistance they currently render in the developing world.
- IUPAC can lend international credibility to cooperative projects. Also, it can help maintain communications with small societies.
- IUPAC will organize a World Chemical Leadership Meeting on July 9, 2001 in conjunction with the IUPAC Congress and General Assembly in Brisbane, Australia. The meeting will include national chemical societies, regional federations and major trade associations.
- IUPAC has a role in chemical education. The recently-published report by IUPAC's Education Strategy Development committee will be implemented by a special working party and the existing Committee on the Teaching of Chemistry.

Dr. Becker asked the participants for their ideas and suggestions regarding IUPAC's role. The following responses were brought forward.

- IUPAC should focus on projects that its funders are willing to support, and try to improve contact with the industrial sector. This might be accomplished through the International

## **Contribution from the American Chemical Society: Notes on the meeting of Major Chemical Societies**

Council of Chemistry Associations, whose Secretariat currently is at the ACC in Washington, DC. Industry in many of the constituent countries is asking why IUPAC should be supported.

- IUPAC should focus on those specific activities that only IUPAC can do well. In particular, IUPAC provides an effective forum for chemists from developing countries to meet with scientists from the developed world.
- Currently, CHEMRAWN and nomenclature are the IUPAC programs that appear to benefit the chemical enterprise most.
- IUPAC might have a role in the development of international chemical standards.
- IUPAC's divisional structure is effective.
- Reorganization was achieved through essentially a top-down approach. Not everyone active in IUPAC supports the new system or the approach. The new arrangement needs to be further sold to its natural constituency, those active in IUPAC. This can be discussed and carried forward at the Brisbane meeting.
- There will likely be overlap/competition between IUPAC and other groups on certain projects. It is important that IUPAC continue to talk with the national societies.
- The Education report could be improved if it would identify strategic issues more clearly. It should also specify procedural recommendations. One such issue is the transfer of technological expertise.
- Chemists from developing countries should be encouraged to attend the meeting in Brisbane. Perhaps UNESCO could provide some travel support
- In discussions of IUPAC, its leaders should remind the community that IUPAC exists as part of an international network, the International Council of Scientific Unions (ICSU). More discussion should be presented on the role of ICSU in promoting international cooperation in science.

**Closing recommendations for future action.** Dr. Pavlath led a discussion of future actions. He and others recommended the following:

1. A web page should be produced to educate the general public about the many benefits of chemical science.
2. Societies should develop programs for exchange of students.
3. The constituent societies should prepare to deal with the issue of certification of chemists. Legislation may force the issue in some countries.
4. Reciprocal arrangements for complimentary meeting registration should be explored.
5. The largest societies should work together to develop programs to help chemists in developing countries.
6. All should collaborate to safeguard the public image of chemistry and chemists.
7. More women and young scientists should be involved in chemistry at all levels. More than a top-down approach is needed. Societies should work together to promote international interactions among these two important constituencies.
8. Issues in science education are generally similar in various nations, but different in detail because of diversities in educational systems. Learned societies need to maintain contact, develop joint activities where possible. Special efforts should be made to support chemical education at the K-12 level.
9. Discussions of combined action on trade and chemical standards are needed.

**Contribution from the American Chemical Society:  
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10. Societies should issue a warning that the future of long-term research and development is in jeopardy. Part of the societies' role is to identify and help advance cutting-edge science and technology.
11. The sharing of information on best practices in all areas of chemistry and society operations is important. Societies must take a lead role.
12. Learned societies should work together to develop Green Chemistry programs worldwide.

**Closing.** Mr. Whalen thanked all present for their participation. The meeting adjourned at noon on Friday, December 1, 2000

*John M. Malin*  
*1/8/2001*

## Contribution from the Chemical Society of Ethiopia

I am now writing to you to briefly introduce our Society to you and to let you know our general aims and goals so that you may be able to see if there is some area in which chemical societies in developed countries and IUPAC might help us strengthen the chemical sciences in Ethiopia.

The Chemical Society of Ethiopia was established in 1983 by a few chemists. Its membership at present consists of teachers in high schools (a majority) and higher institutions of learning and chemists working in a few institutions and the limited number of industries in the country. It also has a number of institutional members from industry and governmental organizations. The Society publishes a newsletter, *Solutions*, and a refereed journal, the *Bulletin of the Chemical Society of Ethiopia*, the later since 1987. Both are published twice a year. Support for these publications has so far come from the Research and Publications Office of Addis Ababa University, the Ethiopian Science and Technology Commission and the Swedish International Development Agency.

The Society holds an annual congress every year during the first week of August. It runs a number of seminars, workshops, and other activities that it deems will be useful to its members, students or to the public at large. For instance during the past year we had workshops on "Modern and Traditional Brewing in Ethiopia" and the "Chemical Weapons Convention"; a "Chemistry Open Day" was held for high school students this past February. The Society has a number of award programs: leadership (every five years), industrial achievement (every two years), chemical education (every two years) best chemistry graduate of Addis Ababa University (every year), and female graduate of the year (every year). The Society holds a "Chemistry Open Day" for high school students in and around Addis Ababa where the Society has its offices. Students compete in "Mastermind" (answering chemistry questions), experiments, poster presentation and poetry. Small prizes are given for winners in these competitions. All these programs are run with funds raised from local sponsors. Societies in developed countries could assist in providing books and chemistry kits which will serve as prizes. In collaboration with the Ethiopian Chemical Society in North America, the Society has started a scholarship scheme for two students per year in order to attract capable students to study chemistry at Addis Ababa University. We are in the process of establishing "focal points" in different regions of the country; we hope that these will eventually grow into regional chapters of the Society.

The Society at present has its offices in the Department of Chemistry at Addis Ababa University. It has two secretaries and a part-time program officer who are on payroll. It has a president, vice president, secretary and treasurer. The executive body is the Executive Committee which consists of the above elected officers, the editor of the *Bulletin* and three other elected members. All eight members serve voluntarily and are elected every two years by the general assembly.

Some short term aims and goals:

- The strengthening of chemistry requires that the youth of the country be properly introduced to scientific thinking right from the beginning, especially in a traditional society like ours. This needs improvement in the teaching methodology at the elementary and high schools. This is one area in which the societies in developed countries could make a meaningful difference by sharing their

## Contribution from the Chemical Society of Ethiopia

experiences and providing teaching materials which have been developed in their respective countries.

- To strengthen its financial resources is a very pressing need of the Society. Dues from members form a very tiny fraction of the Society's financial requirements. Hence the need to look for other sources of funds. One way is to increase institutional membership – a drive to do this is underway. Another might be to increase subscribers to the *Bulletin* – this is being attempted. A third way might be to be able to provide training, information, consultancy, etc. for which charges could be made. For this the Society needs to build its infrastructure and have access to publications and other information. This is another area in which I believe IUPAC and the societies in developed countries can help.
- The Society needs to have its own offices. It is in the process of requesting the government for land on which it can erect a building. This is a third area in which societies and related organizations could enable the Society to stand on its own feet to be able to strengthen chemistry in the country.

I hope I have not taken up too much of your valuable time. Since I do not know how much you know about our young Society, I thought a brief introduction was necessary before I could lay out what possible areas of help we need.

