



American Chemical Society

International Activities

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Notes on the meeting of Major Chemical Societies

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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 16th 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

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.

- 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.

- 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. The GDCh indicated interest in producing a conference in the U.S., in Colorado.
- 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 2nd 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 existing international standards for chemicals. The 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 receives 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 be 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 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.
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.

Future Meeting. The German Chemical Society kindly offered to host the next meeting of the group. A date late in 2001 was advanced, but it was eventually proposed to hold a meeting in Germany in April or May, 2002.

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