

C₃ News



Newsletter of College Chemistry Canada / La Chimie Collégiale au Canada

Newfoundland rocks

The joint C₃ - 2YC₃ conference in Corner Brook was a resounding success thanks to organizers Sudhir Abhyankar and Geoff Rayner-Canham. Conference photos and coverage inside.



photos by R. Franchuk



Boat tour of Trout River Pond in Gros Morne National Park (above). A few local tunes at the conference banquet (left).

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C₃ News

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President's message

Welcome back everyone, by now we are all in the midst of a new semester and new academic year, may your classes be full of bright minds! The conference in Newfoundland was (as usual) a great success, we received many very positive comments from our 2YC₃ colleagues on how well we Canadians host a conference. So congratulations to Sudhir, Geoff, and all their assistants for a job well done. Some changes to the executive occurred at the conference: I would like to welcome Diana Messervy to the position of secretary (you now have to remember to send those renewal cheques to Diana rather than Bob), and Bob Perkins to the position of President-Elect. The future of our executive is in very good hands. Be sure to check out the back page to see who your current regional director is, we also had a few changes there.



I have two priorities for this coming year. The first and most urgent is to find a host college for the 1999 conference. As of writing this I have yet to hear from Seneca College, who had tentatively volunteered a couple years ago. If anyone is interested please let us know ASAP. If we do not find an Eastern volunteer, we have a couple of options; host the conference in Western Canada two years running, or join up with 2YC₃ and attend one of their conferences (hmmmmm remember Rhode Island?).

Any input on this matter would be greatly appreciated by the executive, contact any of us. My second priority is to continue to encourage our members to nominate their colleagues for the C₃ Award. This year it was awarded to Bob Perkins. To encourage more nominations, the deadline for nominations has been moved. The complete criteria for the award are available on our web site (<http://www.douglas.bc.ca/chem/c3>). Here they are in brief:

The award shall be offered to a person who has made substantial contribution to chemical education, and has been a member in good standing of C₃ for the past five consecutive years. The award consists of a scroll and a cash prize of \$600, to assist the award winner to attend the conference where the award is presented. Nominations must be received, in writing, by the Secretary of C₃ by *February 1, 1998*. Each nomination must be accompanied by three letters of recommendation from peers of the nominee. Nominations will be retained for consideration for three years.

And, we are in the process of establishing a second student scholarship that would be open to students from institutions other than the host college. Keep watching for more information on this.

In closing, hope everyone had a great summer, good luck with the coming year, and plan on attending the 1998 conference in Medicine Hat, Alberta.

Suzanne (Gardner) Pearce

More details of the 1997 C₃ conference, including abstracts, reviews, and event photos, can be found on the C₃ Homepage. Check it out!

<http://www.douglas.bc.ca/chem/c3/c3home.html>

A Life in Chemical Education

Reg Friesen, University of Waterloo

Bala Naidoo, John Abbott College

Reg Friesen's involvement with teaching chemistry started when he earned his first paycheck at the age of 17; it has continued for the last 35 years as a professor of chemistry at the University of Waterloo till his recent retirement. As a result of his urgings and initiatives, the University has been at the forefront of teacher development in the sciences for Ontario teachers by providing refresher courses and long-distance learning.

The potential science students were not overlooked either; day visits with up to 2,5000 students from about 80 high schools were encouraged. Competitive exams for high achievers were instituted and gave birth in 1971 to the popular Chem 13 exams. As a result of these

measures, a closer relationship now exists between high schools, colleges and the University of Waterloo.

Reg also gave a personal assessment of other changes that he has seen over the years. For example, resources available for teachers are much more numerous now; he, of course, played a role in this since he was the founding editor of Chem 13 News. Although it was initially intended for a limited readership in Ontario, it now prints 5,000 copies which are distributed in 50 countries.

Reg encourages teachers to attend the ever-increasing number of educational conferences where they can exchange ideas with their peers and also get different perspectives on teaching.

The students' experience has also become richer; he finds that more attention is now focussed on the learner and on effective ways of learning. Needless to say, computers and the Web are transforming learning as well.

