IUPAC COMMITTEE ON CHEMISTRY EDUCATION

Beijing General Assembly, 2005

MINUTES

Meeting times:

Monday, August 15	9:00–12:30 and 14:00–17:30
Tuesday, August 16	9:00–12:30 15:15–17:30 (+CHEMRAWN+COCI)

1. Apologies, welcome, introduction, and orientation

Present: Peter Atkins (chairman), Peter Mahaffy (chairman PUC), Elisa Maia (secretary), Warren Beasley, Masato Ito, Lida Shoen, Natalia Tarasova, John Bradley, Matti Näsäkkälä, Terence Mitchell, Peter Childs, Choon Do, Eva Akesson, Anthony Ashmore, Ludo Brandt, Mordechai Livneh, Morton Hoffman, Jung-Il Jin, Christopher Brett, Mukund Chorghade, Nicola Senesi, Ture Damhus, Maria Fátima Silva, Chris Ober, Roger Smith, Richard Layfield, John McQuillan, Werner Mormann, Jean Pierre Vairon

In attendance: Mohammed Alam (UNESCO) and Alex Pokrovsky. Peter Childs was also representing the Education Division of FECS. Several Young Observers from different countries were present: Nick Walker (UK), Salete Queiroz (Brazil), Katherine Holt (UK), Andrea Jackson (UK), Victoria Cornelius (UK) Bill Carroll (US), Megan Rosborough (Canada), Arun Chatttopadhyay (India)

Apologies: Ram Lamba, Alvaro Chrispino

Introductions: Members introduced themselves. The Chairman noted and welcomed the presence of new TMs/NRs. The current membership was noted

[CCE/2004/001]

Congratulations were given to Lida Schoen for being made Knight the Order of Orange and Nassau by the Queen of The Netherlands for her work in Science Education. A tibetan YAC t-shirt was offered by Petter Mahaffy.

Orientation: No matters not included in the agenda were proposed.

Noted that in the course of the meeting we could expect visits from the President, the Vice President, the General Secretary, and the Treasurer.

2. Minutes of meeting August 2004, Istanbul

CCE2005_002

2.1. Minutes were accepted with a correction: the name of John Bradley should

be included in the present list.

[CCE/2004/02]

3. Matters arising from the minutes

The off year meeting in Istanbul was considered too short. A longer meeting was suggested for Seoul in 2006.

About N 13 in the minutes - *La chimie et les Jeunes* [Guy MARTENS, Belgium]. Lida Schoen reported having tried to establish contact with the group without success. Ludo Brandt offered to try again, as he has some possible contacts.

4. Minutes of strategy meeting, Puerto Rico 2005

CCE2005_003

4.1. Noted

4.2. The strategy meeting, reported by Peter Atkins, was considered very useful. Individual matters arising to be discussed later during this meting.

5. SYMPOSIUM A: Chemistry for Development: The state of play

CCE2005_004

Noted that the purpose of this Symposium was to receive reports on the issues concerning member countries and to explore how the CCE might contribute in order to develop the possibility of projects emerging. Contributions from NRs (and others) were received. As there were several contributions, care was taken to control the time of each presentation to no more than 5–10 minutes.

The contributions for this symposium were from all the participants around the table. Participants gave some information about chemical education in their own countries. However, one of the themes most often focused was the Bologna Process.

- The first contribution was from Elisa Maia who reported about the European Leonardo da Vinci Project called CHLASTS – Chemical Laboratories Safety Training System already reported in the Istanbul meeting. The Project is now almost finished and the materials produced will soon be available in the Projects Web Page http://www.CHLASTS.org. The products include booklets, posters, leaflets, CD Rom, a DVD, and a web page. Besides these materials an exhibition about safety in Chemical Laboratories, as well as at home, will open in December in the Science Museum in Lisbon.
About the situation of Chemical Educatio in Portugal Elisa Maia mentioned that there were new reforms (again) of secondary/basic schools and at the Tertiary level the Universities were changing the structure of graduations and post-graduations in order to adapt to the Bologna process.

