Department of Chemistry Newsletter

UNIVERSITY OF CANTERBURY
Te Whare Wānanga o Waitaha
CHRISTCHURCH NEW ZEALAND

Number 447 February 2012

HoD's comment

Well January has flown by, and the start of the academic year is rapidly approaching. Although a considerable number of academic staff are currently in Dunedin attending the 2012 International Symposium on Macrocyclic and Supramolecular Chemistry, this does not mean that all is quiet in the Department. In fact the number of tasks that need to be completed, before term actually starts, seems to be mounting up quite alarmingly.

A considerable part of my last week has been spent getting to grips with Health and Safety, and in particular planning for 2012. There are going to be several changes in how we do things in order to tighten up some of our operating procedures, and also to ensure that we provide better training for staff and students in line with our legal and moral obligations. Two things of note: firstly, students who wish to demonstrate in our Undergraduate laboratories, must now attend a formal training session before they can do so. Secondly, we are organising fire safety training for all members of the Department. A formal register will be kept of those who have undergone both of these new aspects of training.

The timetable has been at the forefront of recent talk in the tearoom, that melting pot for the solving of all issues facing the Department. The final version went live on Wednesday 1st Feb. Of course it will not be perfect, but for the first time it's been done this way, I actually think it looks pretty good. So, sincere thanks of the whole Department should go to Deb for putting so much effort into this on our behalf. We of course also need to thank the timetabling team themselves who were faced with a huge job to get things sorted out in a very short timeframe. In particular I would really like to thank Emily Brown for being so accommodating as we put the final touches to things over the past week and ironed out those wrinkles and peculiarities that were unique to Chemistry's requirements.

Another hot topic for discussion has been enrolment. Of course at this stage it is rather hard to tell just how many of the 'provisionally enrolled, pre-enrolled, maybe perhaps enrolled, probably thinking about being enrolled etc' students will actually turn up, but contrary to those spreading doom and gloom, things actually don't look too bad. In fact initial figures at 1st Year imply that those enrolments are slightly up on this stage as compared to last year.

Finally for this month, a big thank you to everyone for your forbearance and cooperation with the Contractors working in the Department. This has been at times quite disruptive, and I admit that an individual could possibly think at times that 'some Contractors may not be the most compliant of individuals'. Myself, of course, couldn't possibly make such a comment ☺. In any case the simple fact of the matter is that the work they are doing is a very necessary and an ongoing process that we need to live with, hopefully just for the time being.

AJF

Department Administration News

Note for your diaries:

The compulsory Health and Safety Seminar will be held at 11:00am on Monday 20th February. A register of attendance will be taken.

The Departmental Retreat will be held at Russley Golf Club from 9:00 am until 5.30pm on February 13th for all permanent staff. We hope that the Vice Chancellor will attend the first session. The day is being chaired by Steve Weaver.

- Please advise Sarah Mattsen if you have any special dietary requirements and also if you **cannot** attend, as soon as possible.

The retirement function for Roger Merryweather will take place at 10:00 am on Friday 24th February. All staff are cordially invited to attend.

CMT met on Wednesday 1st February at 1:00pm.

University News

The Faculty of Science Teaching and Learning Workshop entitled 'Getting More Reflective' will take place from noon until 5.30pm on Wednesday 8th February in Kirkwood KE06. Note that lunch is included.

The PVC will be hosting a College of Science Staff Forum from 10.30am until 11.15am on Thursday 9th February in lecture theatre C2. Speakers at the forum will include Jarg Pettinga, Chris Hawker(Manager, Facilities and Operational Services) and Peter Molony (Manager, Estates and Assets). The aim of the forum is to provide an update on CoS buildings, a refresher about earthquake evacuation procedures in preparation for the return of our students and a briefing re the seismic activity we are currently experiencing. There will also be an opportunity for some more general questions.

The College of Science Executive held a four and a half hour (!) Strategy Meeting on Thursday 2nd February. Further details will be disseminated in due course.

Other news

Congratulations to Robbie Currie (PhD Team Fitchett) and Kylie Lloyd who were married on Friday 13th January.

