C_3 News

Fall 1989
Vol. 14, No. 3

Newsletter of College Chemistry Canada / La Chimie Collégiale au Canada

In the *News*

This week's activities of the C_3 Conference Organizing Committee gave new meaning to the old saying that there is no free lunch. In my naivety, I was under the impression that my involvement in the committee's work was to attend meetings, make suggestions, pick up any scraps of information which could be used in the newsletter, and, of course, absorb lunch. So far lunches have been generously provided by B.C.'s Open University. Last thursday, however, the chickens came home to roost, and I left the meeting with a healthy selection of jobs to do, and a deadline to keep me motivated. Not only is Alan Davis in his administrator mode at these meetings, keeping discussions on track and to the point, but he shows an alarming memory. I apparently mentioned some time ago that I would like to organize the annual fun run, and of course I was given the job. We will be reporting on the plans for the conference as they take shape, and we'll publish the complete programme in the March issue.

Congratulations to Bob Perkins for winning the Polysar Award. Hopefully it will encourage him to continue his excellent work in chemical education.

I have included the first of the columns *Reports From the Regions* in this newsletter, although I only had reports from two regions. Those directors who didn't respond to my request for news had better brace themselves; I intend to pester them mercilessly to get something for me for the next deadline (Dec. 8).

I also received a "pome" from someone called "the professor" which I have reprinted without editing. Any ideas who it is?

Bob Browne, Editor

17th Conference, June 14 - 16, 1990

Conference '90 Report

By Penny Le Couteur

The 1990 College Chemistry Canada Conference is back in Vancouver. Those of you who can remember back to 1978 may recall an enjoyable (and educational) conference in June of that year at Capilano College in North Vancouver. Well, this year we hope to have an even bigger and better conference. Conference '90 (June 14-16) is a joint meeting with $2YC_3$, and we hope that many of our U.S. colleagues will join us. Details of the conference programme will be available in later issues of *C_3 News*. Alan Davis is the Conference Programme Coordinator and he assures me that the star studded line-up of speakers he is planning will make the trip west worthwhile in itself.

But who comes to Vancouver just for a conference! We could send out, with the conference registration packet, travel brochures describing the tourist glories of British Columbia (and we still might), but the local conference committee consisting of Bob Browne from Douglas College, Alan Davis from B.C.'s Open University, and Alan Gilchrist and myself from Capilano College decided to see what response w would get to arranging small, informal an inexpensive activities for the Saturday after noon and Sunday after the conference ends Often you can get a much cheaper airline far if you stay over a Saturday night, but many of us do not enjoy staying over by ourselve in a strange city for a weekend.

The following is a list of activities sug gested by the committee:

1. Hiking on the North Shore mountains: A two or three hour (round trip) walk fron the top of the Grouse Mountain gondola t Goat Mountain - alpine scenery and wonderful views of the city and harbour.
2. For the more adventurous, an all day hike on Sunday in the Garibaldi Park area.
3. Museums: the Maritime Museum, Vancouver Museum and Planetarium, and Science World (on the old Expo site).
4. Bike riding: Rent a bike and take a tour o Stanley Park or follow the bike routes around Vancouver for a longer trip.

Please see CONFERENCE, page 2

In this issue...

CONFERENCE *continued from page 1*

5. Interested in horticulture? We could arrange a tour of some of Vancouver's famous gardens - Queen Elizabeth Park, Stanley Park, VanDusen Gardens or the Sun Yat-Sen Classical Chinese Garden.
6. How about a behind-the-scenes tour of the Vancouver Aquarium?
7. Interested in art? There is the Vancouver Art Gallery and many smaller galleries and studios which feature the work of local artists.
8. Have you always wanted to go salmon fishing but aren't sure how to go about it? You can rent small boats and fishing equipment at Horseshoe Bay, and if two or three people are keen to do this, we will help arrange it.
9. Food! Group bookings at a variety of Vancouver restaurants for the Saturday evening and you can choose between Chinese, Japanese, Thai, Greek and seafood.