- Lida Schoen referred also the adaptation to Bologna process in the Netherlands

and about the importance of attracting good students to Chemistry.

- Terry Mitchell explained the Bologna process mainly to the non European participants. He also reported that the EU project "Tuning Educational Structures in Europe", now in its third and final phase, will be exported from autumn 2005 as Tuning America Latina to the whole of that region. How many subjects he does not know, but it was the clear wish of the people in Latin America to have chemistry as one of the disciplines, though this was not originally foreseen.

- From Australia, Warren Beasley mentioned the decline of the number of students in Sciences, in general and Chemistry in particular. There is also a decrease in people interested in research on Chemistry. There is a need to rethink the traditional way of studying Chemistry, and the interface secondary /tertiary is a point in the national agenda.

- In the UK, as Tony Ashmore referred, there has been a large input of money in education and research, but there are some complains that the effects of that are not seen. The number of students is about the same but there is increase in the recruitment of teachers. There is also a large effort of the RSC with courses, and different kinds of approaches in different media.
There are new curricula more appealing but in higher education there is a decrease of number of students in Chemistry, and this implies a reduction in the number of institutions where Chemistry degrees are offered, and a concentration of Masters and PhDs in only some Universities.
The Bologna process is in discussion.

- In Denmark there is a change in curricula with the possibility of choosing different matters, and less chemistry. There is little investment in fundamental research in chemistry except in nano or bio. Bologna process is also in discussion.

- In Japan, as reported by Masato Ito, the situation is similar to Denmark with decrease of science in primary and secondary education. There is a deterioration of the knowledge about science and chemistry in particular. In teacher training the balance between science and pedagogy is shifting to pedagogy.

- In Korea, according to Choon Do, there is the celebration of the Year of Physics. IUPAC should recommend the Year of Chemistry in 2007 with celebration of Mendeleev centenary.
In Korea there is the promotion of Olympiads, and there are many changes in the curricula of many courses. And a poster competition on a chemistry subject will be launched again.
Before the ICCE in Seoul next year, there will be a National Conference on Chemical Education

- In France, as reported by Jean Pierre Vairon, in the University things are changing in structure and contents to adapt to Bologna. The image of Chemistry is bad and it and Chemistry is considered mainly a tool for other domains of knowledge. There is now a project to develop the Chemistry of polymers in the francophone community.

- Germany had the Year of Chemistry in 2003. Teacher training is changing. The number of students in Chemistry is slowly increasing but their level is perhaps a bit lower. The introduction of interdisciplinary courses with the word bio seems to have brought more attraction to the courses.

- The situation in Africa is quite different. In South Africa, as referred by John Bradley, the number of students is increasing, but this is because the level of schooling is increasing. Like in other places there is an attraction for bio and nano. Performance tests show that the level of knowledge is still lower in Africa. Lack of qualified teachers /professors. Lack of capacity is the problem in the science teaching system – number and qualification of teachers of the different levels. The number of teachers is not increasing due, on one hand to AIDS and on the other hand to the attraction of the industry that pays higher salaries. There is a great challenge and great opportunities for development, but it is very difficult. In other neighbour countries the situation is much more difficult because the lack of capacities is aggravated by the lack of money.

- Peter Childs reported on the situation in Ireland where the internal revenue increased significantly in the last decades. The pharmaceutical industry and other industries developed and employment increased. There was a great investment in education, and in R&D, however there is still lack of qualified personnel, and there is importation of qualified personnel from Eastern European countries. Teacher training has improved and there are partnerships with research that allow secondary school teachers to work in research laboratories during their vacations.
Even so there is worry with the lack of interest of students in science. There were working groups studying this situation, but not many concrete measures were taken.

- In the US the different states have control on their secondary education and teacher training. Situations are very different from state to state. For example in some states there are religious pressures in order not to teach evolutionary biology. Anyhow there is an overall increase in the qualifications – specific qualifications – required in teacher training.
ACS programs now promote interdisciplinary aspects. There are changes in curricula, and in the teaching system.