Visitors

Visiting Academics

Welcome to Professors Mark Lipton and Jean Chmielewski from Purdue University, USA

Recent publications

J. Barth, R. Siegmann, S. Beuermann, G.T. Russell and M. Buback, “Investigations into Chain-Length-Dependent Termination in Bulk Radical Polymerization of 1*H*, 1*H*, 2*H*, 2*H*-Tridecafluorooctyl Methacrylate”, *Macromol. Chem. Phys.* **2012**, *213*, 19-28. DOI: 10.1002/macp.201100479

M. Buback, G. T. Russell and P. Vana, "Elucidation of Reaction Mechanisms: Conventional Radical Polymerization", pp. 319-372 in: *Mass Spectrometry in Polymer Chemistry*, 1st edition, C. Barner-Kowollik, J. Falkenhagen, T. Gründling, S. Weidner (Eds.), Wiley-VCH Verlag & Co. KGaA, Weinheim, Germany, 2012, ISBN 978-3-527-32924-3, URL www.wiley.com/WileyCDA/WileyTitle/productCd-3527329242.html .

Davis, B.M., Senthilmohan, S.T., McEwan, M.J. Direct determination of antioxidants in whole olive oil using the SIFT-MS-TOSC assay. *J. American Oil Chemists.* **2011**: 88(6), 785-792. DOI:10.1007/s11746-010.1722.7

Dummer, J., Storer, M., Swanney, M., McEwan, M.J., Scott-Thomas, A., Bhandari, S., Chambers, S., Dweik, R., Epton, M. Analysis of BVOC in human health and disease. *Trends in Analytical Chemistry.* **2011**, 30 (7), 960-967.

Storer, M.K., Dummer, J.D., Cook, J., McEwan, M.J., Epton, M.J. Increased concentrations of breath haloamines are not detectable in airways inflammation using SIFT-MS. *J Breath Res.* **2011**:5 037105 (5pp). DOI;10.1088/1752-7155/5/3/037105

Mahyudin, N.A., Blunt, J.W., Cole, A. and Munro, M.H. The Isolation of a New S-Methyl Benzothioate Compound From a Marine-Derived Streptomyces sp. J. Biomed. Biotech. v2012 (2012), Article ID 894708, 4 pp.

Blunt, J.W., Copp, B.R., Keyzers, R.A., Munro, M.H.G. and Prinsep, M.R. Marine natural products. Nat. Prod. Rep. v29, 2012, 144-222.

Advertisement

A PhD Scholarship available in the group of Richard Payne to work on a HIV Drug Discovery project recently funded by the Australian Centre for HIV and Hepatitis Virology Research. The Scholarship will be paid at the same rate as the Australian Postgraduate Award (ca. $24,000 p.a.). Any students with a background in organic chemistry/medicinal chemistry who maybe interested should please contact Richard Payne directly so that he can provide more information about the project and scholarship.

richard.payne@sydney.edu.au

New Position: Lecturer/Senior Lecturer Physical Chemistry Victoria University of Wellington

We have a position available at the Lecturer/senior lecturer level in Physical Chemistry at Victoria University of Wellington. If you are interested in applying or you know anyone that might be interested in applying please let them know. The link is below and they can contact me for any questions. The position closes the end of February.

http://vacancies.vuw.ac.nz/positiondetail.asp?p=5967

Kathryn McGrath Prof,
Director
MacDiarmid Institute for Advanced Materials and Nanotechnology,
http://www.macdiarmid.ac.nz/
School of Chemical and Physical Sciences
www.victoria.ac.nz/scps/
Riddet Institute
http://riddet.massey.ac.nz/
Direct 04-4635963
Victoria University of Wellington
Te Whare Wananga o te Upoko o te Ika a Maui
PO Box 600
Wellington 6140

Seminars

Upcoming Chemistry Department Seminars

Monday 27th February 2012, 11:00am, Room 531

Jean Chmielewski, AW Kramer Distinguished Professor of Chemistry & Biomedical Engineering, Purdue University

Next Generation Therapies:
Multidrug Resistance & Regenerative Medicine

This seminar will focus on two areas of interest: Inhibition of the multi-drug resistance transporter P-glycoprotein with designed dimeric prodrugs, and the development of collagen peptide building blocks that can be assembled using metal ion/ligand interactions to generate unique micron-scaled structures, such as fibers, spheres, meshes and disks.

P -glycoprotein (P-gp) is an ATP-dependent pump that reduces accumulation of drugs within cells and is a member of a superfamily of membrane transporters. P-gp is over-expressed on the surface of cancer cells and plays a major role in multi-drug resistance in cancer. P-gp is also present on apical side of the luminal membrane of brain capillary endothelial cells (the blood brain barrier), and precludes access of a number of therapies to the brain. By taking advantage of the multiple substrate binding sites within the transporter domain of P-gp, we have developed novel dimeric prodrug inhibitors of P-gp based on the therapeutic agents themselves. Inhibition of P-gp transport with these agents will be discussed.

