



European Association for Chemical and Molecular Sciences

DIVISION OF CHEMICAL EDUCATION

Minutes of the meeting held in Krakow, Poland on 3rd July 2005

1. Present:

Liberato Cardellini (Società Chimica Italiana)
Peter Childs (Institute of Chemistry of Ireland, Chair)
Hana Ctrnáctová (Czech Chemical Society)
Marek Frankowicz (Polish Chemical Society)
Martin Goedhart (Netherlands)
Mariann Holmberg (Association of Finnish Chemical Societies)
Ryszard Janiuk (Polish Chemical Society)
Jens Josephsen (Danish Chemical Society)
Vojin Krsmanović (Serbian Chemical Society)
Iwona Maciejowska
Ilka Parchmann (Gessellschaft Deutscher Chemiker)
Jean-Loius Rivail (Société Française de Chimie)
Reiner Salzer (Observer from EuCheMS Division of Analytical Chemistry)
Zoltan Toth (Hungarian Chemical Society)
Paul Yates (Royal Society of Chemistry, Secretary)

Apologies were received from:

Ludo Brandt (Royal Flemish Chemical Society)
Maria Elisa (Portugese Chemical Society)
Berit Fjærtøft (Norwegian Chemical Society)
Erik Onkelinx (Royal Flemish Chemical Society)
Georgios Tsaparlis (Greek Chemists Association)
Uri Zoller (The Israel Chemical Society)

2. It was agreed to add the item "Any other business" to the agenda.

3. Peter Childs welcomed Zoltan Toth to the council, as the delegate from the Hungarian Chemical Society.

4.a. Martin Goedhart queried item 12 which referred to a special edition of Chemical Education Research and Practice. Peter Childs agreed to ask Georgios Tsaparlis for information on the policy of the new journal.

Action: Peter Childs

b. Item 3. Paul Yates noted that follow up of apparently inactive members was a continuous activity. Peter Childs suggested that societies be invited to replace their delegate after two years of inactivity. Council agreed to this, and to the suggestion that societies be contacted if there is no response in a particular year.

Action: Paul Yates

c. Item 4f. Peter Childs reported that details of forthcoming conferences had been circulated via the secretary throughout the year. Paul Yates reminded delegates that he maintained an up to date e-mail list which could be used for disseminating information generally.

Action: all delegates

d. Item 5. Peter Childs agreed to circulate the DivCEd annual reports for 2003 and 2004.

Action: Peter Childs

e. Item 9a. No further details of teaching materials following the C6 meeting were available. Martin Goedhart agreed to ascertain the current status of this project.

Action: Martin Goedhart

f. Item 9b. No report had been received on the International Council for Science meeting.

g. Item 9c. Paul Yates agreed to locate the proceedings of the International Conference on Chemical Education and provide a link to them on the website.

Action: Paul Yates

h. Item 9e. The proceedings of the IOSTE meeting in Lublin had not been provided.

i. Item 9f. Delegates were invited to e-mail Ilka Parchmann if they wished to obtain the hard copy proceedings of the Dortmund Symposium. The next meeting will be held in 2006.

Action: Ilka Parchmann

j. Item 10. Paul Yates reported that he had spoken to Peter Atkins regarding increased interaction with the IUPAC Committee of Chemical Education. The minutes of the meeting would be sent to him. Peter Childs reminded delegates that he was a member of this committee and will be attending their meeting in Beijing in August.

Action: Paul Yates

k. Item 12. Peter Childs agreed to ask Georgios Tsaparlis to produce a paper outlining the remit of Chemical Education Research and Practice now that it has combined with University Chemistry Education.

Action: Peter Childs

l. Item 13. It was noted that the proceedings of the previous ECRICE had recently been distributed on CD. Paul Yates agreed to ask Dusan Krnel whether these could be made available online and to include an appropriate link on the website.

Action: Paul Yates

m. Item 18. Paul Yates noted that the attempt to obtain further national reports last year had proved fruitless. It was agreed that both the summary and delegate CV should be restricted to 200 words each. It was also agreed that if a delegate did not submit a report for two years running their membership of Council would lapse. Peter Childs suggested that each delegate provide a photograph in digital form for inclusion on the website.

Action: all delegates

n. Paul Yates noted written comments submitted by Uri Zoller concerning lack of action by Council. It was suggested that producing minutes earlier, and producing a summary sheet of actions might help.

5. Peter Childs gave a verbal report on the activities of the Division in 2004. This highlighted the links being developed with the American Chemical Society and IUPAC as well as covering many of the other items on the agenda for the meeting.

