C_3 News

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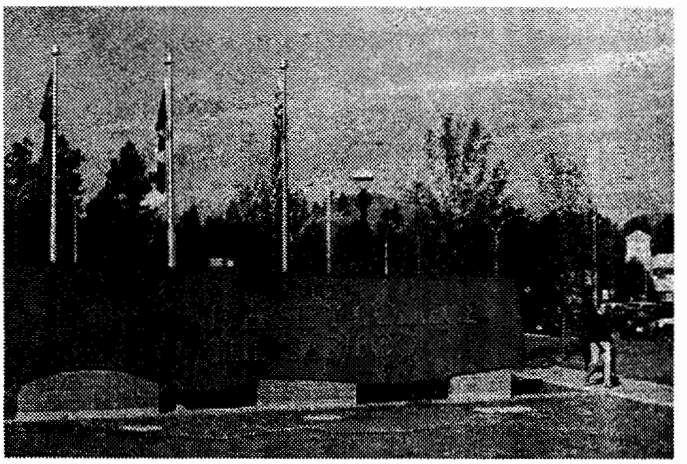
Newsletter of College Chemistry Canada/La Chemie Collégialle au Canada

C_3 2000 Conference Highlights

Doug Bickley

This year's annual conference, hosted by The University College of the Cariboo, in Kamloops, BC, was a great success. In addition to the usual chemical education emphasis, the conference theme was Chemistry and Water Quality. Excellent presentations and 60 enthusiastic attendees made for a memorable conference.

The Chemistry side of the conference included four plenary lectures, seven presentations, nine poster presentations, and two workshops. On the social side, there was the opening reception, the C_3 conference banquet, the annual Fun Run, an excellent tour of the Bear Brewing Co. facilities and products, and finally several tours of scenic and exciting areas near Kamloops.



On Friday, Professor Kristin Orians opened the conference with an outstanding lecture on The Chemistry of the Oceans. Stacey Jyrkkanen, a recent UCC graduate in Environmental Chemistry, employed at Neste Resins in Kamloops, presented a fascinating talk about the many facets of her job and the experiences of a new graduate in industry. Mark Freeburg, from Highland Valley Copper Mine in Logan Lake, BC, presented an interesting overview of their processes and some of the water quality issues they are faced with. On Saturday, Ariel Fenster presented a stimulating seminar about genetically modified food; is it a boon or a bane?

We also had excellent presentations over the two-day period from Sudhir Abhyankar, John McIntosh, Christina Jofriet, Bob Perkins, Marni Gillis, Andrew Mosi, Kelly Sveinson and Norm Reed; all the abstracts we received for the talks are included in this newsletter.

On Friday afternoon we held the poster session, with attendees discussing posters with presenters in an informal atmosphere catalyzed by the pre-Banquet bar. The conference banquet followed, during which the C_3 Student Scholarship was presented to UCC Environmental Chemistry student Karen Burkell. Karen is currently on a co-op work term and will be returning in the January 2001 to complete her courses and conduct a research project in soil chemistry. The banquet also featured drawings for a variety of UCC memorabilia.

Early Saturday morning, under a brilliant Kamloops sun, nine runners and walkers set on on the Fun Run, on a course designed by Ed Baron and Lyn Jessee. Bob Browne and John Olson tied for the coveted J. Willard Gibbs Trophy.

Following the AGM on Saturday afternoon, workshops on Chemistry Demonstrations and Chemistry and Chime were held. Thanks to Jim Davies and Dave Woodcock for so ably presenting these workshops.

The conference finished with a tour of Bear Brewing

INSIDE THIS ISSUE

C_3 2000 Conference Highlights 1

President's Report 3

From the editors 3

Icebergs, Life Savers, and Avogadro's Number ... 4

C_3 2000: Abstracts received 5

Chem Ed in Oz 8

C_3 Conference 2000 Summary 10

Contact Information 12

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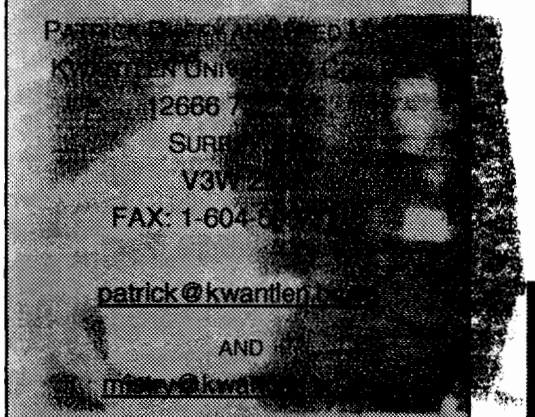

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Articles of any length will be accepted. Please send copies to the new editor, Norm Reed at nreed@cariboo.bc.ca in electronic format (preferably Microsoft Word) via e-mail or floppy disk, together with a hard copy mailed to the University College of the Cariboo (see Contact Info on last page of this issue), along with copies of any photographs.