Eva Akesson reported about changes in education in Sweden. The Bologna process is in good progress: A bill *New world – new university* was presented in June this year. The bill focuses on Bologna process, internationalisation and widening participation. A new degree structure, with three cycles, will be implemented by 1 July 2007 in Sweden. This means that all institutions for higher education are deeply involved in implementing the Bologna process in the two coming years. Fewer universities in Sweden offer degrees in chemistry due to fewer students willing to study chemistry as major and limited financial resources. Chemists who just have finished their studies seem to have difficulties to find jobs. It cannot be said if this is a temporary dip in job opportunities or a trend that will continue down. It would be important to have a discussion whether it really is a shortage of chemists worldwide, where the

surplus or deficit is in the different regions globally. Two other issues are the gender differentiation – about the same numbers male/female as students but much less than 50% women as Professors. The other problem is the difference between number of students and number of jobs. Eva also mentioned that at the University there is now a policy that for obtaining a permanent position at the University, there is the need to get educational training.

In Russia, as Natalia Tarassova reported there have been reforms in education, that establish less hours of classes and so less time for chemistry too. The decrease in the number of class hours is a consequence of less health of the children. The solution for the government is not to have more health care for mothers and children, but to decrease the number of classes.
The good news is that the school manuals are now controlled by the Academy of Sciences. Russia has now too many scientists as compared to the number of places at Universities – this is leading to a privatization of Universities. The privatization of the Academy of Sciences has already been mentioned.
The number of students of chemistry is not decreasing as there are well paid jobs after the degree. But the level is now less controlled by the Universities as there are written admission exams in the schools instead of oral admission examinations in the universities where students would like to apply.
The Bologna process is also now in discussion in Russia.

In Canada several provinces have implemented legislation giving right to professional title to chemists, with implications for the postsecondary educational system.

Terry Mitchell informed that the EU project "Tuning Educational Structures in Europe", now in its third and final phase, will be exported from autumn 2005 as Tuning America Latina to the whole of that region. He does not know how many subjects, but it was the clear wish of the people in Latin America to have chemistry as one of the disciplines, though this was not originally foreseen.

6. SYMPOSIUM B: Public Understanding of Chemistry: The state of play

CCE2005_004

Noted that the purpose of this Symposium and the methodology followed were similar to those of Symposium A. Again the time allowed to each speaker was controlled. Actually, the contributions were often for both symposia together, without explicit separation.

Lida Schoen reported that in the Netherlands many activities to promote Chemistry are currently undertaken. There are many activities involving schools and the Chemical Society. Actually Lida is directly involved in many of these activities what was, as mentioned before, the reason to be honoured by the Queen.

Nick Walker made the point that young chemists find it difficult to engage in public understanding work, because we are instructed to devote all energies

toward research. There is little reward for those who do in terms of career opportunities.

In the US there is a National Chemistry Week, in October, organized by the ACS. One of the activities is the Chemistry of Toys.

In Denmark each chemical company has to have a special budget to present chemistry to the public.

Ludo Brandt considered that although chemical societies , chemical industry , and all kind of governmental organisations has done enormous efforts in the past to improve the image of chemistry , one has to admit that until now this actions have not been an overall worldwide success . In most countries the general public remains very sceptical and even opposed to ‘chemistry’ and not only to its applications and uses but even to the value of chemistry as a science itself. Chemistry is generally defined as 'to difficult to understand and dangerous'. One of the main reasons is the lack of compulsory elementary chemical education in the educational systems of many countries. In most countries chemistry has been taught as a compulsory subject only in the scientific oriented study options in schools for general education, for the ages 14 - 18. In most study options of technical and vocational schools chemistry is taught sometimes as a part of some kind of general or applied sciences science, but in many of this schools there is no chemistry at all !
Also in primary-basic schools (ages 7 - 11) chemistry is generally completely absent, even in so-called developed countries, mostly due to the lack of elementary chemical knowledge of the school teachers. These teachers got within their training period in the best case some experience in exploring nature at a macroscopic biological and geographical level, without any relationship to chemistry. This results towards a situation where millions of pupils, leaving school at the ages of 12-16 years, got no idea of basic principles of chemistry, and consequently they of course do not understand basic chemical phenomena in their future live. What is 'ununderstandable' is de facto also ‘dangerous’.