Collagen is one of the major structural proteins of the extracellular matrix and is found associated with skin, bone, tendons, ligaments, and blood vessels. As such, there is great interest in using collagen for applications in regenerative medicine and tissue engineering. Natural collagen has limitations, however, for these applications due to difficulties in precisely controlling the protein's structure at the nano- and micro-scale and a limited ability to modify its chemical structure. These difficulties could be overcome by using synthetic fragments of collagen (peptides) as building blocks for larger, functional biomaterials. To this end, we have designed collagen peptide building blocks that can be assembled using metal ion/ligand interactions to generate unique micron-scaled structures, such as fibers, spheres, meshes and disks.

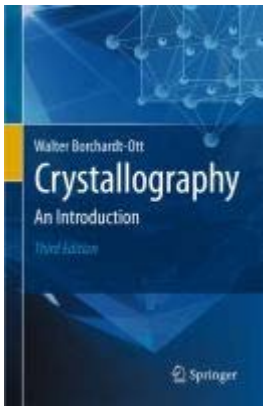
Monday 5th March 2012, 11:00am, Room 531

Professor Mark Lipton, Purdue University, USA, Purdue University

Title: Synthesis and Structure Determination of Bioactive Cyclic Depsipeptides

Abstract: The cyclic depsipeptide natural product callipeltin A has potent antiviral activity against HIV-1. Our efforts towards its total synthesis and understanding of its mode of action will be discussed, as well as the synthesis and structure determination of the related natural product callipeltin B.

EPS library news



New titles

Borchardt-Ott, Walter Crystallography : an introduction (3rd ed.) QD 905.2 .B726 2011
Drysdale, Dougal An introduction to fire dynamics (3rd ed.) [Read online]

Managing bibliographies

- The next "Endnote for Engineers/Scientists" session is 11am February 14th and we'll add more as needed – book a place online.
- ReadCube is free software which imports your PDFs and gets citation details from PubMed and Google Scholar. Won't work if the PDF is basically an image scan of the article, or the article isn't indexed online, but pretty good with most modern articles in the sciences. Can export to Endnote. (Thanks to Vladimir for bringing this to my attention)

Library buildings

Central Library: You can now access levels 2, 6, 8-11 and the study area of level 3. The shelving area of Level 3 and all of Level 4 will be available once the seismic joints have been reset and smoothed over.

EPS Library:

All books remain available by request through the library catalogue. We're working towards opening level 1 for the start of the academic year, though no promises! When we know for certain the information will be on Library News and UC Library on Facebook.

Term 1

Please contact me with any questions about high demand textbooks, or about library/research support for any classes you're teaching this semester.

Deborah
deborah.fitchett@canterbury.ac.nz

This month's Photo Caption

Captions:

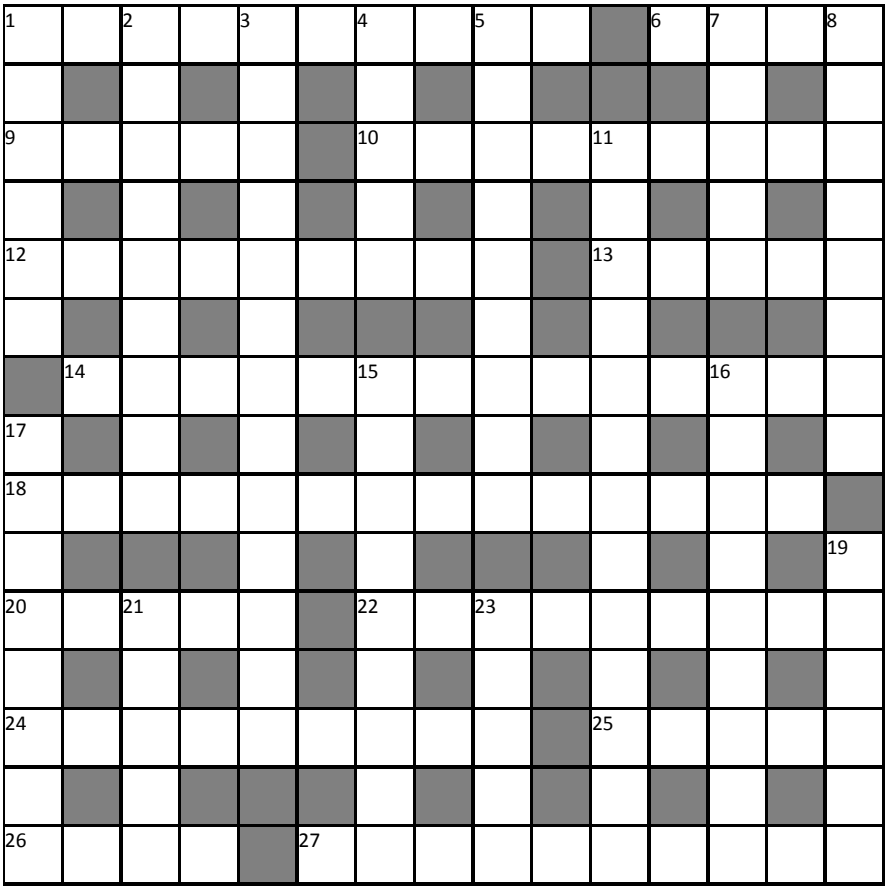
- **"Bugger, did I leave the oven on??"**
- **"Children?? Children?? Nobody said there were going to be children...."**
- **"The steaks have been really good this year. Wait…..where are the reindeer?"**