6. This was covered under item 5.

7. Paul Yates reported that the arrangements for updating the web site were to change, so that the secretary would have more control. He agreed to ask the Royal Society of Chemistry for information on the number of page hits. The idea of incorporating a calendar of events was discussed, and Marek Francowicz suggested that colour coding could be incorporated. It was agreed that a subcommittee consisting of Marek Frankowicz, Martin Goedart and Paul Yates be set up to produce a report on the website and to activate the ideas developed. Jean-Louis Rivail suggested that individuals could be given access to specific web pages with responsibility for updating.

Action: Marek Francowicz, Martin Goedhart, Paul Yates

8. Peter Childs presented a paper outlining a proposed procedure for the election of delegates. Reiner Salzer expressed concern about restricting delegates to two terms, as this could have the effect of replacing active delegates by those who were less active. Jean-Louis Rivail suggested that a CV of proposed delegates should be submitted at the time of appointment. Peter Childs agreed to include information on the role of Council members; this included attending the annual meeting, producing the national report, disseminating information in both directions, and acting on decisions made by Council. He agreed to revise the paper and to include the guidelines on the national report. There was further discussion on point 6, and it was agreed that if there was a single candidate for Chair objections would be allowed within a two week period. Otherwise the Chair could be elected with a 51% majority.

Action: Peter Childs

9. Peter Childs left the meeting while Paul Yates took over the Chair to report that there had been unanimous support for the Chair to continue for a further term. Peter Childs rejoined the meeting to be informed that he had been elected for a further term until 2008. On behalf of Council, Paul Yates thanked him for his work on behalf of the Division during the past three years.

10. Paul Yates reported on the meeting of the EuCheMS Executive Committee held in Brussels in April. Items discussed had included the website, the incorporation of EuCheMS as an association, and the status of the logo.

11. Paul Yates reported on the sessions being held jointly with the Working Group on the History of Chemistry as part of the First European Chemistry Congress (<http://www.euchems-budapest2006.hu/>). There would be two sessions of 1.5 hours each, with the second being the responsibility of DivCED. There would be two plenary lectures of 30 minutes each followed by 30 minutes discussion. He would continue to liaise with Ernst Homburg of the History of Chemistry Working Group and they would be requesting contributions to the poster session in September. Paul Yates agreed to write to Uri Zoller to decline his kind offer of a plenary session. It was suggested that this communication could include mention of the next ECRICE.

Action: Paul Yates

12. Zoltan Toth presented a paper which summarised the current status of the organisation for the 8th ECRICE (<http://www.ecrice8.mke.org.hu>) which is planned to follow the First European Chemistry Congress in Budapest. He thanked the members of the Scientific Advisory Committee who were present for their suggestions. Rysard Janiuk and Ilka Parchmann accepted invitations to speak. Peter Childs suggested that keynote lectures should be 25 minutes long with 5 minutes allowed for questions, and that the venue for the meeting should be as close as possible to that of the Congress. Zoltan Toth reported that the website for the meeting is under construction, and that the registration should be not more than €200 with a lower fee being charged for schoolteachers. There was some discussion about designating this meeting as ECRICE only, and Peter Childs suggested that the name ECCE be dropped from this and subsequent meetings. He agreed to formulate the remit for this and other conferences and to circulate this for comments. He thanked Zoltan Toth and the local organising committee for their work to date; it was agreed to pass updated information to Paul Yates for circulation to Council.

Action: Peter Childs, Zoltan Toth

13. Martin Goedhart reported that he had discussed the idea of a special issue of the International Journal of Science Education with John Gilbert, who was sceptical as he felt that there was little research of quality in chemical education. Peter Childs suggested that a special issue of Chemical Education Research and Practice might be more appropriate; Ilka Parchmann suggested that this could follow the next ECRICE, but would need to have a suitable topic and be planned well in advance.

14. a. Peter Childs suggested that the Division could adopt the Eurovariety conference which could be held in alternate years from ECRICE which has a different focus. June or July was suggested as a suitable time for this meeting. Paul Yates pointed out that that the "Variety" brand belongs to the Tertiary Education Group of the Royal Society of Chemistry and that it would be necessary to have this group's approval. Peter Childs agreed to discuss this with Stuart Bennett. Hana Ctrnactova offered to host a Eurovariety meeting in Prague in 2007.

Action: Peter Childs

b. Iwona Maciejowska stated that she felt it would still be valuable to produce a handbook for conference organisers. Paul Yates reported that he and Ray Wallace had produced some ideas on this and agreed to assist.