Although the changes that have occurred are mainly positive, there are still issues that he feels should be addressed, such as the current unpopularity of chemistry among science students and the perceived curriculum overload. He concluded by emphasizing that being an optimist, he has faith in the future and in our ability to resolve the difficulties that are presently affecting chemistry education.

Wine and Cheese Reception

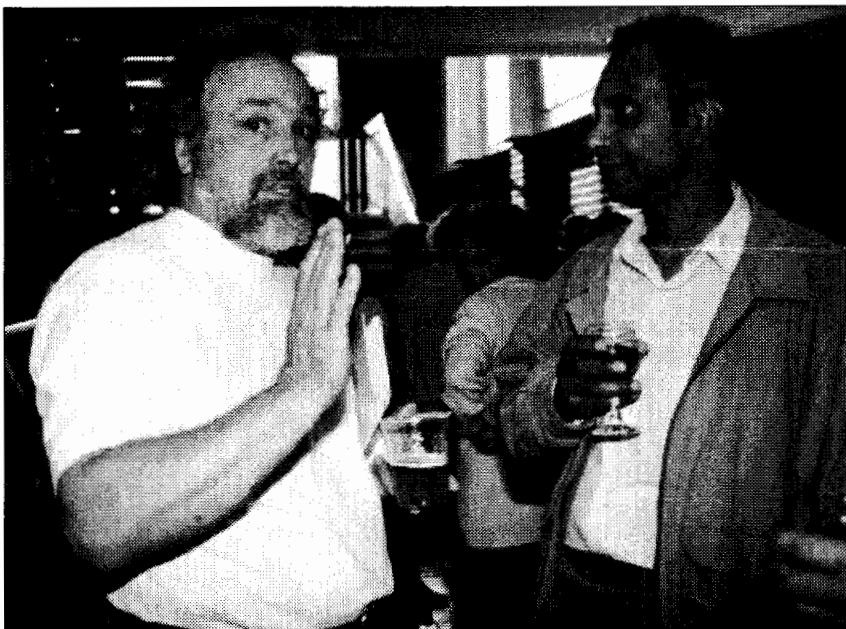
Rod Restivo, Heritage College

From the first sight of the rugged beauty of Marble Mountain to a warm welcome by members of Sir Wilfred Grenfell College's chemistry department, the down-home charm of Corner Brook was felt the instant that C₃-2YC₃ members arrived in town. Former University of Waterloo graduates, Julian Dust (B.Sc. Hons, 1978) and Rod Restivo (PhD., 1969) renewed acquaintances with U of W's pioneer in chemical education, Reg Friesen. Julian Dust gave us a tour of the new environmental chemistry facilities and led us to the wine and cheese reception in the new Fine Arts Building with its panoramic views of the surrounding countryside. Warm welcomes and a good exchange of ideas occurred as delegates made new acquaintances and renewed old ones in this joint C₃ (Canadian) - 2YC₃ (American) conference.

The Quebec contingent exchanged thought on the new competency based 'Alberno College' reform to CEGEP education, and Gary Wilson's grizzly bear story from last year's Chilkoot Pass trip in

the Yukon was verified in his absence. Suzanne Gardner announced that she was getting married, and Bill Blann, sporting a

Following Cabot T-shirt, was overheard saying "Cabot is a red herring since there are no cod."



Rod Restivo and Bala Naidoo in discussion at the wine and cheese reception.

A Chemical Overview of the Smelting and Refining of Nickel

Les Hewlett, Newfoundland Knowledge, Inc.

John Otto Olson, Augustana University College

Voisey's Bay has been the focus of much excitement, activity, and concern since diamond prospectors Albert Chislett and Chris Verbiski discovered a huge nickel-rich deposit there in 1993. The process of recovering the nickel is fascinating because so many disciplines are involved. Mining (both open pit and underground) and beneficiation (by means of flotation) will take place in northern Labrador, while the final stages of purification (by means of pyro- and hydrometallurgy) will occur in Argentina, on the eastern shore of Placentia Bay.