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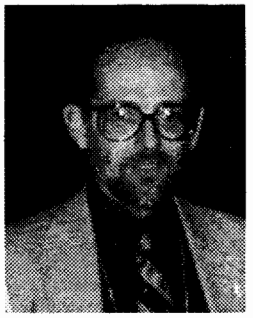
Co., BC's largest microbrewery. David Beardsell and Brian Keast from Bear gave attendees a fabulous tour of their facilities, a presentation about the importance of water quality in their business, and samples of their excellent products.

On Sunday the weather was perfect for several tours around Kamloops. Some people opted to take a (fantastic) tour of the unique La du Bois Grasslands led by John Karakatsoulis and Peggy Broad from UCC's Natural Resource Science Department. Others took a marvellous tour through Wells Gray provincial Park, led by Tom Dickinson from UCC's Biological Sciences Department. Several brave souls went whitewater rafting through Wells Gray Park on the Clearwater River. Everyone managed to return to Kamloops safe and sound.

Doug Bickley and Norm Reed organized the conference, and would like to thank everyone in the UCC Department of Chemistry and many other areas within UCC for their help and support. They would also like to thank W. H. Freeman, McGraw-Hill, John Wiley, Pearson Education Canada, PerkinElmer, and Bear Brewing for their financial support. Additional support from the UCC Public Relations and Vice-President, Instruction, offices as well as the UCC Bookstore is also gratefully acknowledged. ❄



President's Report

Bob Perkins

Well the rain is pouring down on July 2nd as I compose my report for this issue of C_3 News. I would like to start by extending my thanks to Doug, Norm and the rest of the organizing committee for a truly excellent conference at the University College of the Cariboo in Kamloops BC. The presentations were excellent, the conversations stimulating, and the hospitality first rate!! You will find a few pictures and summaries of some of the presentations in this issue. You should also check out the Web Site (http://www.cs.douglas.bc.ca/) for further details.

Our 28th conference next year in Montreal is going to be a new experience for us: a joint effort with the CSC at UQAM. You can check out the latest details at http://www.csc2001.chemistry.ca/. As you may recall reading in a previous issue of C_3 News, we are now able to attend the CSC conferences at a reduced registration rate as Affiliate Members of the Chem. Ed. Division of the CSC. You must be a member in good standing of C_3 in order to take advantage of this offer. Please send in your renewal cheques ($20 for C_3 membership + $10 for CSC Affiliate Membership) to our Treasurer (Jacky McGuire) as soon as possible. I would also urge you to consider submitting a proposal for an oral or a poster presentation at the conference in Montreal. Gary Wilson and Shahid Jalil at John Abbott College and Ariel Fenster from Vanier College will be our local C_3 contact folks for the conference. Stay tuned for additional details as they become available.

You should also be thinking about nominations for the C_3 Award and the C_3 Student Award. You can check out the criteria and deadlines at the C_3 Web Site.

Down Memory Lane

I have been thinking about the role of College Chemistry Canada a lot lately, and ways in which I might improve how it serves it. One of the most important functions this great volunteer organization serves is to play a vital role in keeping chemistry instructors across the country informed as to the state of the teaching enterprise from one province to the next. To help with this, we have compiled a master e-mail list of current and former C_3 members; I will be sending messages to that list on a regular basis. If you have any other instructors who would like to be added to the list, drop me a note.

The annual C_3 conference is also an important part of C_3's link to instructors. For the benefit of our younger members, here is a listing of the locations of our previous 12 conferences. Each one was unique and wonderful. The 1991 conference at Champlain was the only one that I missed. How many did you make it to?

1988	Seneca College	Toronto
1989	Mount Royal College	Calgary
1990	Capilano College	Vancouver*
1991	Champlain College	Quebec City
1992	Vanier College	Montreal
1993	Rhode Island College	Providence RI
1994	BCIT/OLA	Burnaby
1995	Heritage College	Hull
1996	Yukon College	Whitehorse
1997	Grenfell College	Corner Brook
1998	Medicine Hat College	Medicine Hat
1999	Loyalist College	Belleville
2000	UCC	Kamloops

*joint with 2YC3

I hope you all had a restful summer break and all the best for a productive fall semester of teaching!!

Bob Perkins

From the Editors

This issue, the fourth we've published, marks the end of our short stint at the reigns of C_3 News. We would like to welcome Norm Reed as the new editor of C_3 News who, we're confident, will bring a fresh perspective and keep C_3 members well-informed and interested in the organization.