## Contribution from the FECS



### Federation of European Chemical Societies

**The Federation of European Chemical Societies (FECS) is a voluntary association, promoting cooperation in Europe between non-profit-making scientific and technical chemical societies.**

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#### **Briefing for IUPAC meeting, Brisbane, July 2001**

#### **Assistance to Developing/Economically Disadvantaged Countries**

A powerful voice for chemists and chemistry, FECS involves about 50 member societies representing individual chemists in academia, industry and government. Many of these societies are smaller organisations in the countries of central and eastern Europe.

The scientific work of FECS is carried out through its Divisions (Analytical Chemistry, Food Chemistry, Chemical Education, Chemistry and the Environment, Electrochemistry and Organometallic Chemistry) and Working Parties (Computational Chemistry, Nuclear and Radiochemistry, History of Chemistry). One of the priorities of FECS is to promote European identity among chemists through mounting high level European chemical conferences. It already sponsors the conferences in the following series of events: Euroanalysis, Eurofoodchem, FECHEM conferences on Organometallic Chemistry, ECRICE (European Conference on Research in Chemical Education), Euroresidue, Eurofoodtox, Chemistry and the Environment. Members of all FECS societies participate at advantageous rates, and many opportunities are provided for young people to receive bursaries. The series of small informal EUCHEM Conferences promotes discussion in emerging areas of chemistry.

FECS therefore provides a useful opportunity for the smaller societies and their members to be involved in networking, enabling them to benefit from the advancement of the chemical sciences and the dissemination of scientific knowledge.

In response to discussions at a meeting of Presidents of FECS member societies, it proposed to mount broad-based chemistry conferences bringing together chemists from the breadth of the chemical sciences. Additionally, enhancement of FECS web-based activity (see below), compilation of information on curricula and the comparability of qualifications (see below), and promotion of AllChemE activities (see below) will provide benefits for chemists in economically disadvantaged countries.

**FECS President, Dr Reto Battaglia**

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## Contribution from the FECS

### The Public Image of Chemistry

#### Use of the Web

FECS [www.chemsoc.org/fecs](http://www.chemsoc.org/fecs) has supported the development of a number of electronic sources of information including:

- European Network for Chemistry <http://www.chemsoc.org/networks/ENC> giving information about major European chemistry societies & organisations (including FECS), initiatives & projects, industrial & research developments, forthcoming conferences & events, funding & awards, younger chemists activities throughout Europe, important publications, careers advice, access specialist networks
- A directory of European Computational Chemists is available via the FECS website on <http://newton.phy.bme.hu/chem/wpcc/chemists.html>
- A directory of Organometallic Research Centres in Europe contains details of over 2000 European organometallic chemists and is available on the internet, at <http://wwwtw.vub.ac.be/ond/aosc/eoc/default.htm>
- A directory of 100 Distinguished European Chemists from the Chemical Revolution to the 21st Century is available on <http://www.chemsoc.org/networks/ENC/fecs/100chemists.htm>

In response to the FECS Meeting of Presidents in Rimini in October 2000 it is proposed to generate and maintain a specialised electronic web-based database to include as many chemists as possible; such a database would allow chemists to be contacted according to their scientific profile and would serve as a forum for discussion on issues of importance to chemists in Europe.

Arrangements for the AllChemE (see below) workshop 'Sustainable chemistry and technology include an internet forum and it is possible that the workshop on 'Chemistry, society and the young' which will address the public appreciation of chemistry may be able to benefit from a similar internet discussion.

#### Dealing with Governments

FECS is particularly active in AllChemE, the Alliance for Chemical Sciences and Technologies in Europe, which aims to influence the future strategies of the European Commission, other European groupings and national bodies. Together with European groupings representing industry, research councils and chemical engineering, AllChemE develops common viewpoints on education and science related issues. By sharing information on good practices from a European perspective, academia and industry will more effectively and efficiently be able to meet the challenges of the 21st century.

An AllChemE position paper on *Chemistry working for Europe* is available on the web at <http://www.cefic.be/allcheme/workforeurope/index.asp>. AllChemE is currently involved in supporting the creation of the European Research Area and to this end is mounting Workshops on 'Nanotechnologies', 'Chemistry in the Life Sciences', 'Sustainable Chemistry and Technology', 'Catalysis', and 'Chemistry, Society and the Young', these areas being central fields in the next European Union Research Framework Programme. Reports of all AllChemE workshop activities are available on the web site [www.allcheme.org](http://www.allcheme.org).



## Contribution from the FECS

AllChemE activities have contributed significantly to an increased awareness of the role of chemical sciences in Europe' and FECS believes that a higher profile for chemistry would result from an increased role for AllChemE.

### Education in 'Chemistry as the Central Science'

*Chemistry and chemical engineering are central to the disciplines of science and engineering, as they underpin many areas, including the life sciences, new materials and processes, biotechnology and agriculture. Progress in health care, environmental protection and wealth creation is dependent on advances in the chemical sciences. The continued development and application of the chemical sciences is fundamental to achieving health and prosperity for the people of Europe. [Chemistry working for Europe, FECS 2000]*

The FECS Divisions play a key role in developing curricula for chemical science in higher education, for example publishing Eurocurricula on food chemistry, electrochemistry and analytical chemistry, together with a text book on analytical chemistry.

The European Communities Chemistry Council (ECCC), constituted under the auspices of FECS, comprises national societies in the European Union, both learned societies and professional associations, representing over 100,000 chemists, of whom 50% are under 35 years old. ECCC has created schedules of qualifications at three levels, including Category A <http://www.chemsoc.org/networks/enc/ecccqualifintro.htm> which provides the education basis for the professional designation 'European Chemist' <http://www.chemsoc.org/networks/ENC/ecrb.htm>. All these activities are now open to the involvement of societies in central and eastern Europe.

During a meeting of Presidents of FECS member societies, concern was expressed about the implications for the chemistry community arising from changes in industry structure. Consequently, FECS hopes to be able to undertake the following actions:

- A critical review of the quality of graduates and post-graduates, particularly in relation to the US and Japan should be produced; any specific strengths and weaknesses should be identified;
- A survey should be carried out to determine in which European countries there is a feeling that standards in school teaching for science are declining because of a shortage of chemists and physicists becoming teachers; in those countries what is being done to improve the situation?
- A review should be conducted into how national societies are changing their services and activities to provide for chemists working in multidisciplinary work, eg: nanotechnology, materials, energy, biological sciences, environmental issues
- Guidelines for ethical behaviour and practices in the chemical sciences should be adopted.

### **The Need for International Standards**

The FECS Division of Analytical Chemistry is particularly active in Quality Assurance and Accreditation, with a working group headed by Prof. Dr. Wolfhard Wegscheider, Austria and co-operates with IUPAC, ACTIVE, EURACHEM, CITAC.

## **Contribution from the French Chemical Society**

The French Chemical Society develops cooperative action with several Chemical Societies of Developing Countries in Africa. Among them the Tunisian Chemical Society and the Societe Chimique de l'Ouest africain, as is to be seen on Actualité Chimique Feb 99, p 40; Jan 99 p 30; June 00 p41. The contents of their journal are published in Actualité Chimique.