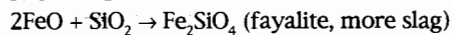
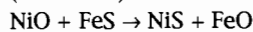
Froth flotation conducted on the finely ground ore can effect not only the removal of much of the waste rock (gangue) but also the separation of some of the copper compounds. Soaps are used in the flotation process, as well as a compound that selectively makes nickel sulphide (as opposed to other sulphides) hydrophobic. Initially the ore contains a little under three percent nickel; the material to be shipped to Argentina should contain about 13 percent nickel, plus two to three percent copper and cobalt. The copper-rich (ca. 10 percent) product of the flotation process will be refined, too (but somewhere else, and by someone else).

Smelting gets rid of iron sulphides (as slag, which is to be "stored" in an environmentally friendly manner, and sulphur dioxide, which can be profitably converted to sulphuric acid) and concomitantly enriches the nickel content to about 65 percent. There are three stages in the smelting:

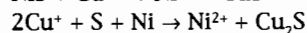
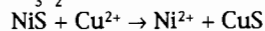
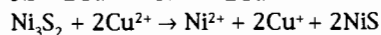
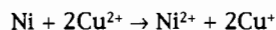
(1) the thermally self-sustaining (1300°C) flash furnace, to which oxygen is added and from which the molten NiS and floating slag (e.g., FeO:SiO₂) are tapped off separately;
 $(\text{Fe,Ni})_9\text{S}_8 + 11\text{O}_2 + 8\text{SiO}_2 \rightarrow \text{NiS} + 8\text{FeO:SiO}_2 + 7\text{SO}_2 + \text{heat}$

(2) the converter (ca. 15 m x 4 m diameter), to which oxygen is also added and from which more slag is skimmed off; and

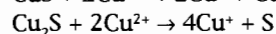
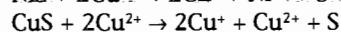
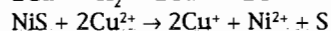
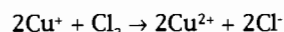
(3) the slag-cleaning furnace, to which iron sulphide is added to retrieve (from the slag) environmentally unfriendly (oxides of) nickel and cobalt.



The matte chlorine leach electrowinning (MCLE) process comprises the final steps in the recovery and purification of nickel. (Matte refers to a crude mixture of sulphides.) First, a cementation (precipitation) stage involves treatment of the finely ground matte with copper ions under controlled conditions to solubilize the nickel. (Sulphur is added to scavenge copper ions, bringing their concentration down to 0.01 g/L.)



In the chlorine leach phase, copper(II) oxidizes sulphide to free sulphur, liberating (solubilizing) virtually all of the remaining nickel(II) (as well as copper(I) and (II)); again, conditions are carefully controlled.



Finally, electrowinning of the nickel is carried out in a special electrolytic cell under controlled conditions. The MCLE process also provides for sulphur recovery, chlorine recycling, and electrowinning of copper and cobalt.

C₃ Fun Run

Patrick Draper, Champlain Regional College

Nine enthusiastic individuals braved the early start and gray skies to participate in the Corner Brook edition of the annual C₃ fun run. The course followed a loop from the College through the downtown area and back up the hill. Several runners shared the lead for most of the race, but in the long climb to the finish Bob Browne pulled ahead and claimed the coveted J. Willard Gibbs Memorial Trophy. Run or walk, the fun run is a great way to get a workout during the conference and to meet colleagues in a different setting. Include this in your agenda for next year's conference.



President Suzanne Gardner during the presentation of the Chemmy Awards at the C₃ Banquet.



The Townsite Ceilidh Band plays a few island favourites

Phases of Matter Revisited

Mary Anne White, Dalhousie University

Dawne Smith, College of the North Atlantic

This talk made chemistry relevant to everyday life. Multiple areas for demonstration were given.