We have gained valuable experience as editors of C_3 News. We hope that you have enjoyed our efforts and perspective and that we have helped uphold your interest in C_3, as well as maintain your contact with your colleagues in College Chemistry Canada. After all, that is one of the benefits of C_3 membership.❄

Pat Duffy and Fred Mistry

Icebergs, Life Savers, and Avogadro's Number

Bob Perkins

One of the desired student outcomes of the chemistry courses at our institution is the ability to use the various chemical handbooks to find information. I bring the CRC Handbook, Merck Index, and Aldrich Chemical Catalog to my classes on a regular basis and have students take turns looking up any facts when we need them in class. Cooperative learning is also important; being able to work as part of a team is a necessary requirement for joining the work force after leaving the college. As one of the teaching strategies in my courses, I will often set thought-provoking problems[1] that will require the use of these reference materials. I encourage the students to work in small groups to come up with a solution. Over the past few years there have been many published notes in the Journal of Chemical Education[2] and Chem 13 News[3-5] describing several ways in which the magnitude of Avogadro's number can be conveyed to students. I would like to present another one that combines several aspects of introductory chemistry and makes use of the problem-solving concepts discussed above.

Recent reports in the news have drawn attention to the reduced levels of ozone over the South Pole, as well as the warming trend leading to the breakup of some of the continental ice-sheet covering Antarctica. Massive quantities of ice have broken off into the ocean, and concerns have been raised regarding the possible hazards to shipping as these country-sized icebergs move north. All one needs is a source of thermal energy to melt the icebergs and the problem would be solved.

We were part way through our coverage of thermochemistry. We had just finished commenting on a newspaper article that had discussed an iceberg of dimensions 77 km by 32 km by 200 m. At this point, I posed the following question to my class of introductory chemistry students (they had had one year of high school chemistry): If one had an unlimited supply of Life Savers, would the combustion of a mole of them be sufficient to melt the iceberg ? I left the question at that and challenged them to come up with an answer for the next class.

The next couple of days were very interesting as various groups of students would drop by my office to discuss how they were tackling the problem, what additional information they needed, and what assumptions might have to be made to arrive at a solution. The following is a summary of the information required along with the results of the calculations necessary to obtain an answer.

Data Required by the Students

1. mass of Life Saver (assumption made that it was sucrose): 2.36 g
2. molar mass of sucrose ($C_{12}H_{22}O_{11}$): 180 g
3. ΔH_{comb} of sucrose: $-5461\ kJ \cdot mol^{-1}$
4. density of ice: $0.917\ g \cdot cm^{-3}$
5. ΔH_{fus} of ice: $6.0\ kJ \cdot mol^{-1}$

Values Calculated by the Students

1. energy released per Life Saver: 71.6 kJ
2. volume of ice: $4.93 \times 10^{11}\ m^3$
3. mass of ice: 4.52×10^{17} g
4. energy needed to melt ice: 1.51×10^{17} kJ (assume ice at 0°C)
5. number of Life Savers required: 2.1×10^{15}
6. amount of Life Savers: 3.5×10^{-9} mol

To melt that enormous block of ice, a total of only 3.5 nanomoles of Life Savers would be required.

I found the exercise to be extremely effective in conveying the magnitude of Avogadro's number to the class, as well as giving the students additional practice in unit conversions and using the chemical handbooks. I hope that other instructors will be able to make use of it with their students as well.

References

1. M. Naji, Chem 13 News, September 1993 (issue 223), p 14
2. D. Todd, J. Chem. Ed., **62** (1985) 76
3. A. Last, Chem 13 News, May 1990 (issue 195), p 6
4. R. DeLorenzo, Chem 13 News, September 1992 (issue 214), p 1
5. K. Brody, Chem 13 News, November 1994 (issue 234), p 7
6. M. Jansen, Chem 13 News, April 1995 (issue 239), p 5

27th College Chemistry Canada Conference

The University College of the Cariboo *Abstracts Received*

PLENARY LECTURES

Professor Ariel Fenster: McGill, University, Montreal, PQ

"Genetically Modified Food - Boon or Bane?"

To supporters, the genetic engineering of food is a scientific triumph that should benefit both farmers and consumers by improving nutrition with the introduction of super foods and protecting the environment by reducing pesticide use. To critics, these "frankenfoods" represent a frightening foray into the unknown with potential for major health problems and irreparable damage to nature. In this heated debate, the truth is hard to find. This lecture examines critically the various conflicting claims, and aims at providing the latest scientific facts on one of the most controversial issues of recent times.