In Ludo Brandt’s view IUPAC -CCE , in collaboration with local chemical societies, should at least give much more attention to

- **worldwide statistics** about the teaching of elementary chemical principles as a compulsory subject in schools , especially in basic schools and in non-scientific oriented study options of secondary schools
- worldwide promotion and implementation of an official **IUPAC- list with the elementary compulsory chemical knowledge for everyone** (e.g. mixtures; pure compounds, atoms , molecules , periodic system of the chemical elements, law of mass conservation , chemical reaction as an energetic proces , equilibria between molecules , main compound classes , acid and bases , oxidation and reduction , combustion .....)
- contacts with local chemical societies and governmental authorities to implement **elementary chemical knowledge as a compulsory th**eme in the school curriculum for pupils in the ages 10 - 14 years.

As a curiosity it was referred by Natalia Tarassova that the Academy of Sciences of Russia has now a group that is aimed at studying “Pseudo science” and paranormal phenomena.

7. Chairman’s report to Council

CCE2005_005

This report includes the reports of the two subcommittees, which will be taken separately as the next item. The report has been drawn upon the basis of the reports of the chairmen of the two subcommittees. The CCE was invited to make suggestions before its presentation to Council as well as to discuss its content (except for items specifically arising later in the agenda).

No specific suggestions were presented at this stage.

8. Subcommittee reports

A. Chemistry for Development

Since CED chair Ram Lamba could not attend the meeting, the plans for this subcommittee (CCE2005_006) were presented by other members of this subcommittee and then discussed around the table.

There was the information that nothing had happened in relation to proposal of the Association of Chemistry Educators in Peru, as it had not been possible to establish contact, but it appeared that the situation could improve with new contacts.

The discussion of E-Quiz and of the Microscale Project were postponed as it was decided to discuss first the Flying Chemists Program (CCE2005_007)

There was a long discussion about this topic, first to clarify its purpose – The Flying Chemists are a response to a request from an institution/country for help in terms of chemical education. When there is a request, the Committee analyzes it and constitutes a task force to help, visiting the country, understanding the problem and proposing solutions. The travel would be funded by external agencies, but the local expenses should be supported by local organization.

This can be a joint program with other scientists in an inter-union collaboration. ICSU should be approached. The request has to come from a country, and if IUPAC would consider it relevant, ICSU could be approached to make joint program.

An important issue is to identify the relevant experts and to insure the quality of the experts. And so this has to be a project with referees, and the CCE has to be in collaboration with other divisions. In order to prepare the request, the local institutions have to prepare documents to be appreciated by the consultants. What means that for bigger projects it will take a long time.

The goals are good but the time frame can be complicated, as not only Chemical Education but other divisions should be implied.

A reverse process could be to bring local people, with a specific problem, to a given place where the matter could be solved. However it was argued that the presence of a foreign group of experts in a country could act as a catalytic process.

According to Pokrovsky it is a good program. There is already something of the sort with the BSP – Basic Science Program of UNESCO. However as an important aspect of this FCP is that the CCE helps in case it is asked, and does not take the initiative, he fears that we will not be asked.

Another point that was mentioned was that, in order to make things more efficient, the program has to be sub-regional and cover two or three countries, and not just one. It is easier to get money for groups of countries, and post war countries have more chances to get funding. If the FCP is to go ahead it would be important to have support of UNESCO, with the BSP.

This FCP is different from the workshops on “microscale chemistry ” organized by CTC, because it is the country that asks for help and the “product” which is distributed is virtual – it is a distribution of ideas and not equipments.

It was referred that the process is in evolution and it would be interesting to know what happened in a first implementation that was prepared for India with Ram Lamba and Peter Atkins.