- NaCl crystals can be broken along cleavage point, like cutting diamond.
- Diamond vs. graphite characteristics plus C-60 ("Bucky-ball") comparisons. Can make "new" molecules by placing atoms inside the C-60 molecules.
- Heat conduction by Al -painted black - used to defrost meats (not anything "magical"). Emphasized new materials, with metallic properties, used in microchips.
- Snowflake crystals actually have 6 points - unlike that of the paper-folded games.
- Magnetism from ionic compounds- not only from elements like Fe
- Ceramics - Heat treating changes their properties. Used in sodium lamps.
- Alloys will bend and recover quickly e.g. Ti-Ni alloy springs back into shape in warm water vs. cold: Martensite/Austenite states
- Liquids- drinking bird experiment very useful for vapour pressure lesson.
- Amorphous materials - can make a whole chemistry course on how the photocopier works, including toners
- Bouncing balls- one bounces, other does not because of differences in crystal properties
- Liquid crystal chemistry - see a cloudiness from organization of specific atoms

Useful recommended texts: Cambridge Guide to the Material World (Cotterill); Teaching General Chemistry for Material Science by Ellis (ACS).

Banquet

Diana Messervy, West Viking College

On Friday, June 13 a festive evening was enjoyed at the Blomidon Country Club in Corner Brook. In a rustic log cabin setting, the highlight of the evening was local lobster - two per person (and more for some)

The evening was introduced with a slide presentation on Western Newfoundland by geographer Keith Nichol. Keith described geological phenomena which made Gros Morne a World Heritage site - a collision of continents some half-billion years ago which deposited material from the earth's mantle on the surface of Gros Morne. Inland fiords, caribou herds, moose and humans on hiking trails were pictured. Keith continued his tour up the Northern Peninsula, past Lanse'aux Meadows, another World Heritage Site, reputed to be the first documented site of Europeans arriving in North America, and then to the Grenfell Mission Hospital. The latter was named after Sir William Grenfell, as was the host college for the 1997 C₃ conference. The presentations concluded with an inspiring list of the many adventure tourism activities available in the area - from whale watching and ocean kayaking to fishing, skiing, and ice climbing.

The buffet lobster dinner began immediately thereafter. During dessert and coffee, the president, Suzanne Gardener, presented the 1997 C₃ awards.

The award for the top C₃ new story went to Dawne Smith of Cabot College, NF; Bob Perkins of Kwantlen College, BC won the C₃ award for excellence in teaching, and the "Chemmys" for antics at the 1996 conference went to Carol Lounsbury from Red Deer College, AB (she created an international incident). Keith Ellis of Douglas College won a set of flotation arm bands in recognition of his prowess as a raftman as demonstrated at the Yukon conference.

The evening concluded with "jigs and reels" music by the Townsite Ceilidh Band, a musical group from Grenfell College.

Approach to the Rock

Bill Blann, Keyano College

If you flew in to Deer Lake you may have been lucky enough to get a quick birds-eye view, after a couple of hours in the tin tube and maybe the glories of the Red-eye (been there, had to do that as far as Toronto mesel'); in fact, maybe you weren't even able to get to the Rock at all. For you, here's a taste of what the overlanders saw.

Sunny morning - 7 o'clock. Cabot Strait like a mill pond. Bright sun; salt air; gentle breeze from the speed of the ship! Lovely - finest way to wake up in the morning! There is only one way to approach the rock: from the sea.

Land Ho! and the white blobs on the shore resolve themselves into the typical Newf'n'land scatter of houses strewn about the rocks - the cliffs and hills beyond the shore are bathed in shadows and draped with snow patches - the sno... Be the Lard L'vin' Jaysus, b'y, doesn't they know 'tis June already, here on the Rock?

But 'tis a terrible fine ship, the Caribou - second by that name - big blue and white boat with the yellow stripe and CABOT fair scrawled on either side. The bus from Nova Scotia just leaves time for a bite in the terminal, and the fish and chips has real fish, albeit these days probably imported from some Portuguese trawler. (Newf'n'landers knows there is only one kind of fish in the sea, or used to be. Why, down the village I once heard a skipper just back to the stage grumbling in his beard as he climbed out of the dory: "Tons of herrings out there b'y, but never a fish to be seen all day!") and so on board - a \$12 sleeper ticket gets a bunk with a pillow and blanket - there's a cosy lounge but beware the Keith's draught: nothing to write home about (the polite way of saying it's *aqua felis*) even after a fine long day on the road - and the breakfast in the morning is as fair and efficient as they comes. A fine crossing we had of it - the slightest roll from time to time, no squalls, no rain, no U-boats this time. (Not like the first Caribou in 1942 - probably the only ferry boat to be sunk by a torpedo.) And so the sparkling morning into Port-aux-Basques.