Mark Freeburg: Highland Valley Copper Mine, Logan Lake, BC

"Water Quality Issues at Highland Valley Copper (How Cows, Plants and Bacteria are Helping One of Canada's Biggest Mines Prepare for Closure)"

Highland Valley Copper operates a large open pit copper mine near Kamloops, BC. Current plans call for the operation to close permanently in 2009, after almost fifty years of activity. Water management and water quality play an integral part of any mine at Highland Valley Copper. This presentation will describe the issues, the research, and what the future holds for the site and the receiving environment.

Stacey Jyrkkanen: Plant Chemist, Quality Control Manager and Information

Technologist, Neste Resins, Kamloops

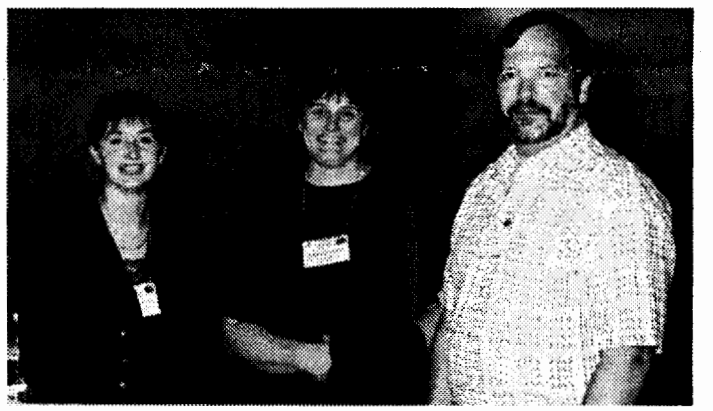
"A Brief Overview of Phenolic Resin Chemistry at Neste Resins - The Experiances of A New Chem Grad in Industry"

Neste Resins operates a phenolic resin production facility in Kamloops. These resins are used in the manufacture of plywood and for other industrial uses. This lecture will present the details of phenolic resin production chemistry. In additon, some time will be spent reflecting on the experiences of a new chemistry graduate working in chemical industry.

Dr. Kristin Orians: Dept. of Earth & Ocean Sciences and Chemistry, University of British Columbia

"The Chemistry Of The Oceans: Fe, CO_2 And Global Warming

Seawater covers 70% of our planet and holds a large portion of the CO_2 released by the burning of fossil fuels. The ability of the oceans to absorb this greenhouse gas depends on a number of factors, including the physical solubility of CO_2, the chemical interaction of CO_2 with water, and the biological uptake and transfer of carbon from the surface to the deep ocean and the sediments buried beneath the seafloor. The biological component of the carbon cycle is often referred to as the "biological pump" and depends on the rate of carbon uptake (primary production) and the amount of this carbon that leaves the surface ocean (export production). In most regions of the ocean, primary production is limited by nutrients (nitrate, silicate or phosphate), and in some cases by light or perhaps by grazing. In recent years it has been discovered that a trace metal, iron, exists at picomolar levels in the surface ocean and limits primary production in many of the areas where other nutrients are not limiting. In my talk I will present an overview of the carbon chemistry of seawater and some of the exciting recent work on trace metals in the oceans



Stacey Jyrkkanen (Neste Resins), Kristin Orians (UBC Depts. of Oceanography and Chemistry) and Mark Freeburg (Highland Valley Copper Mines), three of the plenary speakers.

and their influence on the biological carbon cycle.

LECTURES

Marni Gillis: Special Project Supervisor, City of Kamloops.

"Non-Point Source Water Polution in the Kamloops Area - The Work
Experiance of a Former UCC Co-Op Student and Recent Graduate"

The Kamloops area has a number of natural water collection systems which ultimately flow in to the Thompson River system. Household and industrial waste finds its way into the ground water system. Marni has studied this problem both as a former UCC Co-Op student, and now as a full time project supervisor for the City of Kamloops. Marni will be discussing the technical aspects of her work and relaying back to us some of her experiences as a recent UCC chemistry graduate.

Christina Jofriet: Instructor, Niagara College, Niagara Falls, Ontario

"Chemistry: The Center of the Universe for Field and Lab Technicians"

Chemistry is a truly interdisciplinary science! An appreciation for chemistry's relationship and interaction with many other disciplines is an essential concept that should be demonstrated to field and lab technician students in their course of study. Curriculum integration has proven to be a valuable tool in attaining this goal at The Centre for Environmental Training - Niagara College. Chemistry is vertically and horizontally integrated within the environmental technician program to increase instructional effectiveness, motivate the students and develop the skills necessary for today's work world.