"What we want are your ideas and suggestions"

These are just some ideas. You might be really interested in antique auctions and would like to go to one during your Vancouver stay but you only have the Saturday afternoon and how do you go about it? Maybe there are other conference attendees who are also antique buffs and we can organize an auction visit for you. For many of the activities, a local C3 member would be part of the group, or where appropriate we will arrange for a local expert (hiker, botanist, anthropologist, etc) to lead the group.

What we want are ideas and suggestions. Please send your comments on the above list, or suggestions for other activities to:

Penny Le Couteur
C3 Conference Coordinator
Capilano College
2055 Purcell Way
North Vancouver, B.C.
V7J 3H5

Remember that these will be informal arrangements. There may be ten, or only two people interested in a particular activity. Conference registration forms will include a space for you to indicate your interest in these outings, but generally you won't have to reserve a space or pay money. If you are interested in more elaborate activities (white-water rafting, glacier skiing, whale-watching, etc) we can send you the information and you can make your own arrangements.

Don't forget the traditional C3 Fun Run which we are planning for Saturday morning. Vancouver is the jogging capital of Canada, and we promise you the most scenic 5 km in the country✎❐

Perkins Wins Polysar Award

The winner of the 1990 Polysar Award for Chemistry Teaching in Community and Technical Colleges is Bob Perkins. The award consists of a commemorative scroll and an honorarium of $500, and will be presented at the annual Canadian Chemical Conference held in Halifax in July of 1990.

Bob Perkins is no stranger to members of C3 or to readers of this newsletter. He served as editor from 1984 to 1988 and continues to be a regular contributor with his "Teaching Tips" and "Hot from the Presses" columns. His literary efforts, however, extend well beyond the pages of the *C3 News*. In the past ten years he has published twenty-nine articles with titles as diverse as "Pressure and the Exploding Beverage Container" and "Colourful Solutions Made Easy", all dedicated to improving the communication of the concepts of chemistry to students. He has also co-authored a chemistry text called "Chemistry - A First Course" and has written a very clear description of beginning organic chemistry in his text "Organic Chemistry - A First Course".

In addition to his B.Sc (Bishop's) and Ph.D (UBC) degrees, Bob is also the holder of a B.C. Teaching Certificate and has taken an interest in the teaching of chemistry in the schools. He has taught upgrading courses for high school chemistry teachers, and participated in professional development sessions aimed at helping teachers with classroom demonstrations. In addition, for the past two years he has served on the B.C. Chemistry Olympiad Committee.

Bob is currently a contract instructor at Kwantlen College in Richmond and spends his summers teaching organic chemistry at the University of B.C. He lives with his family in Delta B.C. and hopes eventually to get a permanent teaching position in the Vancouver area. His selection as this year's Polysar Award winner will hopefully bring this closer to becoming a reality✎❐

C3 News
Volume 14, No.3, Fall 1989
Published quarterly by
College Chemistry Canada Inc.
President: Alan Davis
Editor: Bob Browne
Contributing Writers:
Bob Perkins
Penny Le Couteur
Mailing Address:
Douglas College
P.O. Box 2503
New Westminster, BC
V3L 5B2
Tel: 604-527-5228
Fax: 604-521-7250
Articles of any length will be gladly accepted. Please send typewritten copy to the Editor at the above address or send by fax. Copy can also be sent on a 5 1/4" floppy disk, IBM format, using WordPerfect, WordStar, Microsoft Word or any wordprocessor producing ASCII output. Deadline for the next issue is December 8, 1989.

ISSN 0843-4956

Reports From The Regions

Atlantic Provinces

Sudhir Abhyankar, C3 Director

Dr. Julian Dust and **Dr. Robert Haines** joined the chemistry department at Sir Wilfred Grenfell College. Julian comes from the University of Alabama, Huntsville, and Robert from Atomic Energy, Chalk River.

Geoff Rayner-Canham returned from a successful sabbatical year in California and Florida (successful in what, is anybody's guess).

Sudhir Abhyankar presented a paper "Undergraduate semi-micro organic labs-Taking the middle path" at the CIC conference in Victoria in June.

Geoff Rayner-Canham attended the workshop on micro labs in general chemistry at the Chem Ed conference at Queen's University in August '89. He also presented the paper "Chemical Principle versus STS: Where is the Balance?" at that conference.

Patrick Monaghan is the co-organizer of the conference on "Time and Space" to be held at Grenfell College in May 1990.