Participation in the congress of the Societe Chimique de l'Ouest africain (31 July-5 August 00) in Conakry (Guinea)

## Contribution from the Gesellschaft Deutscher Chemiker

- Provide free copies of the "European Journal of Organic Chemistry" and the "European Journal of Inorganic Chemistry" to the chemical societies of Bulgaria and Slovakia.
- A bilateral cooperation agreement exists with the Polish Chemical Society which, among other things, allows members of that society to use benefits and services at the same conditions and prices as members of the GDCh.
- A reciprocal name lecture ("Marie Sklodowska-Curie - Wilhelm Klemm - lecture) has been arranged with the Polish Chemical Society.
- A similar bilateral agreement exists with Chemical Society of Brasil (Sociedade Brasileira de Quimica).
- Provide used books, journals and equipment to countries such as Russia, the Baltic states etc., which are donated by individuals or partner organizations. In the process of building a corresponding internet based service.
- Had a first conference of young chemists from Poland, the Czech Republic and Germany this March in Regensburg, Germany. The conference brought together a number of young scientists from these countries in order to establish and/or strengthen the cooperative networks between the participants and their research groups. Travel and accommodation costs were covered by the GDCh.
- Planning to make this a regular event and to also invite younger chemists from other Central and Eastern European countries, such as Hungary, the Baltic States, Slovenia, etc.
- There are a number of foundations administered by the GDCh which have among their central aims the support of scientists from countries of Central and Eastern Europe. Applications for a corresponding scholarship of the Manecke-Foundation were recently invited.
- Implementing an internet-based platform for the donation of equipment and/or books and journals.
- Plan to support the chemical societies in eastern Europe in establishing electronic member databases in the framework of a European electronic network of chemists.

## Contribution from the Israel Chemical Society

Dear Dr Jost, Executive Director IUPAC                      July 18, 2000

As promised in my letter dated June 19, 2000 here is the data about grad students and post doc form developing countries. The information was collected from the departments of chemistry of the Israeli high education institutes (The Technion, Haifa, Bar-Ilan University, Ramat-Gan, Tel-Aviv University, Tel-Aviv, The Hebrew University, Jerusalem, Weizmann Institute of Science, Rehovot and Ben-Gurion University of the Negev, Be'er Sheva). The figures below represent the total number each year. Some of the people are, therefore, counted twice (or even three times in case of Ph.D. students). This is the reason that I do not give the sum, which might mislead. Most of post doc stay one year, but some stay for two years.

Country \ Year	1998		1999		2000	
	<u>Grad. stud</u>	<u>Post doc</u>	<u>Grad. stud</u>	<u>Post doc</u>	<u>Grad. stud</u>	<u>Post doc</u>
Bulgaria				1		
China		2				
Hungary		1				
India	1		1	30		27
Latvia				1		
Nigeria				1		1
Poland	2	4	1	1	1	
Turkey			1		1	
Former USSR		4		7		7

I hope that this information may assist you in your project.

Regards,    Arnon Shani

## Contribution from IUPAC

- Support for IUPAC sponsored conferences in NAOs that qualify as developing or economically disadvantaged countries. This support (up to USD 10 000 per conference with a maximum of USD 40 000 per biennium) provides support for internationally recognized scientists to participate as plenary or invited lecturers.
- Training program in industrial safety and environmental compliance for scientists from developing or economically disadvantaged countries. This is a joint effort of the IUPAC Committee on Chemistry and Industry, UNIDO, and UNESCO.
- Sponsored Affiliate Membership Program that provides free subscriptions to almost 400 young scientists in 28 countries.
- Hosting web sites for African Association for Pure and Applied Chemistry (AAPAC) and the Network for the Valorization of Plant Materials.
- Grants to support attendance at IUPAC Congresses by young scientists from developing and economically disadvantaged countries.
- Free subscriptions to *Pure and Applied Chemistry* for Associate National Adhering Organizations.
- Arranged and funded Joint Meeting on Chemistry in the Development of Africa Durban, Republic of South Africa 11 July 1998.
- Arranged and published report "The Status of Chemistry on the African Continent" by Dr. Chris Garbers, with financial support from UNESCO.
- Provided funding for a database of chemists in Africa compiled by the AAPAC.
- Provided funding for Joint IOCD/IUPAC Working Group Workshop on Environmental Chemistry for Regulatory Chemists and Laboratory Managers held in the Czech Republic in 1999.
- Provided funding through ICSU for Environmental Analytical Chemistry-Workshop on Problems Related to Mining in Africa held in South Africa in 2000.
- CHEMRAWN Conference on Chemistry in the service of sustainable agriculture and a healthy environment in Africa and the developing world to be held in South Africa in 2003.
- CHEMRAWN XI Latin American Symposium on Environmental Chemistry, 15-20 March 1998, Montevideo, Uruguay. IUPAC jointly funded an IOCD Environmental Analytical Chemistry for South America Workshop held in conjunction with this meeting.
- Arranged, through UNESCO, for the translation of DIDAC materials into a number of languages. DIDAC workshops have been held in 12 countries between January and August 2000, with a plan for 35 countries to receive presentations and materials by September 2001, including presentations to be made at Brisbane to cover Papua New Guinea, New Zealand, and other Southeast Asian and Pacific countries. ISESCO, an association of 42 Islamic states, will provide funds to allow presentations of DIDAC materials to be made in Islamic countries in Africa.
- IUPAC has sponsored a series of conferences on Biodiversity in Thailand, China, Brazil, and Turkey.

# Contribution from the Chemical Society of Japan

May, 2001

Proposals to the WCLM in Brisbane

The Chemical Society of Japan

The Chemical Society of Japan (CSJ) has been in collaboration with the chemical societies in Asian countries through the Federation of Asian Chemical Societies (FACS)/ the Asian Chemical Congress (ACC), etc. Financial supports to international conferences in developing and economically disadvantaged countries have also been carried out within the framework of IUPAC. CSJ is much interested in continuing such supports and in the advancement of chemistry and general sciences in Asia and wishes to propose new collaboration of the chemical societies in Asian countries by making good use of its experience.

## **1. Formation of chemical information network in Asia (expandable to other regions)**

In 1993, Science Council of Japan founded Asian Conference on Scientific Cooperation (ACSC), which has recently developed to Science Council of Asia (SCA). A representative of The Chemical Society of Japan took the initiative in this foundation. He suggested the formation of Asian Network for Publicity of Science and Technology (ANPST) as one of SCA's important activities. ANPST provides groups, educational organizations, schools, and so forth with information about science and technology, which is accumulated in ANPST in cooperation with academic societies and the industries. Within this information network, when the network on chemistry is constructed by FACS in Asia and by similar federations in any other region, we will eventually be able to establish the global chemistry network by connecting them. We should investigate a fundamental plan in WCLM.

The following pieces of information will be collected: 1) tables of contents and abstracts of journals published by the chemical societies of Asian countries, 2) the internet services about chemical education, 3) announcement of international conferences held in the Asian countries, 4) publication news, 5) patents information, and 6) directories of higher education and research opportunities, etc.

## **2. Organization of female chemists in Asia (expandable to other regions)**

Although there are a large number of women studying chemical sciences in Asia, their status appears to be less well established than their male counterparts. Female contribution is critical to the chemical education and research and its importance is expected to be greater in the 21st century (for example, the number of the senior (>50 years old) female members of CSJ is only 4% but it is 19% for the younger members in their twenties (In this sense, Japan is still a developing country in Asia). Organization of female scientists in Asia and arrangement of specific symposia on the related topics would help improve the academic and professional status of female chemists.