Dr. John S. McIntosh: Dept. of Physical Sciences and Engineering, UCC.

"Quantitative analysis of Cu, Se, or W based on a catalytic reaction and a flow-injection analysis strategy. A simple, robust instrumental analysis laboratory exercise suitable for a third year instrumental lab or a second year introductory analytical course."

Continuous flow analysis in analytical chemistry was originally introduced as a means of automating routine, repetitive, "wet chemistry" assays. As this strategy gained wider acceptance, clever innovations in continuous flow techniques have produced rapid, microscaled, quantification for an incredible range of analyte species. Continuous flow techniques, particularly the non-segmented method known as "flow-injection" analysis (FIA), have become wide spread in industrial analytical settings and in commercial analytical laboratories. Curiously, in college & university based analytical chemistry courses, few student-based laboratory exercises exist to demonstrate the wide applicability of FIA in determining analytes in aqueous solution.

We present here a simple, robust laboratory exercise suitable for a third year instrumental lab or a second year introductory analytical course.

Using flow-injection analysis coupled with a catalytic enhancement of the ferric/thiosulfate redox reaction, selective high precision quantification of copper, selenium, and tungsten analytes in aqueous solution can be demonstrated using inexpensive, commonly available reagents.

Dr. Bob Perkins: Dept. of Chemistry, Kwantlen University College, Surrey, BC

"What Am I? An Open-Ended Examination Question"

The same molecular formula can represent many different isomeric structures. I will provide examples of different examination questions which I have used to probe the students' understanding of a variety of concepts.

Dr. Norman Reed: Dept. of Chemistry, UCC, Kamloops, BC

"Benzylic Directed Lithiation Reactions - Student Designed Experiments for Advanced Organic Chemistry Labs"

Directed ortho-lithiation has, over the past twenty years, developed in to an indispensable tool in aromatic ring substitution chemistry as a complement to classical electrophilic substitution, both in academics and industry. In addition, the lateral or benzylic version of the directed lithiation reaction is also a powerful, but less utilized, synthetic method. There are so many examples of the practical use of this reaction in synthesis now that it is important that this class of reaction receive at least some coverage in advanced synthesis courses at the undergraduate level. This talk will give a review of the past and recent history of these reactions. Some recent fascinating stereochemical results will be discussed. Most importantly, the author's efforts to introduce a laboratory study focused around student designed experiments on these reactions will be presented.

LECTURE AND POSTER

Dr. Andrew Mosi: Chemistry Instructor, Langara College

"The use of portable water analysis kits for teaching water chemistry in both the classroom and in the field."

As part of the Environmental Studies diploma program at Langara College students are required to take a one semester Field Studies course that is jointly taught by the Chemistry, Biology and Geography departments. The chemistry component focuses on the chemical analysis of water. The student's knowledge of chemistry and laboratory techniques varies significantly. Consequently, the course has to be taught assuming little or no prior chemistry knowledge. In order to enable all students to perform water analysis, portable kits for the direct determination of water quality parameters are employed. These kits are designed to be used by non-scientists and only require the users to be able to follow simple written instructions. Furthermore, because of their compact size these kits can be carried and used directly in the field. Students practice using the kits in the lab by analyzing standard solutions and then perform analysis on fresh water bodies in the vicinity of the college. At the end of the semester, the students get the unique opportunity to perform water analysis on the west coast of Vancouver Island during a one week field trip. This presentation will outline the water chemistry kits that have been used at Langara college, their strengths and limitations, and how the results obtained from some of the kits compare to those obtained using standard laboratory techniques.

POSTERS

Dr. R. Max Ferguson: Dept. of Chemistry, Eastern Conn. State University

"MTBE Tops the Top-10"

The identification of significant environmental problems across North America provides a step toward abatement, remediation, and possibly avoidance of severe consequences. My original (1999) "Top 10" included some comprehensive items which can be elucidated or reduced as time passes. Although chemicals play an important role in most compartments of the environment, the list is general enough to include physical constraints that might alter the impact of chemicals in the real world as well as in the laboratory. The widespread use of methyl tert-butyl ether (MTBE) as a gasoline additive is highlighted as an example of a major problem due to contamination of water supplies and possible impacts on human health. MTBE chemistry is included along with alternatives to MTBE.

Lillian Martin: Dept. of Chemistry, University College of the Fraser Valley,

"Microwater and Other Silly Things"

As Ed Doadt has pointed out in his excellent series 'Chemistry on the Internet' (in Chem 13 News) there is a wealth of good chemical information out there. Unfortunately, there is also a lot of misinformation. Meant to amuse rather than inform, this poster will delight you with such concepts as 'microwater' which is not only 'superhydrating' but also 'charged with electrons making it a neutral anti-oxidant'. There is also 'clear water' which has been treated with an electric field so that it will remove scale build. There is much here that might be used in 'What's wrong with this statement?' type questions. Enjoy!