Prairie Region

Cynthia Mutch, C3 Driector

Former C3 director, **Errol Carruthers**, has retired after teaching chemistry at Medicine Hat College for the past 24 years.

Errol was born in Prince Edward Island, did a B.Sc.(honours) in chemistry at Mount Allison University and then an M.Sc. at McGill where he worked alongside Natasha Hollbach (former C3 secretary) in Dr. Yaffe's radiochemistry lab.

After graduating he worked for Atomic Energy of Canada at Chalk River for three years and taught high school chemistry for six years in Ontario.

In 1965 he came to Alberta to develop the Chemistry Program for the newly founded college in Medicine Hat. He has been the quiet and industrious mentor for the department ever since.

Errol has found his greatest satisfaction in teaching chemistry has been the association with the students, introducing them to a branch of science he enjoys. His biggest disappointment is that he has been unable to persuade more students to follow a career in chemistry.

Errol attended his first C3 conference in Regina and has been attending ever since. He has served as a regional director of C3 from 1982 to 1986. He hopes to be able to continue to attend C3 conferences and maintain contacts with his friends and associates in the organization.

Errol, we wish you well. Yours colleagues and students will certainly miss you!

We wish to welcome **Brian Lloyd** who has been appointed as an instructor at Medicine Hat College.

Brian did his B.Sc. and Ph.D. at the University of Western Ontario and has experience as a post-doctoral fellow in the U.K., U.S.A, and Canada.

He is looking forward to the new challenge of teaching chemistry and has already become a member of C3.

Brian, good luck in your new endeavours.

* * *

Do you have any news about your college or region? Please send items to your regional director, or to the editor. Names and addresses of regional directors were listed in the last issue of C3 News.

President's Notebook

This time of the year is always an exciting but also frustrating one for education. New courses, new faculty, freshly-scrubbed students and (in B.C. at least) lovely late summer weather. On the other hand, classes are bursting, students who were turned away are licking their wounds, some of our colleagues (as I write) are on strike, and as usual, there is nowhere to park.

As an educational administrator (which I've now become), I am aware of a moment when all the planning, budgeting, timetabling and hiring culminate in a special moment: the right instructor is in front of (or otherwise in contact with) the right students carrying the right texts, in the right place at the right time. It's akin to watching the launch of a boat you spent all summer building. Will it float? (or will it float if I just plug a few holes?)

It is most reassuring that the ultimate success of the whole enterprise is largely dependent on the skill and experience of the ship's captain, the college instructor, who will guide the passage of the students through some difficult waters, and help a large portion of them to reach their goals. And as I let these people sail off into the sunset, I must now start worrying about the next session.

Alan Davis
President, C3

Computer-Based Studies for Physical Chemistry

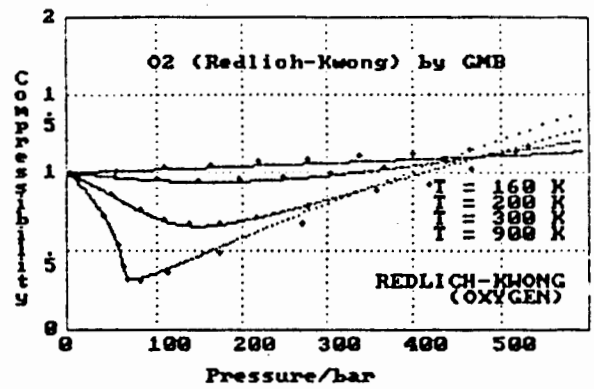
Gordon Barrow is a well-known author of chemistry texts. In addition to his "Physical Chemistry" which is in its fifth edition, he has written a general chemistry text and a physical chemistry text for the life sciences. Perhaps less well known are his computer-based support materials for the physical and general chemistry courses. Although he grew up in Vancouver and attended the University of B.C., most of his career has been spent south of the border. Seven years ago he returned to his home province and took a teaching post at the Royal Roads Military College in Victoria where he has been teaching and developing instructional materials ever since.

Capilano College recently invited Barrow to give a workshop to demonstrate the use of his computer-based studies in physical chemistry, a series of programmes which he authored some ten years ago.