## **Contribution from the Chemical Society of Japan**

### **3. Organized action to recover reliance on chemistry (undertaking plans in the world)**

In developed countries, “chemical substances” are often used by media in relation to environmental pollution and hazard, and, as a result, the number of chemophobia is increasing. At 2000 Chemical Societies Meeting by six countries: U.S.A., U.K., Germany, France, The Netherlands and Japan, it was confirmed that we should collaborate in recovering reliance on chemistry. SCA held the Inauguration Conference in May this year in Bangkok, and its theme was on the sustainable development in Asia. We need to plan much more specific activities. We suggest for WCLM/IUPAC to take an initiative role, for example, in establishing “World Chemistry’s Day” and holding various meetings (lectures and experiment shows) at the same time in every country to announce how chemistry is fun and important in improving our life.

### **4. Common certification of research chemists and continuing educational opportunities**

Common certification is put into practice for engineers (APEC Engineer, ABET accreditation, Washington Accord, etc) but not for research chemists who are evaluated only by means of their presentations and publications by their peers. Without objective certification the average research chemists find it difficult to find jobs in the international market. Some “Common Standard” for the education of graduate and/or undergraduate schools seems necessary to increase the job opportunity.

Additionally, it is important for researchers and technicians in industry to keep in touch with the rapidly advancing science and technology. The necessary continuing education on the latest information is available in developed countries and in big companies. It is worthy of note for WCLM to consider developing continuing educational opportunities in developing countries.

## Contribution from the Korean Chemistry Society

Dear Dr. Jost:

The following is the summary of the activities taken or being taken by the Korean Chemistry Society on the subject of assistance and cooperation with chemists and chemical societies in developing and economically disadvantaged countries.

1. The Korean Chemical Society helps the Korean Science and Engineering Foundation to invite post-doctoral fellows from developing and economically disadvantaged countries. Foreign scientist invitation programs from developing countries, APEC countries, and ASEAN countries are in operation. Last year, through the programs about 30 chemists, chemical engineers and polymer scientists were invited to Korea from about 10 different countries such as Vietnam, Laos, Cambodia, Papua New Guinea, Indonesia, Philippine, etc.. Information on the programs is available from the Internet <http://www.kosef.re.kr>.
2. The Korean Chemical Society sends free copies of the journals published by KCS to many chemical societies in developing countries -Ukraine, South Africa, Vietnam, Uzbekistan, etc.
3. The Korean Chemical Society, with the help of KOSEF, holds a wide variety of bilateral symposiums with many foreign countries including economically disadvantaged countries.
4. The Korean Chemical Society held the IUPAC CHEMRAWN IX (Advanced Materials in Sustainable Development) in Seoul, Sept. 1-6, 1996. Many scientists were invited to participate from developing countries.
5. Efforts are being made to establish the Asia Science and Technology Center to provide a short-period, intensive trainings and educations for young scientists, engineers and governmental officers of underdeveloped and developing Asian countries.

I plan to attend the WCLM on behalf of the Korean Chemical Society.

Looking forward to seeing you soon again in Australia.

With best regards.

Sincerely,  
Jung-il Jin, Past President  
Korean Chemistry Society



## Contribution from the Mongolian Chemical Society

Country of Chingis Khan (Mongolia) is historically famous country in the World. Mongolia has more than two million population and whole territory is 15 million square kilometers. Mongolia is rich in medicinal plants, mineral resources, and organic resources, the complex using of those in practice may be immediately determine the further useful economical development in Mongolia. At present time doesn't work any industry in Mongolia on the basis of chemistry and chemical technology. Now I will give you short information about our further possibility to the development of chemistry and chemical technology in Mongolia in near future, if we could organized joint project and education in the frame of World chemistry associations, Organizations and National chemical Societies, including such international organization as ICSU, UNESCO, UNDP and USEPA.

1. We would like to ask from WCLM assemble about a possibility for organizing of International research center in Mongolia on phytochemistry and producing of new medicinal drugs from Mongolian medicinal plants, using support of International organizations, as described above. Because, in Mongolia is growing more than 750 species of medicinal plants, which are successfully used in Mongolian traditional medicine for the treatment of various of diseases, as cancer, ulcer, inflammation, diabetes, diseases with virus, fungal origin. Why this point of our contribution, is important? . Because, Mongolian ecological condition is very different in comparison with ecological regions of other Asian countries. Otherwise, chemico- technological studies on Mongolian medicinal plants not yet carried out before, as economically disadvantaged country. The biosynthesis of biological active metabolites in Mongolian medicinal plants is a specific, depending on climate zone and endemic nature. So, a many fundamental and practical results are behind us.
2. For this purpose, necessary to organize a complex laboratory in Mongolia, under supporting of Inter. science Organizations and currently to work on Inter. joint project, including scientists from collaborating countries universities and Industrial Companies from abroad. This contribution from MCS is our main request for the describing it in WCLM assemble. Please, to consider it, as well as possible.
3. Mongolia is rich in brown coal and petrol deposits. The consumption and production of active carbons is very low in developing countries like Mongolia. In recent years are started in Mongolia investigations on possibility of production of active carbons from most cheap and readily available precursors as coals, which resource is estimated 150 billion tons. This research encounter many difficulties arising from unsuitability of laboratory equipments and financial situation. Therefore, we need international cooperation and financial support for development of research on activated carbons, designed for human health and environmental protection.
4. Mongolia is rich in rare elements, as gold silver, vanadium, molybdenum, copper and rare earth elements. So, Mongolian analytical chemists would like to establish cooperation in the frame of joint research project with BacTech (Australia) Pty Ltd company on subject "The investigation of biooxidation technology of the

## **Contribution from the Mongolian Chemical Society**

refractory gold, using moderate thermophiles. Phosphorite deposits in Mongolia are also very great.

We also would like to contact with professional institutes and universities from world countries in this field of research. In conclusion I would like to point out that above describing research points (from 1 to 4) are supported and operated by our government and National Academy of Science. Our common interest for above mentioned research subjects is finding out collaborate universities and company and will describing joint research projects through immediately activity of WCLM Assemble.

### **Our proposed contribution in the field of education and other.**

We would like kindly to ask from IUPAC, ACS, UNIDO and UNESCO to organize the next or after next Asian chemical Congress/WCC 2002 or 2003 in the country of Chingis Khan (Mongolia), as one of country in Central Asia. We hope that Asian chemical Congress/WCC Assemble could do something positively for this request.

We would like to exchange scientists of above describing subjects (point from 1 to 4) between USA, France, Israel, Japan, UK and German Universities and Academic Institutes under supporting of IUPAC, UNESCO and UNIDO for a short term and long term study. This type of study and training must be bring to us a good results for our proposed projects (from 1 to 4).

We would like to find out support from IUPAC and UNESCO for the publishing of a monograph titled "A New Natural Products from Mongolian medicinal plants and Their molecular structure".

This short contribution to the agenda book of WCLM was written by Prof. O. Purev General Secretary of the Mongolian Chemical Society (MCS)

## Contribution from the Nepal Chemical Society

### Activities of Nepal Chemical Society

Professor Dr. Mangala D. Manandhar

Nepal Chemical Society was incepted in 1979. It is an association of chemists and chemistry-related personnel. It has about 1500 members, and is the third biggest Society of the country. The Society is actively involved in:

- Organising national, international and regional workshop/symposium and seminar at various level,
- Arranging talk programmes from Scientists and renowned Chemists,
- Publishing annual research journal, the Journal of Nepal Chemical Society (the paper published in the journal is abstracted in Chemical Abstract),
- Publishing quaternary bulletin imparting information on chemistry and its development,
- Providing free copy of journals and bulletins to its members,
- Decorating the students and the researchers of outstanding performance with medals and cash prizes,
- Taking active participation in the curriculum development of the Tribhuvan University,
- Taking active participation during discussion on Government policies related to chemists and chemistry related materials,
- Etc.