Dr. Bob Perkins: Dept. of Chemistry, Kwantlen University College, Surrey, BC

"Hands-ON Isomers"

I will briefly describe an open-ended classroom activity that I have used in my first-year chemistry classes to introduce IUPAC Nomenclature and the various types of isomers possible for organic compounds.

David Taylor* and Mark Thomas: Department of Chemistry, Kwantlen University College, Surrey, B.C.; e-mail: davidt@kwantlen.bc.ca

"Problem Solving Organic Chemistry Labs: A: Alkyl Halides - Formation, Substitution And Elimination. B: Hydrogenation And Rearrangement"

A: The students carry out (in pairs) free radical chlorination and bromination of isobutylbenzene and deduce the structures of the products based on hydrogenation and solvolysis experiments. Some of the results are compared with those predicted by energy calculations using Spartan.

B: The students hydrogenate carvone (in pairs) with PtO_2 or 10% Pd/C. The products are analyzed by GC. The crude product obtained with 10% Pd/C is separated into neutral and aq. NaOH soluble fractions and the structures of all products are deduced from their IR and NMR spectra.

Chem Ed in Oz

Dietmar Kennepohl, Athabasca University

Cowardly lions, scarecrows, tin woodsmen, munchkins, and wicked witches - I found almost none of these at the Royal Australian Chemical Institute (RACI) Conference in February. However, I did find some wizards in attendance, namely chemists wearing nametags and clutching black conference satchels. These wizards had some good ideas and some probing questions about teaching chemistry.

The RACI Conference was hosted by Australian National University in Australia's national capital, Canberra, and is the equivalent to our annual CIC (now CSC) Conference in Canada. However, RACIC is only held once every five years. Between these five-year events individual divisions such as Chemical Education, Inorganic Chemistry, and Analytical Chemistry hold their own specialized meetings. I was immediately struck by the almost identical look and feel of the multidivisional RACIC compared to our own CIC meetings. The only difference was that instead of already knowing half the attendees, I knew only a handful of the chemists at the RACI meeting. I spent most of the week hopping between Inorganic, Physical and Chemical Education programs. Members of C_3 might be interested in the themes and presentations of the latter program.

Green Chemistry

The week kicked off with presentations on Green Chemistry. Not surprisingly, this was a joint session with the Environmental Division. Although environmental chemistry has been taught at post-secondary institutions for about a decade now, Green Chemistry is relatively new. Green Chemistry is the design, manufacture, and use of cleaner chemical processes that have little or no pollution potential or environmental risk. The processes so designed and implemented must also be both economically and technologically feasible[1]. Some talks focused on new processes being developed, while others looked at designing Green Chemistry courses for senior chemistry students. Some examples of Green Chemistry technologies covered were:

Supercritical CO_2 in synthesis and fabrication of materials

Oxidation reactions using benign oxidants (e.g. activation of H_2O_2)

Water as solvent using microwaves in synthesis or Grignard-like reactions with indium

Biocatalyses

Non-solvent reactions

Many of these techniques are ideal for teaching purposes and do not necessarily need to be incorporated into an "environmental" course. If you are not already doing something like this, it may be worthwhile to consider some aspects of Green Chemistry in your own course.

Flexible Delivery

This is all the rage in Australia and is associated with providing more direct access to students, using high-end information and communications technology, designing courses to be more student-centred, and saving money. However, in my week at RACI, I found that depending on your particular institution, Flexible Delivery could mean different things. One institution would say that distance education aimed at students in remote locations was an example of Flexible Delivery. However, another institution would say that having the student choose 9 out of a possible 12 course sections would be Flexible Delivery. Flexible Delivery has become an overused buzzword and is, I believe, a direct response to severe financial cutbacks being experienced throughout Australia in advanced education.

Presentations included videoconferencing lectures, use of multimedia (or mixed media) in teaching, split classes of traditional and distance delivery, and the use of Computer Aided Learning tutorials. One of the more memorable presentations came from Roy Tasker, about designing electronic learning resources. Roy's commercial teaching materials can be found on the CD-ROM that accompanies the textbook *Chemistry: Molecules, Matter, and Change* by Atkins and Jones.