P. Atkins reported that they stayed 2 days in Dehli with two groups of High school teachers, one with 700 (?) schools and the other one with 35 schools. He and Ram Lamba carried out workshops with these two groups. In both groups teachers said they did not know how to motivate students and also that they did not know how to teach outside their field. P. Atkins and R. Lamba stimulated the creation of groups of schools and make work books (that could be in the web). Several task forces with specific tasks were proposed and periodic reports were asked. Atkins and Lamba acted as catalysts to form the groups of schools. The real importance of this project is to catalyse the process of interaction.

The Project grew outside India to the regional subcontinent – India, Pakistan, Sri Lanka and Maldives.

There is a preliminary report by Krishna Sane about task forces on Curriculum Development and Assessment Tools.

About the other projects of Krishna Sane it was suggested to him to put together some separate projects he had proposed. One of these projects is the E- Quiz. There is a similar project in ECTN.

The Sri Lanka Conference is a proposal centered around a conference in 2006. The RSC has a strong section in Colombo and considers important to have a significant contribution for the reconstruction of Chemical Education after the tsunami.There was a great enthusiasm of teachers about this idea of the conference at tertiary level. A weekend in March 2006 would be an appropriate date. The aspects of funding and invitations of official entities have to be studied. The program will be done in Sri Lanka but it would be confined to tertiary education, with invited plenary lectures supported by external funding (RSC).

After this report and the related discussion the Flying Chemists Project was considered important and it was approved in general, with a careful implementation. Also, IUPAC should approach ICSU to join efforts for this project.

B. Public Understanding of Chemistry

(Note there is no CCE2005_008 in the papers previously distributed, but this corresponds to #3 of 003).

The report presented was first discussed in the meeting and then in the following day in the workshop presented by Peter Mahaffy and the poster presented by Megan Rosborough from Canada. It is important to clarify the confusion in nomenclature – Public Understanding, Public Awareness, Public Appreciation, and also to identify the relevant bodies in IUPAC interested in these aspects, including divisions, COCI and CHEMRAWN.

The document CCE2005_009 is an extensive important report on “Chemists and the Public: IUPAC’s role in achieving mutual understanding “ – Report of IUPAC Project #2004-047-0150.

In the discussion during the meeting several aspects were focused, starting with a point stressing that almost all literature on the subject comes from the developed world. Actually a question was posed – do all citizens of the world need to know chemistry? And at what level? The needs vary from place to place. Noticed also that only recently IUPAC started giving importance to it.

According to the report the literature is surprisingly negative about the effectiveness of attaining the public in general via media. It also says that formal education is important. Perhaps our ideas about communication have to be revised, taking into account the role of internet and science museums. There is also evidence that scientists do not have a clear idea of the way young people and general public view science.

Finally a discussion of the possible role of IUPAC and in particular CCE in the communication of chemistry was carried out. What projects can be proposed? The needs of both the developed and less developed world should be taken into account. It is important to approach the different Divisions and show that each project should consider public understanding of science and where appropriate

collaboration with CCE.
The evaluation of the projects by IUPAC should also consider this issue.

C. Microscale group

In his report on Microscale Chemistry (CE2005_010), John Bradley referred the plans to go on disseminating the concept and propagating the web site.
However he stressed that there is a reduction of funding after the retirement of Pokrovsky from UNESCO, and so that it is now more difficult to continue the project, although he is still interested in supporting the promotion of microscale chemistry.

9. Interaction with Divisions and Standing Committees

A Oral report from Chairman and Divisional Liaison Officer

Eva Akesson, as liaison officer is in charge of going around the divisions and identify activities and joint projects interesting for CCE. Peter Atkins and Eva Akesson approached all divisions and tried to remind them about the possibility of joint work. Some of them sent representatives to this meeting and will present proposals.

Some ideas were suggested
- materials chemistry
- experiments with high temperature
- core organic curriculum for Latin America – Why not also inorganic?
- nano science
- waste management
- intelligent experiments for kids
- bioinorganic chemistry

In the Polymer Division there is a subcommittee on education. They are very interested in education in this area and also in public appreciation of polymer science. They intend to do a CD and a web site. Joint work between this new subcommittee and CCE was proposed. For that CCE should be represented in this subcommittee by two persons – Choon Do and Peter Mahaffy were proposed and accepted.