The programmes cover a wide variety of topics: gases, thermodynamics, quantum mechanics and spectroscopy, kinetics, acid-base equilibria, diffusion and the ultracentrifuge. There are over 100 programs in all, each one accompanied by a student study guide, and each one designed to allow students to observe the results of varying parameters in a variety of standard physical chemistry equations.

Typical of these programmes is one which calculates the compressibility factor from a number of two-parameter equations of state for a real gas. The student is given a brief on-screen introduction to the subject, including the form of four such equations (van der Waals, Dieterici, Berthelot, Redlich-Kwong) and asked which of eleven gases are to be used. The program then allows a student to choose the pressure range and temperature, and then plots the compressibility factor using the equation chosen. The results are compared with the "experimental" values, which in this case are worked out using the five-parameter Beattie-Bridgeman equation, which gives a reasonable approximation up to about 250 atm. The student can then change axes or overlay with a number of different temperatures until the desired plot is obtained. The study guide then requires the student to get a printout and answer questions and exercises based on the graph.

The idea behind these programs is wonderful. How many times have you wanted to produce instantly the titration curve for a weak acid, and show how this changes with the value of the acid dissociation constant? Or plot a vapour pressure-composition diagram for both ideal and non-ideal systems? These would be extremely useful for showing a class in a lecture (if you have a LCD overhead and a computer in the classroom). The fact that students are required to produce printouts and answer questions based on them means that they will do more than just play. My only criticism is that these programs were written in basic for the Apple, about ten years ago. They were transferred to the IBM four years ago with the addition of colour, but have not been updated since. Both the screen output and the printouts, however, still look like the old Apple output. They would certainly benefit from a conversion to EGA or VGA to enhance the on-screen resolution. Further information about the programs can be obtained from The Milne Press, P.O. Box 1246, Carmel Valley, CA, 93929, USA. ❐



The compressibility factor for O_2 calculated from the Redlich-Kwong equation at a number of temperatures.

Certification for Chemical Technologists

Are you a certified chemical technologist? The Canadian Society for Chemical Technology will give certification, and allow you the privilege of using the initials "cCT" if certain conditions are met: you must have graduated as a technologist from a program approved by the Society, and have a minimum of two years experience in the profession. If you meet these requirements, all you have to do is apply to the CSCT.

The Canadian Society for Chemical Technology is a constituent society of the Chemical Institute of Canada and is the designated arm of the Institute in all matters pertaining to chemical technologists nationally and internationally. The idea to form such an organization came at the 54th Canadian Chemical Conference in Halifax in 1971. Since that time the Society has been concerned with the advancement of its members and their role in the workplace.

Any member of the CSCT is also a member of the Chemical Institute of Canada, and in addition to the benefits provided by the parent organization, offers its members special services such as annual salary surveys, employment insurance, group life insurance, group automobile and household insurance, and a group disability and income protection plan.

If you want more information about the organization or certification, you can contact the CSCT at the following address:

Executive Secretary CSCT
Suite 550, 130 Slater St.
Ottawa, ON
K1P 6E2

Canadian Students Win Silver and Bronze at International Chemistry Olympiad

The Canadian team acquitted itself well at the XXI International Chemistry Olympiad, held in Halle, GDR from July 2 to 9, 1989.

Marilena Fitzsimons from Quebec and Christopher Chan from Ontario won silver and bronze medals respectively.

The process of selecting students to represent Canada started last October. At that time schools were informed of the programme and students were invited to participate. In British Columbia, this participation involved students working out solutions to a series of five problem sets, which were graded and returned. Based on the results, the top twenty five students in the province were invited to attend a training session and write an examination set by the national committee in Toronto. This committee selected the top 12 students in the country who were then invited to attend a national study camp at the University of B.C at the end of May. Finally, after an intensive schedule of tests, labs, lectures and workshops, the 1989 team, consisting of four students was selected.

On July 2, 104 student competitors from 26 nations converged on the city of Halle, (approximately 225 km south east of Berlin) for the final showdown. On July 4, the students wrote a five hour long theoretical paper which consisted of six questions dealing with various fields of chemistry. The following day, each student was evaluated on two laboratory exercises. Then, while the international jury wrestled with the results, the students toured various cities and attended social events which were planned for them. When the results were published, the Canadian team had been awarded two medals. In addition to her silver medal, Marilena received the special prize for the highest-ranking competitor of sex opposite to the overall winner.