Action: Iwona Maciejowska, Paul Yates

c. Marek Frankowiz reported that he had access to a network which could potentially be used to activate countries in Eastern Europe. The next meeting is to be held in the Ukraine.

Action: Marek Frankowicz

d. Peter Childs stated that he felt it would be useful to produce a series of case studies. Reiner Saler reported on the experience of the Division of Analytical Chemistry. Ilka Parchmann reported that there were already activities in this area at secondary level through ESERA.

e. Marek Frankowiz stated that one of the important activities for the Division was collecting and shaping information on the website.

15. Liberato Cardellini expressed his concern about a decreasing interest in chemistry among students. Several delegates presented a more positive view of chemistry education in their countries. Martin Goedhart noted that chemistry topics were spreading into other sciences and that student numbers were increasing in the Netherlands. Mariann Holmberg reported that chemistry was now included at primary level in Finland and that this would hopefully increase interest. Student numbers were also increasing in Germany, and Ilka Parchmann noted that there were many opportunities for students to visit universities and research centres. She also drew attention to the EU High Level Group on increasing resources (http://europa.eu.int/comm/research/conferences/2004/sciprof/pdf/final_en.pdf). Reiner Salzer noted that 90% of employment opportunities in Germany were with small and medium companies who are not effectively represented. Marek Frankowicz reminded delegates of the ChemInsight Website (<http://www.cheminsight.de>) produced by the ECTN Image of Chemistry working group. Iwona Maciejowska reported that competitions are organised for Polish children in physics. Jean-Louis Rivail reported that John Holman would be talking to the French Chemical Society in September. Vojin Krsmanović informed delegates that up to 10% of students in Serbia and Montenegro were from Greece as the cost of education was cheaper. Only a third of students entering chemistry proceeded with the discipline. Jens Josephsen reported that there are many initiatives in Denmark, but that courses with other names are more attractive than those containing chemistry.

16. Details of progress on implementing the Declaration of Bologna are contained in reports from individual countries (item 17).

17. Full reports on activities in chemical education in individual countries is given on the Division website (<http://www.euchems.org/Divisions/DivCEd/delegates.asp>). Summaries are given below:

Czech Republic: In 2004/05, Division of Chemical Education of the Czech Chemical Society participated in chemical education activities in Czech Republic and abroad. The main activities were the organization of 3 conferences and 4 seminars; participation of our members in 4 conferences and symposia abroad; cooperation with universities, secondary schools and primary schools; participation in chemistry teachers' courses and the Chemistry Olympiad in the Czech Republic.

Denmark: The upper secondary school is preparing itself intensely for the major changes for students beginning in August 2005. The three year curriculum will be organised with half a year of introduction common to all (including "Understanding languages" and "General introduction to science" elements) followed by two and a half years with compulsory subjects and elective subject-packages with or without chemistry. Also the university reform implies that the Bologna process' 3+2 Bachelor/Master structure will be fully implemented with some trends pointing towards "national curricula", other trends pointing towards individualisation. Chemistry departments at universities are involved in open house arrangements preferentially for upper secondary school students. The young Danish Division of Chemical Education has arranged meetings during the year and co-operates with other divisions of The Danish Chemical Society and with The Division of Physics Education. The Chemistry and other Science departments at the universities are becoming smaller as a result of the progressively smaller enrolment in science in recent years. Until now, no chemistry department has been closed down. A new journal in Danish for science and mathematics education has been initiated.

France: The most noticeable event during this year has been the end of the implementation of the Bologna process in the French Universities. The National Olympiads and the preparation to the International Olympiads are still quite active in the whole country. The annual JIREC meeting (research and innovation in chemical education) was organised in the form of a joint event with the MIEC meeting (computer assisted chemical education). Finally, the various national bodies related to chemistry were brought together in the "Pasteur Conference" initiative aimed at the primary schools.

Germany: Following the Bologna process, the development and accreditation of Bachelor-Master courses at German universities have been completed or are currently in progress. The GDCh strongly supports the Bologna process. In 2004, the GDCh and the Association of Chemical Industries (VCI) published a recommendation on Bachelor and Master degrees in chemistry. With support of the Federal Ministry of Education and Research (BMBF), a first Bologna seminar "Chemistry Studies in the European Higher Education Area" was organised in Dresden. About 30% of the German universities and universities of applied science have changed their courses by now. The international recognised Bachelor and Master degrees will be established all over Germany by 2010. The two-stage system will offer a wide range of flexible study programmes to students as well as to professionals, according to their particular needs for qualification. For teacher education, which is based on special university courses in Germany, structures differ between universities. Regarding science education at schools, the development of unique standards for all states could have an effective impact, if they were implemented successfully. These standards describe expected learning outcomes on a fairly general level. Certain follow-up measures will become necessary, such as the development of new curricula, in-service training courses for teachers or the design and analysis of research studies offering insight into students' development of competencies. Another important development in school education is the implementation of science and technology in the school years 5 and 6. Different states have developed different course structures, some taking up the idea of integrated science courses, others teaching separate subjects. A paper developed in the name of the division of chemical education of the German Chemical Society offers further advice for teachers and curriculum developers for the early beginning of secondary science. The linkage between universities, research centres and school education is still highly supported by the GDCh and the VCI.