The Chemistry Olympiad

This theme was directed mainly at chemists involved at the secondary level, although many of the key figures involved in its eleven-year history come from post-secondary institutions. The Australian Chemistry Olympiad is used not only to establish the Australian team that will go to the International Chemistry Olympiad, but also to challenge school students to participate in a

"real" science at a young age (Grade 11/12). It encourages self-directed learning, problem solving and teamwork. The competitions are based on both a written and a practical examination. A fellow Canadian, Bob Cook from Bishop's University, gave a historical review of the International Chemistry Olympiads and addressed some of the future challenges of the movement.

Not presented at RACI but also worth mentioning here is the work of Charles Fogliani from Charles Sturt University near Sydney. He has established a national chemistry quiz for high school students that has gone a long way in sparking awareness and interest in chemistry among the young, as well as in setting an informal national standard.[2] To give you an indication of this achievement note that no one, including the federal government, has been able to establish any sort of national examination in Australia.

Chemical Education in the New Millennium

This was the generic title for the session that spanned the last two days of the conference and featured the more philosophical papers relating to chemical education. Titles such as "Why do we teach chemistry?", "What is wrong with the way we teach science?", "Making chemistry meaningful" and "Chemistry in daily life" give some suggestion of the flavour of this session. One afternoon also included a workshop entitled "Captivating chemistry," which allowed participants to practice unusual in-class exercises aimed at generating student involvement and interest. Of the many common themes one typically sees when teachers of chemistry come together, there were a few major concerns that were held by all.

How do we engage students to higher degree? In particular, is the way we teach chemistry the best way students learn? Research data seems to indicate: no. There is, therefore, always room for improvement here.

One idea might be teaching fewer topics with more depth; this is pedagogically preferential to giving shallow coverage to many topics. With the time and money pressures placed on instructors by most institutions, this can become a serious bone of contention.

We also need to make more connections between chemistry and the students' own experiences. Chemistry is not an abstract subject; it is part of the real world. Make it relevant. (This idea is also strongly connected to generating a better image of chemistry and chemists.)

Summary

Chemical education in Australia has many of the same goals and challenges that we experience here in Canada. This short review presents only a brief snapshot of some of the items being discussed, emphasized, and practiced in chemical education Down Under.

Entering a new millennium offers us all a time for reflection on the way we present and teach chemistry. It is not surprising that it was used as a theme for the Chemical Education Division at RACIC. I was heartened by the fact that the genuine concerns for teaching chemistry in the new millennium had less to do with new technologies and more to do with sound teaching methods. Perhaps the wizard was right - we already have the hearts, brains, and courage.

Now, how do I get back to Canada...?❄

P.T. Anastas and T.C.Williamson *Green Chemistry: Environmentally Benign Synthesis and Processes*, Oxford Science Publications, 1998.

Australian National Chemistry Quiz information at http://www.raci.org.au/RACI/ChemWeek/ANCQ

RENEWALS

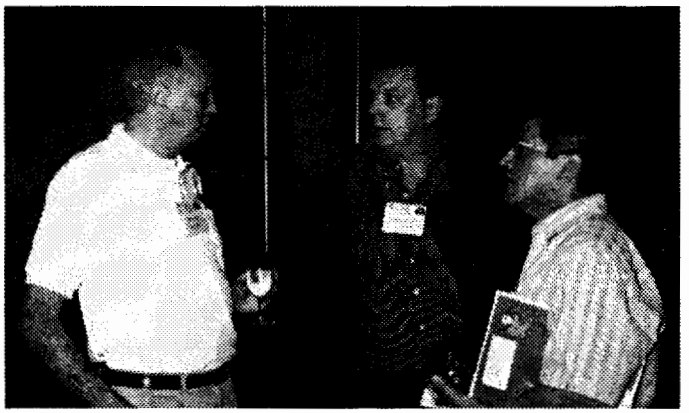
IF YOU WOULD LIKE TO CONTINUE RECEIVING C_3 NEWS, PLEASE REMEMBER TO RENEW YOUR ANNUAL MEMBERSHIP. FORWARD A $20 CHEQUE MADE PAYABLE TO "COLLEGE CHEMISTRY CANADA" TO THE TREASURER, JACKY MCGUIRE.

ONLINE ?

VISIT THE C_3 WEB SITE AT www.c3.douglas.bc.ca FOR MORE INFORMATION AND ARCHIVES.

C_3 Conference 2000 Summary
by Bob Perkins

Another great time was had by all at the annual C_3 conference in Kamloops. One of the great strengths of C_3 is, I believe, the chance to see how our colleagues at other institutions do their thing, and this conference presented another fantastic opportunity to do just that; every year we get a chance to catch up with each other, compare notes and learn some new stuff that we can perhaps use in our classrooms. In addition to the interaction with other instructors, I was very impressed with the quality of the presentations from outside the classroom; we had speakers from a wide range of educational *and* industrial settings. You will find full abstracts for each paper in this issue, and in this article I will try to give a brief summary of each one. Every talk was followed by several questions; discussions continued over coffee at the breaks.