Students who participated in this year's Chemistry Olympics were uniformly enthusiastic about the experience. Not only does the programme encourage students to learn topics well beyond the scope of Chemistry 12, but gives them an opportunity to travel and meet students from all parts of the world. The XXII International Chemistry Olympiad will be held next July in Paris, France. ❐

17th C_3 - 109th 2YC$_3$ Joint Conference

June 14 - 16 , Capilano College

Call For Papers

Submissions for the presentation of papers to this conference are now being accepted for consideration. Sessions scheduled so far are:

- ❐ *Chemistry and Open Learning (Distance Education)*
- ❐ *Biological Chemistry and Biotechnology*
- ❐ *General Chemistry (Teaching and Curriculum)*

Other topics will also be considered for inclusion in the program.
Please send an abstract for a 20 minute presentation by February 28, 1990 to:

Dr. William Wasserman
Seattle Central Community College
Seattle, WA 98122
Tel: (206) 587-4083 or 587-5438

OR

Dr. Alan Davis
Open University
7571 Alderbridge Way
Richmond, B.C.
V6X 1Z9
Tel: (604) 660-5256

Hot From The Presses!

By Bob Perkins

The synthesis of enantiomerically pure compounds remains an important area of organic research. The stereoselective reduction of ketones utilizing baker's yeast has recently been described by D. Kertesz and A. Kluge. J. Org. Chem. **53**, 4962-4968 (1988).

Aryl carboxylic acids can now be easily prepared from aryl iodides in the presence of carbon monoxide (1 atm) using a phase-transfer catalyst. I. Amer and H. Alper, J. Org. Chem. **53**, 5147-5148 (1988).

The bizarre behaviour of Van Gogh in his later years may have been a result of an addiction to terpenes. K. Reese, Chem. and Eng. News **67** (3), 84 (1989).

K Suslick and S. Doktyck describe ways to achieve reactivity with Zn powder through treatment with ultra-sonic waves before adding any reagents. J. Amer. Chem. Soc. **111**, 2342-2344 (1989).

The Grignard reaction continues to be actively studied. M. Orchin presents an excellent review of the reaction, (J. Chem. Educ. **66**, 586-588 (1989)), while two other papers describe recent findings concerning the free radical nature of the reaction. E.C. Ashby and J. Oswald, J. Org. Chem. **53**, 6068-6076 (1989); H. Walborsky and J. Rachon, J. Amer. Chem. Soc. **111**, 1896-1897 (1989).

Is the increasing size of introductory chemistry texts becoming a problem? Several letters to the editor in Chem & Eng News consider this question: Sept. 12, p2 (1988); Nov. 7, p3 (1988); Dec. 12, p2 (1988).

Ever since its formation back in 1964, cubane has attracted considerable attention because of its perfect box-shaped structure. Recent work has rekindled interest in the molecule and its derivatives as high energy fuels and possible pharmaceutical products. P.E. Eaton et al have reported on the preparation of the highly strained cubene, the synthesis of phenyl cubanes, and the intermediacy of the cubyl carbocation: Chem & Eng News, Nov 14, 45-52 (1988); J. Amer. Chem. Soc. **110**, 7230-7232 (1988); J. Org. Chem. **54**, 722-723 (1989).

G. Willey describes three models for describing the bonding present in the trigonal planar nitrate ion (Education in Chemistry p78-82 (May 1989)), while J. Pardo presents a model which has been used to teach students how to write Lewis structures for simple species: J. Chem. Educ. **66**, 456-458 (1989).

An excellent account describing the three forms of molecular oxygen ($^3\Sigma$, ground state triplet, $^1\Delta$, excited state singlet, and $^1\Sigma$, excited state singlet) is presented by M. Laing., J. Chem. Educ. **66**, 453-455 (1989).

The use of synthetic zeolites as catalysts has lead to increased yields of gasoline. G. Kerr reviews the recent advances in this area. Scientific American, p100-105, July 1989. ❐

"Greg, since you started working at the lab, you've become so distant and unapproachable."