Greece: The Greek government passed recently a law for the assessment of Greek universities in line with European education policies. Early in 2005 a national dialogue on education, dealing with educational issues at all levels, was initiated by the Greek government within the National Educational Council. A new system of university entrance selection/examinations is under study within the national dialogue on education. The main problem with chemistry is that it is not tested nationally for students of the 'Technological Stream' through which students can enter any science (except biology), engineering, and agricultural studies department (including chemistry and chemical engineering). As a result in over 150 Greek tertiary departments for which chemistry is a prerequisite subject, students enter without chemistry. It is hoped that the restructuring of the system will restore chemistry in its proper place in secondary education. In two national conferences, one on science education, the other on chemistry, chemistry education had an eminent position. The

2005 National Chemistry Conference will be organised by the University of Ioannina next September.

Hungary: The new system of the two-level national final examination was introduced at the end of this academic year. This system has positive influence on the chemical education: It emphasises the importance of chemical experiments carried out by students, the every day and environmental aspects of chemistry, and the interpretation of read text with chemical content. Hundreds of chemistry teachers were trained for preparing and examining students in the new final examination system. The BSc programmes for chemistry and teacher training were developed in line with the Bologna Declaration and accredited for 6 semesters (180 credits). The Hungarian Chemical Society created a fund for supporting the participation of young chemists at international scientific conferences. One company from the chemical industry funded prizes for awarding chemistry teachers. The position of chemistry teaching, especially teacher training and the chemical didactics at the universities is getting worse because of increasing costs and decreasing the number of students.

Ireland: The most important development this year has been an increased emphasis on science education research involving researchers in third level institutions and teachers. There have been three important conferences relating to science education this year, as described below. In addition the latest results from the PISA project were released, comparing performance in English, science and mathematics in 2003 across the OECD countries (http://www.erc.ie/pisa/PISA_publications.html). The 2006 survey will focus on science achievement. Results of the Relevance Of Science Education (ROSE) project were also released which looks at students' understanding of the relevance of science education (<http://www.ils.uio.no/forskning/rose/>). The Government Chief Science Adviser, Dr. Barry McSweeney was appointed in Nov. 2004 and is making his mark by a series of recommendations and speeches on science and science education (<http://www.c-s.ie/office.html>). This is one of the few recommendations of the Task Force on the Physical Sciences to have been implemented (which reported in 2002).

Israel: In contrast to the decreasing interest in chemistry in Europe (see e.g., the Annual National Reports of 2004 by our Division of Chemical Education Council members), the number of those studying chemistry in Israel's universities is stabilizing, following a meaningful consecutive increase in the 2000-2004 period. This state of affairs has nothing to do with neither the Eurobachelor framework (ECTN initiative), nor the Declaration of Bologna (targeted at the creation of open European Higher Education Area).

Italy: 15 major events took place in chemical education; many efforts were directed toward the improvement of science for the primary school and to follow up and professional training courses (cooperative learning, peer education, laboratory) for teachers of primary and secondary level. In addition, the IV National Conference on the teaching of Chemistry took place (Assisi, December 2004). In Italy, a major reform for high school is taking place; the Italian division of Chemical Education was involved in the preparation of the specific learning goals (Obiettivi Specifici di Apprendimento, OSA) for secondary level of education (Licei).

Netherlands: It seems that the decrease of the numbers of students enrolling in chemistry in higher education has stopped: in 2004 the number has slightly increased

for the first time in many years. It is too early to conclude that this is a structural development and that efforts by government and organisations like the KNCV were successful. Nevertheless, also in 2004 many efforts of the Dutch government, chemical companies and the KNCV were aimed at increasing the interest of young people for a career in chemistry, or more general, for careers in science and technology. In its initiatives in education, the KNCV collaborates with the Netherlands Association of Chemical Industries (VNCI) and the Association of Science Teachers (NVON) in the Communication Centre Chemistry C3 (<http://www.c3.nl>). The C3 foundation promotes chemistry to the public and to pupils at the primary and secondary level. The most important activities by the KNCV in the field of chemistry education in 2004 were:

- Contribution to the stand on the National Education Fair and the website 'feel the chemistry', which aims to inform secondary school students about career opportunities in chemistry.
- Hosting an internet database to provide secondary school students with ideas for research projects.
- Organization of a poster presentation contest for university master students and polytechnics students.
- Awarding the best thesis written by polytechnics students
- Initiation of a discussion among organisations of engineers, mathematicians, physicists, chemists and biologists about the future of science and technology in Dutch education (from primary schools to university).