Nepal Chemical Society is facing multifarious problems ranging from a simple to a complex nature. The biggest problem is the financial constrain. Thus, Nepal Chemical Society is yet to establish its own Secretariat. Most office bearers are working on volunteer basis, and the Society is still in infancy stage to meet its objectives such as:

- Exchanging of scientists in the regional and the international level,
- Co-operating and co-ordinating between industries and academic institutions
- Contacting and coordinating with regional and international societies because of lack of modern communication facilities such as information technology, access to computer and its network,
- Establishing fully equipped library,
- Etc.

## Contribution from the Chemists Association of Panama

May 28, 2001

Dr. John W. Jost  
Executive Director  
IUPAC

Dear Dr. Jost:

Dr. Rafael Vasquez, President of the Chemists Association of Panama (COPAQUI), assigned me to reply your letter of April 19, regarding our contribution to the agenda for the next WCLM. Thank you for your concern about our opinion about what should be discussed in that meeting. First of all, I should tell you that I tried to fulfill this duty without the guidance of the preliminary agenda and summary of other contributions, which were not available for me. I hope my comments fix the objectives of the WCLM.

I understand from your letter that one of the objectives of the meeting is to discuss the needs of developing countries, and the way international chemists organizations can strengthen chemistry in those countries, to assist in their development. With this in mind, I should note that our organization, since its creation 25 years ago, has seen the need of a law that regulates our profession, in the same way other professions like medicine, laws, engineering, etc. are regulated. We believe that the role of chemists in the safety and development of a country is equal or even greater than other professions; however, our societies show some apathy about that. We are also convinced that the chemistry profession has not been appreciated, not because it has not earned but because historical, social, and political reasons. Our society is aware of the importance of regulating the medical activity because one mistake could kill a person; however, the same society is not aware that the mistake of one chemist could kill hundreds of people before the reasons were detected, probably because this does not happen often.

I should also mention that one of the reasons this process has been hard for us is because not many countries have laws like that. People who appose that initiative have told us that the law is not necessary because not many countries, particularly developed countries, have it. We are aware that developed countries might not need it because every industry and laboratory has highly educated chemists. This is not the case of developing countries, where companies are willing to hire high school students to "play the chemist". It is not difficult to understand why this is common in those countries. It is also not difficult to figure out the positive impact in the development of a country if this practice is banned. For this reason, in name of COPAQUI, I propose that the next WCLM approve a resolution indicating the need of bills to regulate our profession in developing countries. This will strengthen initiatives like that made for us.

Sincerely yours

Dr. Sebastian Vasquez  
COPAQUI

p.s. There is a strong possibility that our bill is approved by our congress this week.

## Contribution from the Colegio de Químicos de Puerto Rico

Dr. Jost:

Here is the contribution of our Association, Colegio de Químicos de Puerto Rico, to be included in the agenda book of the WCLM.

1. Sponsored a lunch for the Pan American Conference of the Education and International Division of the American Chemical Society held in San Juan PR, on July 2000.
2. As organizer of the XXIII Latin American Conference of Chemical Association(FLAQ) we host the participation of a Cuban scientist as delegate.
3. Sponsored the meeting of the Executive Committee of AIDIS, Interamerican Association of Sanitary Engineering(AIDIS) held in Puerto Rico. At the meeting made a request to host the Interamerican Congress of 2004.
4. Co-sponsored of a workshop for chemists of Uruguay, Dominican republic, Venezuela and other subdevelop countries of "Construction of low cost equipment for Chemistry Education".
5. Participation in the Congress of FLAQ in Peru in October 2000 and The Natural Products Congress in Cuba in April 2001.

Adnalia Flores  
President

## Contribution from Romania

### NEEDS OF CHEMISTS (MAINLY THE YOUNG ONES) IN ROMANIA - AN ECONOMICALLY DISADVANTAGED COUNTRY

The economy in Romania is faced now with a very difficult period. In the last time is a slight tendency to redress it. Chemical industry has many problems with the lack of raw materials when the contracts of production exist, lack of contracts for some products. It faces also with a hard concurrency and, many pollution problems determined closing of several chemical units. If until 1990, a big part of funds for research came from industry, presently such kinds of funds are almost negligible due to the closing of many chemical industry units.

In these conditions, the research is disfavored and survives mainly based on budget sources, which are, at their turn, very small. The financial resources have been progressively reduced. If in 1994 – 1995, 0.68 % of internal global product was allocated for research, it was of only 0.2 % in 1999. The expenses with research on capita in Romania are 6 times less than in Greece and 35 times less than in Finland and other countries. This situation affects all employees involved in research and mainly the young researchers. The very small funds allocated for research are leading to the very disastrous effects such as: immigration of the youth and of reputed scientists, who feel losers in their own country and unsatisfied with results in their profession because of very old equipment used, lack of documentation and lack of interest of society in research activity.

It is a negative perception of all kinds of research in society and even by politicians, it is still regarded as an unproductive field, so it is a lack of interest for this activity. The young graduates are not attracted by research activity because of modest working conditions and unsatisfactory salaries. The “brain drain” phenomenon by immigration or by changing working place with the better ones is very accentuated. The facilities of documentation are unsatisfactory and there is not up-to-dated information since many years.

The creative forces are dispersed; many interested projects are abandoned. So, the research body becomes older and scientific potential is continuously reduced. Because of this situation, the involvement of specialists in European projects and other projects with substantial funds is very poor and even Romanian allocated funds are lost.

There are mainly two organisms, which make efforts to organize the scientific life in Romania, to direct the research to the needs of economy, and mainly to keep the scientific potential at a worldwide level; these are National Agency of Research Development and Innovation (ANSTI) presently, the Ministry of Education and Research (MEC) and Romanian Academy.

ANSTI (MEC) coordinated the research and development activity of National Institutes specialized in various problems the main ones for chemistry are: National Chemistry Institute (ICECHIM) and National Institute for Industrial Ecology (ECOIND). Since 1996, MEC in funding research grants for national institutes, universities, commercial societies of research and development, etc. Competitions are annually organized for obtaining funds for research in various fields and projects in the framework of two national programs: Orizont and PNCDI (National Plan of Research, Development and

## Contribution from Romania

Innovation) and also to obtain four types of grants as C-type (major research programs and projects), L-type (grants for young researchers to support their mobility abroad and collaboration between institutes and universities, networking in interrelated fields), T-grant (grants for young researchers to stimulate their creativity, formation of interdisciplinary groups) and S (grants for research performed by students). The last three types of grants are introduced to limit the phenomenon of "brain-drain". Unfortunately, their success is very limited due to the very small funds available.

18 commissions are working for Orizont program, the commission for chemistry (Technologies, Materials and Chemical Products) has five objectives namely: Organic and Inorganic Products by Fine Synthesis (41 themes), System for Control of Technologies and Chemical Products to increase their efficiency and improvement of the technology (28 themes), Prevention and Control of Pollution Generated by Chemical Industry Activity (63 themes), Polymers and Polymer Composites with Controlled Structure, Technologies and Characterization (57 themes) and Valorization of Natural Resources (24 themes).

PNCDI is organized, mainly for advanced research in the field of biotechnology, micro- and nano-technologies, etc. as fields of major interest.