Next month's photo captions – email to Sarah Mattsen

Monthly cryptic crossword

Across

1 Guitarist, singer, and actor (4,6)
6 Miss with something to keep her hands warm (4)
9 Extra charge made by a key teacher at university (3-2)
10 Hotly pursuing filly, run unwisely round foremost of courses (2,4,3)
12 Without preparation? Pick a cosmetic (4,5)
13 Pound included in bill, for fish (5)
14 One to decline being cuddled by a vivacious, sexy-looking girl? (1,3,2,3,5)
18 Opposing union may cause a financial problem (8,6)
20 Commanding Officer taken round state capital (5)
22 Henley gal adrift in river (9)
24 Old boy at meeting with a fixed idea (9)
25 Hunter - gold one - working (5)
26 Iron uniform (4)
27 An encumbrance? No more with crew (4,6)



Down

1 Offshoot of British cattle farm (6)
2 Son's become confused by talk over bike accessory (9)
3 State of alarm, frightful in satanic spot (5,8)
4 Turn up a hill (5)
5 Drop of lager during fine meal cooked at home (2,7)
7 Article taken from grubby relative (5)
8 Being smart, I take off to test opinion (3,1,4)
11 See tree ahead of group of trees in picture (8,5)
15 I've to appear in FA team in this form of football (4-1-4)
16 Crowd, carefree mostly, by the arena (9)
17 One cadet spinning a yarn (8)
19 Sound of seal in a small pen? Possibly (6)
21 Children - an important subject (5)
23 Ruled in Dublin? Edward? (5)

Monthly cryptic crossword – solution from last month

Degenerate states

A Short Guide to Modern Global Ecownomics

SOCIALISM
You have 2 cows.
You give one to your neighbour.

COMMUNISM
You have 2 cows.
The State takes both and gives you some milk.

FASCISM
You have 2 cows.
The State takes both and sells you some milk.

NAZISM
You have 2 cows.
The State takes both and shoots you.

BUREAUCRATISM
You have 2 cows.
The State takes both, shoots one, milks the other, and then throws the milk away...

TRADITIONAL CAPITALISM
You have two cows.
You sell one and buy a bull.
Your herd multiplies, and the economy grows.
You sell them and retire on the income.

SURREALISM
You have two giraffes.
The government requires you to take harmonica lessons

AN AMERICAN CORPORATION
You have two cows.
You sell one, and force the other to produce the milk of four cows.
Later, you hire a consultant to analyze why the cow has dropped dead.

ENRON VENTURE CAPITALISM
You have two cows.
You sell three of them to your publicly listed company, using letters of credit opened by your brother-in-law at the bank, then execute a debt/equity swap with an associated general offer so that you get all four cows back, with a tax exemption for five cows.
The milk rights of the six cows are transferred via an intermediary to a Cayman Island Company secretly owned by the majority shareholder who sells the rights to all seven cows back to your listed company.
The annual report says the company owns eight cows, with an option on one more.
You sell one cow to buy a new president of the United States , leaving you with nine cows.
No balance sheet provided with the release.
The public then buys your bull.