Division VI – Environmental Chemistry might formalize collaborations with CCE on educational issues.

Division VII – Human health – interested in publishing books. CCE could be a window for promoting “megaphone” publications.

Division VIII is interested in the revision of principles of nomenclature and structures, with clear communications implications.

B Contributions from Divisional Representatives

Representatives of the Divisions were present and opportunities for collaboration were considered. Their presentations developed the points already mentioned above.

Div I (Physical and Biophysical). No report.

Div II (Inorganic) – Preliminary proposal of a core curriculum of Inorganic Chemistry for Latin America. There is already a group in LA to be part of the project. A suggestion was made of a contact of this group with ECTN. A core curriculum facilitates mobility. It does not mean a curriculum exactly the same in different countries, but it is an exercise on what should be common, meaning that the learning outcomes should be the same.
The participants to be involved in this project were not yet identified but it was stressed that they should be high quality experts . IUPAC should referee this whole proposal.

Bioinoganic Chemistry - preparation of a sort of glossary – atlas of active sites. CCE should be involved in this project.

Division IV (Macromolecular). Last year there was a conference where in the first part there was an overall view of the area and in the second part teaching materials and experiments were proposed. There is a project on e-learning on polymers, based on a CD distributed by the Plastic Centre (?). And there is a data base of all education materials on polymers.

Division V(Analytical) – Also interested in a core curriculum. Together with pesticides group they are interested in defining common standards of analysis for pesticides. There could be interest in the participation of CCE – PUC.

Division VI (Environment) – The division has 4 subgroups and there is much scope for collaboration with CCE, which hasn't yet developed.

Division VIII (Nomenclature) – produces the nomenclature coloured books. The Green book has a chapter related to education.

C Contributions from SC Representatives (COCI, CHEMRAWN)

There were no preliminary suggestions to present to the joint meeting of the three committees.

10. Review of Projects

A. Review procedure

The review procedure is reported in paper CCE2005_011.

No further comments were made.

B Project Budget

The Project Budget is detailed in document CCE2005_012. It was referred that for the biennium (2004-06) CCE has some money – 20 000 $US available for small projects, or to be used as "seed money" to start bigger projects. About 15 000 $US were already used and so only less than 5 000$US still exist.

C Current Projects

Choo Do reported that the Current Projects are those mentioned in document CCE2005_013, that also refers the expenses versus budget.

D Projects under consideration

No report

E Future projects

Before starting the discussion of future projects there was information presented by Peter Atkins about problems identified in a meeting in Xian before the GA. One of the problems was the difficulty in the use of English language by teachers. A discussion on the use of English followed this information as there is some suggestion that Chinese should move to have university classes in English in three years. In Europe there is already this movement and in several Master's courses classes are often taught in English in some countries. On the contrary, in North Africa where French was much used, there is a move towards the use of Arabic. The discussion about this issue also focused on the position of IUPAC: should the use of English be recommended? A proposal to send a letter from CCE to the Minister of Education of China to recommend the use of English in a three year delay was not sufficiently supported. It was decided to study this aspect of the use of English with more detail in the future and even to propose a project. There is already an European project on the use of technical English for teaching.

Another large discussed was focused on the possible collaboration with OPCW. In July 2205 there was a consultation between IUPAC and OPCW, in Oxford, to discuss a code of ethics and conduct of chemists about chemical precursors of chemical weapons. A group is preparing a project proposal for a workshop as part of a conference at Mendeleyev University in Moscow in November 2005.
In this project there should be a paragraph urging that education on the chemical weapons convention is essential. The convention should be known by students. An idea could be to encourage them to prepare codes of behaviour.
IUPAC will move in that direction but enlarging the scope of the subject from weapons to ethics in general.
ACS and the RSC already have ethics committees and guidebooks.
There is a great interest in the outcomes of the Moscow meeting about this matter.