Poland: In 2004 some works were undertaken to change the core curriculum of general education also for chemistry education in junior and senior secondary schools. This year the new national senior secondary school final exams supervised by the Central Examination Board have been held. Chemistry is one of the subjects that can be chosen and taken on basic or advanced level. The successive conference of the Polish Chemical Society was held on 12-17 September, 2004 in Wrocław which included the "Education in Chemistry" section. "Science Days" have been organized in many university centers in Poland for several years.

United Kingdom : The Tomlinson report proposed a new framework which includes a common format for all 14-19 learning programmes. The House of Commons science and technology committee held an inquiry on *Strategic science provision in English universities*. The Education Division of the RSC held a symposium entitled "Art, History and Chemical Education" incorporating the Nyholm Lecture *Where Chemistry Meets Art: The Element Connection* by Professor Zafra Lerman of Columbia College, Chicago, USA. Fifty 15 year olds attended each of eight residential chemistry camps held at universities across the country organised by the Salters' Institute. Twenty undergraduates were entered for the best chemistry prize of the Science, Engineering and Technology Student of the Year Awards. The School Science Service was commissioned by the RSC to produce a report entitled *Laboratories, Resources and Budgets*. The Science, Engineering and Manufacturing Technologies Sector Skills Council organised a meeting to discuss what employers of chemists required in graduates. Representatives of the RSC and the Higher Education Funding Council for England attended "The Europe of Knowledge 2020: A vision for university-based research and innovation".

Reiner Salzer drew attention to the report on the Dresden Conference, and Ilka Parchmann noted that copies may be obtained from the e-mail address given in the report. Peter Childs noted the 25th anniversary edition of Chemistry in Action.

18. Peter Childs asked delegates who had attended other chemical education meetings to submit a review to the secretary for circulation.

Action: all delegates

19. Collaboration with other chemical education bodies was dealt with under items 20 and 21.

20. Peter Childs reported that the IUPAC Committee of Chemical Education (<http://www.iupac.org/standing/cce.html>) has circulated a series of Belgian overhead transparencies to third world countries. The images may be available on their website or on a CD.

21. Paul Yates reported that the ECTN working group on Newly Appointed University Chemistry Teaching Staff had held a successful summer school in Malta. Peter Childs mentioned that another group was developing links with schoolteachers. (<http://www.cpe.fr/ectn-assoc/network/index.htm>)

22. Peter Childs reported that Chemistry Education Research and Practice had now merged with University Chemistry Education and was being produced by the Royal Society of Chemistry 4 times a year. It publishes papers on both research and practice. (<http://www.rsc.org/education%5Ccerp%5Cindex.asp>)

23. Ryszard Januik reported that the IOSTE meeting would take place in 2006 in Malaysia (http://www.modelab.ufes.br/ioSTE/next_symposia.htm). Peter Childs reported that the ICCE would take place in August 2006 in South Korea (<http://www.19icce.org>). Ilka Parchmann reported that the ESERA meeting would take place in Barcelona in August 2005 (<http://www.esera2005-cresils.org>). Reiner Salzer reported that Education in Analytical Chemistry would take place as part of Euroanalysis in September 2007 in Antwerp (http://www.dac-euchems.org/euroanalysis/euroanalysis2007_stadscampus.pdf). He also invited comments on the mathematics and physics requirements for chemistry published on the Division of Analytical Chemistry website (<http://analyt.chm.tu-dresden.de>). Peter Childs asked people to send information to Paul Yates for dissemination, and Martin Goedhart suggested advertising Eurovariety to other divisions. It was noted that other EuCheMS divisions frequently hold annual conferences with sessions on education.

Action: all delegates

24. The next meeting will be held on Saturday 2nd September 2006 in Budapest.

25. There was no other business.

26. Peter Childs thanked Iwona Maciejowska, the Faculty of Chemistry and the Polish Chemical Society for making the arrangements for the meeting. He expressed the hope that the Eurovariety meeting would be a great success.