A FRENCH CORPORATION
You have two cows.
You go on strike, organize a riot, and block the roads, because you want three cows.

A JAPANESE CORPORATION
You have two cows.
You redesign them so they are one-tenth the size of an ordinary cow and produce twenty times the milk.
You then create a clever cow cartoon image called 'Cowkimon' and market it worldwide.

A GERMAN CORPORATION
You have two cows.
You re-engineer them so they live for 100 years, eat once a month, and milk themselves.

AN ITALIAN CORPORATION
You have two cows, but you don't know where they are. You decide to have lunch.

A RUSSIAN CORPORATION
You have two cows.
You count them and learn you have five cows.
You count them again and learn you have 42 cows.
You count them again and learn you have 2 cows.
You stop counting cows and open another bottle of vodka.

A SWISS CORPORATION
You have 5000 cows. None of them belong to you.
You charge the owners for storing them.

A CHINESE CORPORATION
You have two cows.
You have 300 people milking them.
You claim that you have full employment, and high bovine productivity.
You arrest the newsman who reported the real situation.

AN INDIAN CORPORATION
You have two cows.
You worship them.

A BRITISH CORPORATION
You have two cows.
Both are mad.

AN IRAQI CORPORATION
Everyone thinks you have lots of cows.
You tell them that you have none.
No-one believes you, so they bomb the f**k out of you and invade your country. You still have no cows, but at least now you are part of Democracy....

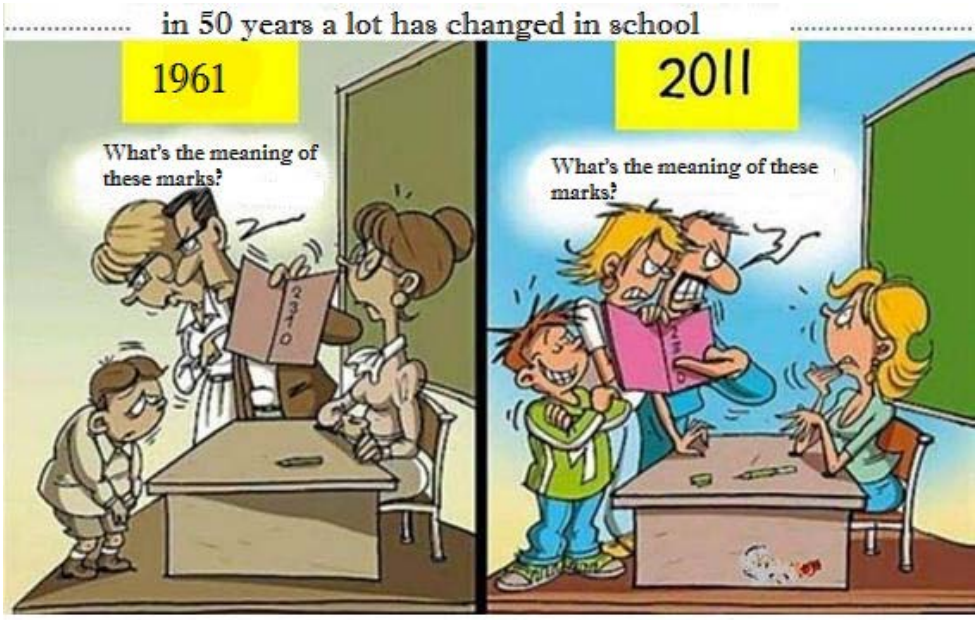
AN AUSTRALIAN CORPORATION
You have two cows.
Business seems pretty good.

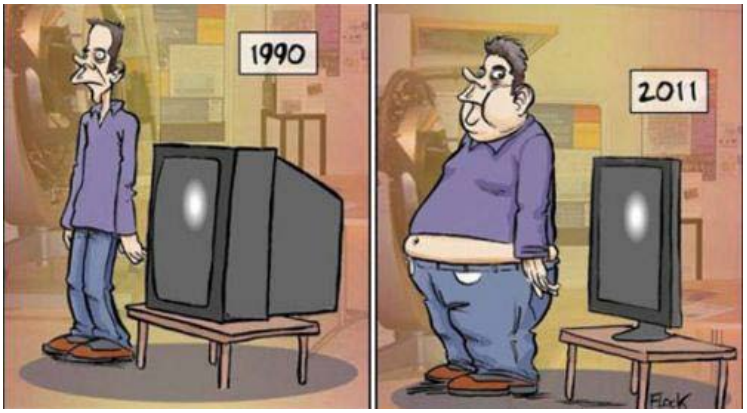
You close the office and go to the pub for a few beers to celebrate.