Chemistry Section of the Romanian Academy coordinates activity of five institutes: "Ilie Murgulescu" Physical Chemistry Institute (Bucharest), "C.D. Nenitescu" Organic Chemistry Institute (Bucharest), "Petru Poni" Institute of Macromolecular Chemistry (Iasi), Institute of Chemistry and Inorganic Laboratory (Timisoara) working by 8 specialized commissions in the following fields: thermal analysis and calorimetry, coordination chemistry, quantum chemistry, chemistry and technology of water, topological and computational chemistry, corrosion, chemical engineering and spectroscopy.

Romanian Academy introduced in 1995 competition for research grants, to stimulate mainly the basic research and to select the most valuable projects, ten percents of funds being reserved for young researchers. Several institutes of the Romanian Academy introduced for 3 years, the evaluation and selection of researchers on very severe criteria (according to European and international ones), which assure a high level of their scientific life.

Romanian research unities started to apply for programs and projects supported by European Community (PC 5, EUREKA, NATO, COST, and EURATOM), CNSIS and Worldwide Bank, but success is not as it expected because mainly of difficulties met with Romanian banks. Very few research programs funded by EC are coordinated by Romanian scientists (as from other Eastern Countries), so a better understanding of situation in disadvantaged countries and some advantages in evaluations of projects should necessary to be created. The presence of scientists in Romanian society and international life is very modest.

All mentioned indicate a high scientific human potential in Romania. Analyzing the scientific potential in Romania by disciplines, the chemistry ranks the first with ~ 53 %, followed by physics with ~ 27 %.

## Contribution from Romania

The reputed scientists are frequently asked about PhD or post-doctoral fellowships, by Romanian and from abroad young graduates. No positive answers can be given because there are no funds destined for this with a few exceptions for persons coming from Moldavia Republic. The lack of high performance instrumentation in all Romanian institutes and mainly in academic ones makes this activity almost impossible. Several grants for visiting professors and individual research collaboration between universities are seldom obtained and these are employed both to create contacts and also with sustained efforts of the dedicated researchers, affording to understanding of the colleagues from developed countries, in the framework of a bilateral collaborations, they have some possibilities to complete their research by experiments with high performance equipments available in visited institutes.

Young very talented graduates are forced to find fellowships or jobs abroad because they are either jobless or salaries are not enough to construct their future.

The needs of chemists in Romania are stringent in all aspects stipulated in IUPAC Meeting Agenda.

Help for the safe and sustainable development of chemical industry is necessary both for economical progress and especially to avoid the ecological disasters, which are unfortunately much frequently in the last time due to the old industrial equipment and lack of education in environmental protection.

Romanian Academy Publishing House and other publishing houses publish books and journals in chemistry field as: Revue Roumaine de Chimie, Revue Roumaine de Biochemistry, Cellulose Chemistry and Technology, Romanian Chemical Quarterly Reviews, etc. some of them being internationally recognized. Unfortunately because the lack of funds, the apparition of numbers is delayed so, scientific impact of published results is very low, help to pass over this situation should be necessary

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# CONTRIBUTION FROM THE CHEMICAL SOCIETY OF THE SOUTH PACIFIC

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## WORLD CHEMISTRY LEADERSHIP MEETING, 9 JULY 2001, BRISBANE, AUSTRALIA

### Introduction to the Society

The Chemical Society of the South Pacific was formed in 1985 and it has come a long way since its inauguration. Its Secretariat is located in the Chemistry Department of the University of the South Pacific and has currently about 100 members. It has active participation from the University academics, industrial chemists, and schoolteachers. One of the main aims of the Society is to foster chemical education in the South Pacific and serves the needs of professional chemists in the South Pacific region.

The Society has various activities in the countries of the South Pacific such as Fiji, Tonga, Samoa, Vanuatu, Kiribati, the Solomon Islands and the Cook Islands. This Report discusses how the Society is helping the needs of chemists in the South Pacific.

### Major activities of the Society

The activities are centered on promoting chemical education in the secondary schools in the South Pacific. Chemistry competitions such as chemistry titration competition, and chemistry quiz competition have been organised at different levels and this has created an increased awareness of the importance of chemistry in every day life in the South Pacific.

Seminars, workshops, symposia and demonstrations including chemistry magic shows, are frequently organised for senior secondary school students.

The Society also has published books in chemistry and biology mainly for the benefit of secondary school children at the higher levels. Qualified scientists who are members of the Society write these books.

The Society also offers gold medals to the students who get the best grades in chemistry in the two main Form 6 public examinations each year.

The Society also helps secondary school teachers with their chemical problems such as disposing of chemicals in their laboratories. In this context the Society organised a workshop recently on the management of hazardous and waste chemicals in which several secondary school teachers took part.

The Society, with assistance from RACI, held a conference in 1988 on assessment methods in chemistry. It aims to plan more chemistry conferences in the future.

### Future directions

- The Society has plans to institute a scholarship for graduate studies in chemistry when its savings reach a healthy level.
- Has offered to host a future Asian Chemical Congress (2003 or 2005).

## Contribution from Tanzania Chemical Society

### NEEDS OF CHEMISTRY IN DEVELOPING AND ECONOMICALLY DISADVANTAGED COUNTRIES

**NAME OF CHEMICAL SOCIETY: TANZANIA CHEMICAL SOCIETY (TCS)**

**IUPAC MEMBERSHIP STATUS: ASSOCIATE NATIONAL ADHERING ORGANISATION**

#### **TANZANIA**

##### ***Country brief***

The United Republic of Tanzania comprises of the mainland formerly Tanganyika, (independence - 1961) and the off-shore Indian Ocean Islands of Zanzibar (independence - 1963) which merged into a union in 1964 and have thrived thus since.

*Boundaries* (clockwise): Indian Ocean, (east), Mozambique, Malawi, Zambia, Democratic Republic of Congo, Burundi, Rwanda, Uganda, Kenya.

*Area*: 945,000 square kilometres

*Population*: about 35 million

*Population growth rate*: about 3 percent per year

*Economic indicators*: The country is listed among the world's poorest economies. at a per capita income of about \$250 per year The major economic base is agriculture (50 per cent of GDP) followed by industry (15 per cent), mining, tourism, the service and informal sectors in that order. The mining sector currently registers unprecedented growth while tourism holds excellent promise in terms of world class destinations such as the highest point on the continent or world's tallest free-standing mountain (Kilimanjaro), the largest wild life concentration . on earth, exotic tropical Indian Ocean beaches and the paradise islands of Zanzibar.

Tanzania embraces the global free market economy.

*Socio-political context*: Tanzania's political stability has remained a treasured hallmark on the continent. Tanzania is signatory to key treaties, protocols and conventions, regional and international central to global partnerships. Tanzania affirms and subscribes to all socio-political ideals enshrined in the UN charter.

#### **THE TANZANIA CHEMICAL SOCIETY (TCS)**

Africa's chemistry can no longer afford passive indifference to the global chemical enterprise. TCS's inception in 1999 marked one giant leap in the right direction for Tanzania; the culmination of a dream that may have loomed as tall as the Kilimanjaro itself. We can thus

## Contribution from Tanzania Chemical Society

forge forward in the global chemical togetherness that has become central to the science. A special catalysing role by the American Chemical Society deserves due acknowledgement:

- i) ACS initiatives to promote bilateral linkages with African national chemical societies saw John Malin and Paul Walter articulating and fine - tuning the promise in global chemistry with the infant TCS, an instant enthusiast (Pretoria - 1999).
- ii) ACS, with unprecedented swiftness, sent Paul Walter the ACS Immediate Past President to the TCS Inaugural Conference where he delivered a keynote address (Dar es Salaam - 1999)
- iii) Senior TCS officers two) were hosted by ACS at the 120th ACS National Meeting in Washington soon afterwards (2000) for familiarisation with how things are 'made to happen' at the world's largest chemical society.