Another future project mentioned was a project, already submitted to IUPAC on "Contributions of Arab Chemistry to the development of Chemistry in Europe" that proposes to organize a series of workshops located in the Mediterranean area to promote the research and further publication of materials on this subject. The contribution of Arabic Sciences is already well documented except in what relates to Chemistry that has still many aspects deserving a detailed study. In this project a tight collaboration of Arabic and European/American chemists is in the basis of the proposal.

11. *CI* and *CEI*

Masato Ito presented a detailed written report on the publication of Chemistry International and Chemistry Education International. The report is in annex.

12. Review of activities

A Current activities

1. YAC Program - CCE2005_014a,b,c

Lida Schoen reported about the YAC Program
In this program – Young Ambassadors for Chemistry – young people take an active part in the promotion of Chemistry. The idea started in Beijing with the poster competition - It's a Chemical World – and developed into a program with activities in a workshop involving students and teachers. The first experience was in Taiwan and the second one in Buenos Aires, Argentina. The program will continue in the near future in Russia and Korea.
A more detailed report is in the document referred above.

There was a suggestion from Mordecai Livneh to launch a poster competition every year. This could involve the NR that would carry out this competition at a national level. The results of the competition and the posters of the winners would be presented at ICCEs.

Choon Do remarked that he is organizing a national competition in Korea to present in next ICCE, but this involves an enormous amount of work and so is a problem.

3. Russian Clearing House - CCE2005_015
Note that there was no point 2 in the Agenda

Natalia Tarassova reported on this point. She is not directly involved, but is supervising the project. The Clearing House is a place where IUPAC products, translated into Russian, can be found. There is a site at Mendeleyev University where there are several documents translated. These documents are mainly for teachers. Some time ago a questionnaire was given to teachers in order to get information about what would interest them. This work was done in collaboration with the Ministry of education.

In the translation process, not only Russian is used, but there is a problem because in the languages of some of the Republics there are no equivalent words for some concepts.

In what concerns the sustainability of the process, Mendeleev University will go on supporting this web page of the Clearing House and the translations.

4. DIDAC - CCE2005_016

These materials, originated in Belgium, endorsed by CTC and then CCE, were distributed worldwide by UNESCO in around 60 countries, sent to the National Commissions (information from Alex Pokrovsky). However the National Commissions are not the users and they did not give information about the real users (if there are indeed). The materials consisted initially in a book and 5 big boxes with transparencies. This was a problem for distribution because of the weight. Now all those contents were put in a CDRom what makes the distribution much easier. To decide on the future of DIDAC within CCE framework it would be important to make the follow up of the users so that it would be possible to do an evaluation survey.

Warren Beasley, was in charge, after the Istanbul meeting, of studying the outcomes of the use of DIDAC already distributed. He reported that he tried to establish a network of users but could not get information from UNESC in order to do a data base of users. He never got a list of people/organizations to which it had been distributed. For him the “story ends here”. CTC/CCE endorsed the materials for its quality, but has no responsibility for the distribution.

Peter Atkins circulated a message to NRs but had no reply.

Ludo Brandt informed that in Belgium Agfa and the Flemish Society of Chemistry made 1000 copies of the CD and later on 500 more copies and distributed them in many schools. It was also suggested that the materials could be completed with other topics, like car industry, stereochemistry, etc
However it was argued that without a network of users/schools it is not easy.
If it is completed there will not be a new contract with UNESCO.

The distribution is now carried out in the Microscale workshops. Also the content of the CD is available in the Internet and can be downloaded.

The great barrier to this project seems to be the contact with UNESCO that does not reply. A working party was proposed to try to study possibilities for the project - Warren Beasley and Ludo will try again to contact UNESCO.

B Future activities

1. **Descriptors**
   CCE2005_017

Tery Mitchell supplied the paper mentioned above as a basis for discussion. The descriptors are in line with the process of harmonization of Universities in Europe with the Bologna process that should be concluded by 2010. There was a meeting of ECTN in Dublin where descriptors, independent of contents, were produced. They were adopted and the next step is to devise national frameworks for qualifications. There is the idea of defining general skills in Chemistry.