Rules For Being Human

1. **You will receive a body.** You may like it or hate it, but it will be yours for the entire period this time around.
2. **You will learn lessons.** You are enrolled in a full-time informal school called life. Each day in this school you will have the opportunity to learn lessons. You may like the lessons or think them irrelevant and stupid.
3. **There are no mistakes, only lessons.** Growth is a process of trial and error, and experimentation. The failed experiments are as much a part of the process as the experiment that ultimately "works".
4. **A lesson is repeated until learned.** A lesson will be presented to you in various forms until you have learned it. When you have learned it, you can go on to the next lesson.
5. **Learning lessons does not end.** There is no part of life that does not contain its lessons. If you are alive, there are lessons to be learned.
6. **"There" is no better than "here".** When your "there" has become a "here" you will simply obtain another "there" that will again look better than "here".
7. **Others are merely mirrors of you.** You cannot love or hate something about another person unless it reflects to you something you love or hate about yourself.
8. **What you make your life is up to you.** You have all the tools and resources you need. What you do with them is up to you. The choice is yours.
9. **Your answers lie inside you.** The answers to life's questions lie inside you. All you need to do is look, listen, and trust.
10. **You will forget all this.**

-Anonymous

P is for Potassium

Ah, the gentle groans of high school minds who needs must now know all the names of *all those ions? - without the data listed on my Alchem chart? Assume we'd memorized the common ones before? (We con't do that - our teacher taught us it's against all our beliefs!)* Come on now, folks (you say), you need to have them at your fingertips - how can we work without vocabulary? You offer them "inncentive. How about a little quiz? On Monday morning, say, at nine." *Aghast!* But that would give you all weekend! (Thinks here: Oh, Joy! I s'pose that means they'll skip their calculus at 8. That was the favourite trick last year.)...I know, O reader, you have heard it all before.

It must be fall. There is a definite nip upon the wind, and in the downtown lanes the forest green is smelling musty damp. You can walk home midnights past the schools and watch the mist rise off the playing field or skylights dancing up above the hills (lumière sans son), and when the fog lifts in the morning you expect to see grey where green was before and white will be tomorrow. There's a real magic in the north when it's dark enough to see the lights and stars again.

And in the squat brown building with the purple palace looming over it, the halls are jammed with bodies once again, whose minds seem to have been firmly locked up by years of draining. Not all of them, mind - and maybe it's improving: I didn't get through the first organic lecture's notes, for fielding interest questions out beyond the course's scope; a student came to check her lab prep yesterday - the lab's not 'til tomorrow; people are shouting answers out, who know their stuff; and when I took the CO_2 extinguisher to class, let off a blast, and asked them (with "why does the cylinder get cold when I do that?") what the white cloud actually was, one smart lad told me, and said why that's what it had to be.

And he was one that didn't know his oxidation states! Look at the quiz, and learn some truths you never heard before in chemistry (at least, since last year's quiz). The oxidation state of Lead IV is five (or is that state of bromide 0.8?). The valence of ammonium (NH) is 8, unless the carbonate is -1. And something isn't right, my dears - *he* said HN was nitric acid, and it can't be both. Oh, most people know the symbols, and crammed in most of the ions, but the half that couldn't make the grade just didn't have a clue about those valences. Is my imagination strange, or is this effect a legacy of that dread Alchem periodic table well adorned with every ion and most other notes you'd ever need to take to an exam, the page they use to save the student cluttering up his mind with trivialities.

I called potassium K in question one (she must've thought), so this P must be "Pottass... Phosphour... Phosphorous" Hooray, I got it!

The Professor

College Chemistry Canada / La Chimie Collégiale au Canada

Application for Membership

*Name:*_____

College Affiliation: _____

Position: _____

Address: _____

*City*_____ *Province*_____ *Postal Code* _____

*Renewal*_____ *New Member*_____

Individual Membership: $20.00 per year, payable annually in March
Membership Fee for Institutions: $50.00

Method of Payment: Cheque_____ Money Order_____

Please return this form, with payment, to:

Dinesh Bhatnagar
Algonquin College
200 Lees Avenue
Ottawa, ON, K1S OC5

C3 News
Bob Browne, Editor
P.O. Box 2503
New Westminster, B.C.
V3L 5B2