The above has accorded a firm head start for TCS, the youngest in the global fold (which also flags off the new millennium), a privileged glimpse of rare value in terms of the society's prospects and future road map.

### **THE TANZANIA CHEMICAL SOCIETY - ACTIVITIES**

#### ***Within Tanzania***

Nationally, TCS caters for university academics, practitioners in research institutes, pre-university chemistry trainers, industry and government functionaries under the TCS agenda as spelt out in the TCS instruments.

Activities include annual general meetings, the *TCS newsletter*, short workshops, the TCS Conference (tri-annually), the TCS official mouthpiece (*Journal of the Tanzania Chemical Society*)

The TCS web site address is:

[http://www.chem,udsm.ac.tz/Index/chemistry/TCS](http://www.chem.udsm.ac.tz/Index/chemistry/TCS)

#### ***TCS in the Africa Region***

Reciprocity in attending each other's national chemical society's conference events is the norm. Affiliation to AAPAC, NAPRECA and other key regional chemical groupings forms official TCS policy.

#### ***TCS at IUPAC***

Conscious and anxious to .to navigate in unison with the global chemical enterprise, TCS deemed it judicial to register with IUPAC initially as an Associate National Adhering Organisation (ANAO). IUPAC has reciprocated. Immediate spin-offs for young TCS: Receival of *Chemistry International* issues, *gratis* subscription to *Pure and Applied Chemistry*, access to a menu of IUPAC privileges accorded to this membership category

## Contribution from Tanzania Chemical Society

inclusive of a slot in the IUPAC mailing list, notifications, conferencing support and other assortment.

### *The TCS experience with the American Chemical Society*

The experience has, due to the aforementioned, registered a telling impact for young TCS in setting out into global chemistry 'with the right foot forward'. The mood is upbeat, drawing courage from the ACS own arduous trek into eminence.

An on-going summer research programme for USA university research students mounted annually at one Tanzanian University (Dar es Salaam) is another TCS success story with ACS affiliates.

### **NEEDS OF CHEMISTS IN DEVELOPING AND ECONOMICALLY DISADVANTAGED COUNTRIES -A TCS VERSION**

An assortment of avenues is tabled as potential candidates for initial scrutiny for possible try-outs. The feed-back should prove invaluable in building on and mapping out the future of such initiatives.

### **Pre-university chemistry training; a vital base for sustenance of the future of the chemical enterprise in developing countries.**

The current pre-university chemistry training quality is undoubtedly on the decline, threatening the very fabric of the entire enterprise through feed-backs. Human, physical and material resource constraints have been among those singled out as causatives. Suggested interventional chip-ins may include the ACS - style *bookshare* (augmented by possibly an '*equip-share* ') A national chemical society is an important professional motivation for this cadre if adequately empowered to execute its programmes. Conferencing support, if available, complements and promotes healthy /functional chemical societies.

### **Professional chemistry related movements and exchanges**

For a healthy professional environment, the chemist in a developing country, or any chemist, has no choice but to ventilate and keep abreast in the face of the rapidly advancing technologies, methods and themes of the trade. The need is more acutely felt in developing countries given the multiplicity of limitations and priorities. These aspirations can be catered for by various strategies, post doctorals, exchange visits, research collaboration, professional training and specified reciprocal assignments.

## **Contribution from Tanzania Chemical Society**

Identification of joint collaboration areas between sister institutions has proven mutual benefits for parties. The untouched resources and the superior capacity/infrastructure of the developing and developed respectively combine into an excellent harnessing partnership.

### **The environmental agenda; a global urgency**

In the wake of accelerated economic / industrial growth aspirations in developing countries (say in Africa) the legacy of environmental sustainability and responsibility is inescapable. The global chemical partnership can intervene on behalf of this shared and threatened heritage through programmes such as 'safe and sustainable industrial development' initiatives.

### **Training**

Despite an unprecedented training drive, qualified chemists and chemical technologists are still in short supply in developing countries. Most cadres are trained in-house, but for the bulk of the top echelons (doctorate and post doctorate levels) training continues to be sourced from developed countries. Resources are scarce. This is a key area that can benefit from the dialogue. Some options such as *sandwich* programmes have left a telling mark in terms of productive long range collaboration for the participating institutions, an area that can be harnessed in furtherance of global chemistry ideals.

## Contribution from the Royal Society of Chemistry

### Assistance to Developing/Economically Disadvantaged Countries

- 1) Many individual members of RSC benefit from the Society's Research Fund that helps those working in less well-endowed institutions anywhere in the world. For 2001, the fund has allocated **£10000/\$15000** to researchers in developing countries.
- 2) The RSC has 14 International Sections, of which twelve are in the Third World. All are supported financially. In addition, there are over 30 International Representatives covering 26 countries – 15 of these are in developing countries but receive no financial support. This activity is under review at present.
- 3) The RSC currently supports four people each year on Voluntary Service Overseas (VSO) (**£5000/\$7500**). As part of this support, they are provided with a great deal of Society and chemistry-related materials (posters, booklets, etc). At present, volunteers are in Rwanda, Tanzania and Kenya (2). It is entirely coincidental that all are in Africa at the present time. Our support is hugely beneficial to the recipients and much welcomed by the VSO in London and its Field Offices.
- 4) RSC is now the UK National Adhering Organisation to IUPAC. There is likely to be an increasing involvement by the Society in IUPAC matters, particularly those relating to Third World issues. At present, we are much involved (financially and otherwise) in CHEMRAWN XIV on 'Towards Environmentally Benign Processes and Products' (**£10000/\$15000**). Much of this funding has helped to facilitate participation by individuals from developing countries. This conference was held in June 2001 with a continuing commitment by RSC through membership of the Future Actions Committee.
- 5) Grants and other support to major conferences in the developing world, some connected to International Section events, some not. For example, we have supported the triennial International Conferences on Chemistry in Africa (organised by the African Association for Pure and Applied Chemistry) for the last four meetings. This support extends to practical help and advice, as well as financial assistance. In recent years, we have supported several symposia in association with our own International Sections and National Chemical Societies in Africa and Asia.
- 6) We are a provider of back issues of journal runs, often in collaboration with other agencies or helpers (eg Book Aid International, British Council, certain airlines). In 2000, donations were made to Sierra Leone, Somalia and Sri Lanka. Occasionally, current journals are donated to libraries in war-torn countries or after major catastrophies, eg Bosnia, Ethiopia, Orissa and Gujarat (India).