Don Todd, Graham Sparrow and Marco Castillo chating at the Thursday evening mixer / reception.

Kristin Orians (UBC) gave an excellent survey of some of the solutes in seawater. Paleoceanography allows scientists to track what has happened in the past and make predictions for the future. For example, yow many of you realized that the ocean contains 55 times more CO_2 than the atmosphere, or that seeding the ocean surface with iron (at the nanomolar level) will result in enhanced growth rates of phytoplanton?

In his talk, Sudhir Abhyankar (Grenfell College) described several solventless organic experiments that he has been using with his second year students. All the reactions he uses are extremely fast and have simple workups — I may try a couple with my second year students.

Stacey Jyrkkanen (a graduate from UCC) described, with great enthusiasm, her job with Neste Resins. I was very impressed with her description of the plant in Kamloops (27 million kg of urea resins produced in 1999), and amazed at the list of duties associated with her position. It appeared that she was working 36-hour days!

Mark Freeburg then gave an excellent presentation on the topic of site remediation around the Highland Valley Copper Mine (Canada's largest). Leaching of molybdenum from the tailings was a concern as molybdenosis (actually a copper deficiency) affects ruminants and many ranchers graze cattle on some of the reclaimed land.

In an excellent example of the cross-disciplinary nature of science, John McIntosh (UCC) described how to construct a flow-injection system for the analysis of copper/selenium/tungsten. The results obtained were very good.

Chris Jofriet (Niagara College) described the current status of the environmental chemistry program at her institution and the plans for the future (the grape vines are growing!!). A strange fellow by the name of Bob Perkins (KUC) then gave a hands-on activity involving molecular models to illustrate how he introduces IUPAC nomenclature and the relationship between isomeric molecules to students.

Ariel Fenster (Vanier College) gave another excellent presentation, combining science fact/speculation/humour to cover the topic of genetically modified food. Did you know that about 70% of processed food in North America presently contains genetically modified ingredients? He led us through the development of insecticides like nicotine sulphate, DDT, and malathion, and then to the use of incorporating the gene for the natural insecticide bacillus Thuringensis (Bt) into various plants (Bt-corn, Bt-potatoes etc...).

Marni Gillis (another UCC graduate) then described her job with the city works department in Kamloops. She has been associated with the campaign to raise awareness surrounding the problems with Non Point Source Pollution, for example oil droplets from highways and parking lots that eventually get into the environment via storm drains. She is very active with schools and community groups and has been very pleased with the support shown by the local media.

Andrew Mosi (Langara College) described the range of tests that could be performed on water samples in the

field using portable kits. Kelly Sweinson (Langara College) then described the use of the kits by his students at several sites during a field trip to the West Coast of Vancouver Island. Norm Reed (UCC) finished off the program with a discussion of the results obtained by his fourth year students surrounding benzylic lithiation.

I also found the poster presentations to be very good and enjoyed the chance to have a chat (with beer in hand) with the presenters before the banquet on Friday night. At the banquet the C_3 Student Award was presented to Karen Burkell, and we awarded three Chemmies for preformance above and beyond the call of duty at the Loyalist conference. The three so honoured were Pat Draper, Keith Germaine and Margo Wassenaar-Faber.

Karen Burkell, UCC Environmental Chemistry student who won this years C3 Student Scholarship, thanks the conference participants, at the Friday evening banquet.

Saturday morning's C_3 Fun Run gave a few courageous souls a chance for a bit of hill work with the reward being a beautiful view of the city. Saturday afternoon gave delegates a choice of a CHIME workshop or a Demonstration workshop. The demo session finished in a big way when Jim Davies set off a hydrogen/oxygen explosion in a garbage can in the parking lot.

The Saturday session finished with a great tour of the Bear Brewing Company. We were all convinced that the owner could step into the classroom and be a very effective instructor. The Sunday tours were well-attended and we will hopefully get some of the pictures up on the C_3 Web Site to give those of you who were unable to attend a taste of what you missed.

Thank you again UCC and I look forward to seeing many of you next year in Montreal.❄

David Beardsell, Brewmaster and Co-owner of the Bear Brewing Co. (Kamloops) takes us on an excellent tour of the companies beer production facilities

Ariel Fenster, the fourth plenary speaker, raises a glass of good cheer at the Friday evening banquet.

Sharon Brewer (who helped with conference organization), John McIntosh (who presented a paper at the conference), and Norm Reed (the conference program chair), all from UCC Chemistry, at the Friday evening banquet.

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