The descriptors will be presented to EUCheMS in order to be accepted at European level. Note that there is already the Eurobachelor in EUCheMS.

The descriptors prepared at European level may have to be changed for worldwide consideration. The role of CCE and IUPAC could be to transfer to a world level this set of outcomes.

To study this matter a task force was created, trying to join representatives of different regions – Morton Hoffman, Masato Ito, Tony Ashmore, Terry Mitchell and Warren Beasley. Their report should be presented in Seoul in the CCE meeting. In between the Committee should be kept informed of the progress of the situation.

13. ICCE programme

A - 18th ICCE Istanbul 2004

Hale Bayram who could not attend the CCE Meeting sent a complete report about the ICCE in Istanbul. (CCE2005_018). This report shows that there was a large international participation and a great number of communications.
The Committee considered the ICCE as very successful and congratulated Hale for that. Besides the Scientific program, the social program was considered very interesting and all the meals of high quality.

B 19th ICCE Seoul 2006

Choon Do prepared a short paper on the history of ICCEs and then he presented preliminary plans for next ICCE in Seoul in 2006. He also asked for collaboration in the selection of lecturers for the Conference. Members of CCE were invited by the Korean group to a reception to discuss more detailed plans.

C Future ICCE venues

i. Criteria of acceptance (CE2005_019)

Warren Beasley pointed out that for choosing new venues of the ICCEs some criteria should be observed. The document presented lists those criteria. First of all there are general criteria established by IUPAC, but we should also consider additional criteria, for example, related to geographical considerations. The map of former locations (from *CI*), was shown (CE2005_019a). From the map it is quite clear that the continent where there was only one conference is Africa (Cairo). And this could be an orientation for the choice of the next venue.

ii Selection of location of 20th ICCE 2008

There was some discussion about the selection of the location of the next ICCE. Two candidates presented proposals – Mauritius and Portugal. Both have advantages and disadvantages concerning different aspects. Mauritius is politically in Africa but CCE felt the need to ensure that benefits of the conference also acrued to sub-Saharan Africa. Portugal could be a good place, but it was considered that the proposal was not very sound, with extremely high fees and still an unclear definition of goals.

Having no more offers it was decided to accept tentatively Mauritius, on the condition that the ICCE be combined with other related existing events or organizing regional conferences/ workshops in neighbour countries, which are possible flight stops of journeys from other countries, namely from Europe and America.

D Usurpation of name ICCE

As it was already late and there was the need to finish the meeting this point was not reported, as the Chairman considered it not relevant.

14. Other Educational Conferences

Information about other Conferences will be put in the web by the Conference Coordinator, Warren Beasley, and updated quarterly (see point 15 B)

15. Administrative matters

A Finance

Project budget

Operation budget

Peter Atkins reported on the budget

B Roles of officers

There was general agreement on the roles of officers proposed in document CCE2005_20

C Membership

1. Titular members:

Eva Åkesson and Choon Do were accepted as new Titular Members to be proposed to IUPAC.

2. National representative of Japan

As an exception a NR for Japan was accepted although Japan has already a Titular Member. It was considered that Masato Ito has too much work with CI and CEI and so he needs the help of a NR for Japanese affairs. (CCE2005_021)

3. To note and thank retiring members of the committee.

The Chairman, Peter Atkins, and Elisa Maia, secretary, will finish this year their mandate. They were thanked for their lengthy and valuable service to CCE.

4. Future officers

The appointment of Petter Mahaffy was approved as Chairman. After approval by IUPAC he will make appointments to the appropriate vacant offices.

16.3 Next meeting

The next meeting of the CCE will take place in the course of the Seoul ICCE, August 2006

As the committee had found the agenda of Istanbul Off Year Meeting far too extensive for thorough discussion in the short time available at an ICCE, in the next ICCE in Seoul a full day will be reserved for the meeting of the Committee.

17 Any other business

There was no other business.

Respectfully Submitted,

Elisa Maia, Secretary