## Contribution from the Royal Society of Chemistry

- 7) Stop-over funding for visits to developing countries to enable contacts to be made or to explore future collaborative possibilities. The JWT Jones Travelling Fellowships are sometimes awarded to individual scientists in developing countries to enable them to carry out short-term studies in well-established scientific centres abroad (**£14000/\$21000**). Likewise, the Journals Grants for International Authors frequently get awarded to those in the developing world (**£20000/\$30000+**).
- 8) We will shortly be establishing two schemes to help individuals from, *inter alia*, developing and economically disadvantaged countries to attend scientific symposia. These scheme will relate to those wishing to attend IUPAC conferences and to RSC conferences (**£25000/\$37500**).
- 9) Small grants on a one-off basis. Recently to support a Science Week in Tigray, Ethiopia and a public discussion meeting in Kingston, Jamaica. For Orissa, **£5000/\$7500** to help rebuild the chemistry department in the University of Bhubaneswar following the cyclone. Also, a waiver of fees for the year for RSC members in Orissa. Similarly, assistance is currently being offered to members in Gujarat following the earthquake.
- 10) We continue to offer to host other Chemical Societies' home web pages on our [www.chemsoc.org](http://www.chemsoc.org) web site.
- 11) Occasional bilateral agreements with other Chemical Societies over publications, copying rights (especially for educational purposes), etc. Currently, such an agreement exists with the Brazilian Chemical Society.
- 12) Last year, the RSC hosted a delegation from the Chemical Society of Thailand. The development of academic and industrial chemistry in Thailand featured prominently in discussion and we are currently assessing how best to help the Thai PhD programme in chemistry, possibly in collaboration with the British Council, DFID and FCO.

**Stanley S Langer**  
**May 2001**

k\Overseas for Brisbane

**Contribution from Prof. Patrick Moyna (Uruguay)**

Caxias, May 10, 2001

Dr. John Jost  
Secretariat  
IUPAC

Dear John:

With reference to the Presidents Meeting in Brisbane, I am quite tied up with dates, so it will be near impossible for me to stay till the 9<sup>th</sup>. But I am extremely interested in the topics to be discussed, as many were brought up by John Malin at a CHEMRAWN committee Meeting, I believe at Philadelphia. At the time I wrote to John about that, trying to broaden his proposals to include a “southern half” to them. I have left those bits in italics.

First of all, I still think it is a shame that not-so- much LCD countries such as Uruguay, Peru, Mexico, etc., are not part of IUPAC. Probably we in IUPAC have been so involved in other activities that we never had the possibility of finding a way of making IUPAC “global” when everything else was going global. But I must admit it is a greater shame for us chemists in the South to be unable to come up with a way of paying our minor dues at a time when we are able to buy books from Amazon.com without any hassle. It does not speak too well about our “professionalism”! I think one of the points for having a truly global membership will have to go through a system of “forced-fed integration”, maybe organizing Regional Societies of smaller countries and giving the lot of them a membership, or some kind of adequate system, that does not bust IUPACs organization, strain its Charter, nor its budget, etc.. But we are missing the input of a large number of very bright guys, that not only will complete the picture of chemistry worldwide, but will also contribute to IUPACs traditional activities.

Time has passed, and now I also have more to the point ideas, thinking of how to develop chemical activities in a small country such as Uruguay

I will try to bring back John’s four points and what I wrote at the time, and then bring forward some of the new proposals we have.

*Intellectual property rights - I would like to include bio-diversity rights, as there should be some future retribution to what is collected in our countries. The costs implied are microscopic when compared to the depth of ill will resulting from the cavalier way in which the darker side feels treated.* On the other hand, it would be good to think about ways in which global groups can search for, promote and even fund colleagues in the South that have good chemical ideas, but wish to stay in their old places. Having big enterprises busting each others projects is part of the game, usually their chemistry recovers OK. Usually big global players go under because of mistakes in their commercial side. But when a big (or small) northern group busts the ideas of a small team in the south the results are much worse. What is lost can represent 30 or 50% of ALL the good chemistry being developed there. What disappears is the one team and all its descendants, forever.

*Non tariff trade barriers - we are in complete accordance with John in controlling these, on agricultural products in particular. The number of times our products have been stopped, banned, cuotaed, burnt, are grotesque. The "out of the cuff" Aces that controlling agencies have come up with would bankrupt Las Vegas. The Mad Cow Disease has done*



## Contribution from Prof. Patrick Moyna (Uruguay)

more to straighten this than any number of world meetings. For what has never been accepted before is that subsidies are bad even for the subsidizers. If you subsidize beef production, someone will come up with some outrageous way of producing more beef. If you keep going loss making enterprises, you wind up by being pushed out of world competition. If you subsidize electricity you come up with blackouts be it in California or now Brazil. Why improve if you get paid anyway?

International standards in education - I think these are more in place than any of John's other points. We ALL use the same books, read Education in Chemistry for new ideas, what experimental work we could not carry out in the South because of costs, now are forbidden in the North because of dangers and personal damage insurance. IUPAC could play a role in distributing good scientific ideas for chemistry teachers and students, the general public and decision makers worldwide just by having the material translated adequately to the 5 main languages.

*But I think there should be some "intellectual training property rights" in place. The brain drain is not per se bad, as the guy that leaves usually would not find the same possibilities of expression for his abilities in his home country (or at least that is his perception). But when going abroad he takes at least 12 years of training with him, sometimes up to 18 including his tertiary level years, which were all loss for his home country. He has not produced one iota of results and he gets to the North and starts making contributions immediately. In many cases we even pay for their training as PhDs to have them stay in the North !*

Why not reimburse the home country so they can train more people? If in the South we paid for those returning with PhDs we would turn in a nice profit that would help upkeep the general local education!

Encouragement of research capabilities in LDC – A very interesting effort has been done in this line. Many international organizations have helped, from the World Bank to IFS. Costs of communications and travel have fallen dramatically. In 1965 I traveled to London by boat for U\$ 400 one way, and in 2001 I can take a return air ticket to London for U\$ 900 ! And I am writing to you by email and I had to write to my parents by airmail (3 weeks Birmingham-Montevideo and back!). Our problems still are the lack funds for the day to day costs of research (solvents, reagents, glassware) and a solid system of financing the salaries of our researchers. Why donate a second hand or first rate NMR to a guy that cannot pay for the liquid He, his research student, and probably his 10 mL of deuterated chloroform and maybe his daughter's new shoes? That is outside the scope of any IUPAC programme, but unfortunately real. Your government devaluates the peso, guarani, dracma or whathaveyou, and there goes your library, reagents, and probably your own job.

*I am more worried for encouragement of production capabilities in LDC. What we need is chemical employment possibilities in our countries. Local industries would in turn generate funds for our research and employ our now brain-drainers and improve our national infrastructure. Much chemistry is transnational. Why not do the production and its day to day support also with a world-wide outlook?*

*Mind you, it would also help with shared contamination and environmental problems, for we would produce part of the contamination ourselves, and be involved in the sorting out of those problems. Many of the present day "ideas" of how to run the environment in LDCs*

## Contribution from Prof. Patrick Moyna (Uruguay)

*come from countries that have run rough-shod over their own natural habitats. Let us share problems and responsibilities ! Having employment would sort out the worst kind of contamination which is undernourished children.*

In Uruguay we have started a programme linking the Government, the Facultad de Química and the Chemical Industry Association to work together building a center for industrial promotion. I will go to work on that next May (2002), when I complete my contract here in Brazil. The idea is to try to establish a center where the Facultad's staff can work, which can give technical support to local (regional?) industries, try to scale up projects, and end by generating small, fine-chemicals related industries that become independent companies. Buildings, basic facilities, analytical support, batch reactors, etc., we already have. Clients and commercial know-how we need. Something partly technological park, part incubator, part think-tank (size: small). We hope to have IOCDs input into this, and maybe try to find some help in uruguayan expatriates that are linked to the chemical/pharmaceutical industries. If this sort of ideas don't work, all the other efforts in backing science in LDCs are doomed.

I hope this crude plan helps you in Brisbane.

All the best,

Patrick

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