A NEW ZEALAND CORPORATION
You have two cows.
The one on the left looks very attractive.

A GREEK CORPORATION
You have two cows.
You borrow against the cows from the Germans
You kill the cows and make souvlaki.
You can't pay the interest so the Germans lend you more money. You can't pay the interest so the Germans lend you more money. You can't pay the interest so the Germans lend you more money. You can't pay the interest so the Germans lend you more money .....

HOW THINGS HAVE CHANGED!





Photos

The Rutherford Shield is the prize of ascendancy in the noble sport of cricket between the Departments of Chemistry and Physics & Astronomy. It has a long but largely undocumented history, although the trophy itself records a few of the facts.

In earlier times it was contested at least annually. In 1987 the departments drew a two-game series; then came an eleven-year period of chemistry dominance before P&A achieved a victory in 2000. At that point the contest went into hiatus until Chemistry won in 2005 and 2006. The last recorded contest, in 2007, which convincing won by P&A. Since then the "Shield" has gathered dust somewhere in the north wing of the Rutherford Building.

In early January, perhaps inspired P&A's success in last year's football match, Ojas Mahapatra, a PhD student with Simon Brown, tempted Chemistry to into a challenge. Andrew Gross organized the Chemistry team and a pitch was booked on Ilam Fields for the afternoon of Thursday 19 January.

The day was fine, hot and breezy, with a strong nor'wester predicted for later in the afternoon. The rules were established – 30 overs per team with no bowler allowed more than five. Each batting team was permitted up to twenty wickets with a minimum of 11 batsmen, who had to retire when they exceeded 30 runs. After each batsman had batted once, the order could be recycled up to the limit of 20 wickets.

Chemistry won the toss and chose to bat. Shane Verma and Richard Hartshorn made excellent early progress before Shane was run out by a sharp piece of fielding. After a brief cameo from Markie Russell, Paul Geraghty and Richard had us rollicking along till they had to retire at 31 apiece. At that point we suffered a bit of a middle-order collapse, with only Greg Russell holding his composure in the face of some crafty bowling by spin twins Mayun and Amir. When Greg retired at 30 and Jonathan Kitchen was run out for 8, thing looked dire. But some lust hitting and quick running by our "tail enders" (Brad, Alan, Ryan, Will and Balaji) saw us accelerate to a final score of 197.

Requiring somewhat over a run a ball Chemistry's total appeared to be a solid challenge. But Mayun and Ojas looked to be making short work of it, even in the face of some accurate bowling, especially from Jonathan and Shane. Paul came on to remove Mayun and then struck again in his second over. Further relief came when Ojas had to retire on 30. But Antony (retired on 31), Simon Brown (20) and Amir (24) had little trouble in keeping up with the required run rate. Eventually we broke through, but that was an error; Jonathan and Bryce rattled through the tail, which meant that P&A could start with again with their top order! Even worse, our best bowler, Richard, had been away at a meeting for the whole of the P&A meeting. Mayun elegantly scored another 31 runs (then retired), but Greg had Ojas caught and bowled for just one (in retrospect a very crucial dismissal). P&A's best batsmen were gone, but they needed only 17 runs off the last three overs. Jonathan had one over to bowl, but we had no idea as to who could bowl the other two! Then a miracle – Richard returned.

In the third-to-last over he took a wicket for just four runs. Jonathan bowled an excellent six-run over into what was now a nor'wester gale, which left one over with seven runs required. Richard's first two balls went for three leaving four runs required off four balls. His third delivery bowled Antony and his fourth conceded a (dubious) single. His fifth ball beat the bat, so with three runs required off the last ball we could afford to concede a single and spread the field. In the end that was unnecessary since Richard again beat the bat and we had won by two runs!

This was an excellent game played in great spirit, though spoiled somewhat by the strong wind and high temperature. In the end, Chemistry was probably lucky to win – but we'll take it. Afterward we adjourned to the P&A seminar room for drinks and nibbles and to pick up the "Shield". Thanks to Ojas for prompting us to play and for organizing the match and after-match venues. Thanks also to Andrew Gross for organizing the chemistry side of the event and taking photos.