Soon after landing there's a fine new bus from a fine new bus line for the sunny day's tour up the TCH. (No more the dreaded Roadcruisers roam the land looking for victims!) The climb up the hills is pretty barren, snow patches and what teres there are with leaves just coming out. It's a few miles on before the trees have more leaves, and get bigger: why, they get almost as tall as the occasional house - there's a whole stand must be a good ten foot high just before the first fields of the Codroy valley, and the first piles of cut timber, big enough to load the logging

trucks by hand. And already, on the hillside, a clear cut and skidder trails - and another - Just like B.C.!

Morning coffee break at the Midway Motel and Lounge - sunny, breezy and cool: it's the Yukon over again! It could be the Midway Lodge, halfway up the Klondike highway, instead of Robertson's Junction. And we is near the sea here, even further south than Victoria. But the breeze has something the Yukon doesn't offer: a deep breath of salt on the air, a *real* sea breeze for the connoyzer here, b'y. *That* is only a memory inland.



Jason Parsons (Student Award Winner) and Bob Perkins (Teaching Award Winner)

Winners!

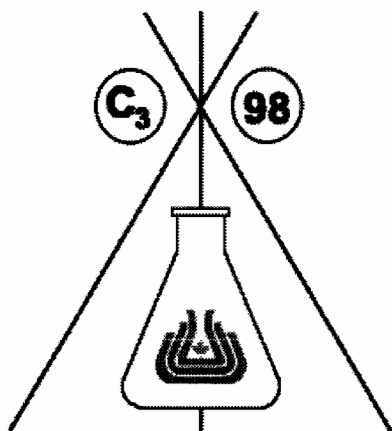
Jason Parsons is the recipient of the C₃ Student Award. Jason is from Cormak (60 km from Corner Brook). He has finished his third year of the Environmental Chemistry stream of the B.Sc. program. He will graduate in June 1998. He is being presented with this award for his high academic average and leadership qualities.

Bob Perkins from Kwantlen University College was the winner of the C₃ Award for Excellence in Teaching. This award has not been presented for several years. It was given to Bob in recognition of his innovative teaching methods and his dedication to chemical education. Bob has had a broad background in teaching chemistry, including several years at Sir Wilfred Grenfell College, hosts of this year's conference. His love for teaching and his students came out during his own seminar presentation at the conference. He remarked, "The college (Kwantlen) just pays me to do marking - the rest (teaching) I do for free."

Chemistry under the tepee

Come next year and participate in the 26th conference of College Chemistry Canada which will be held May 28 to 30, 1998 at Medicine Hat College, Medicine Hat, Alberta

The theme of the conference, chemistry under the tepee, will highlight the chemistry that is conducted in this region of the prairies. Invited papers will (hopefully) include: Aspects of Chemical Warfare (Defense Research Establishment Suffield); Uses of Methane (Methanex Corporation); Chemistry of Brick-Making (I-XL Industries Ltd.); Developing Fertilizers (Canadian Fertilizers Ltd.); Custom-made videos for teaching chemistry (Medicine Hat College).



In addition to the conference program, there will be a fun run to the tepee, a banquet featuring Alberta Beef, and an opportunity to visit the home of the dinosaurs or the majestic Canadian Rockies.

We extend a warm western welcome and look forward to seeing you.

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Visit our Internet site:

www.c3conference98.com



Above, snowball fight breaks out on the hike in Gros Morne National Park.

Below, relaxing on Trout River Pond.



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Renewals

If you would like to continue receiving C₃ news, please remember to renew your annual membership. Forward a \$20 cheque to Diane Messervy payable to "College Chemistry Canada."

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