Dr. Alfred Bader
924 East Juneau, Suite 622
Milwaukee, Wisconsin 53202
Phone: 414/277-0730
Fax: 414/277-0709

A Chemist Helping Chemists

August 15, 1996

Dr. John Emsley
Department of Chemistry
Imperial College
London SW7 2AY
England

Dear John:

I so enjoyed your article on water in the August issue of *Chemistry in Britain*.

But I am very concerned by the letter from an Italian professor on page 22 pointing out that a mixture of just 1 milliliter of cyclooctatetraene and dimethyl acetylenedicarboxylate led to an explosion that shook a three-story building. The mixture had to be heated to 140° C., but terrorists might be able to heat such a mixture of two more or less available liquids under pressure, with disastrous results.

With best wishes, as always,

AB/cw

Dr. Alfred Bader
924 East Juneau, Suite 622
Milwaukee, Wisconsin 53202
Phone: 414/277-0730
Fax: 414/277-0709

A Chemist Helping Chemists

August 9, 1996

Dr. John Emsley
Department of Chemistry
Imperial College
London SW7 2AY
England

Dear John:

I so enjoyed getting together with you last month and then chatting several times by telephone, particularly about the legal problems faced by Coalite Chemical.

I do hope that you will have a chance to visit Dr. George Danson in Bolsover and then write one of your interesting stories.

Just on the day I was leaving England, I read the enclosed article in that day's *Times* showing that an airline which 182 people at serious risk was fined £150,000 plus £25,000 costs. Compare that with twice that fine levied against Coalite Chemical for an act of so much slighter consequences.

I fear that the judgment against Coalite Chemical was as much political as legal and makes me ask "Where is British justice?"

With best personal regards from house to house, as always,

AB/cw

bc: Dr. George Danson

Dr. Alfred Bader
924 East Juneau, Suite 622
Milwaukee, Wisconsin 53202
Phone: 414/277-0730
Fax: 414/277-0709

A Chemist Helping Chemists

April 3, 1996

Dr. John Emsley
Department of Chemistry
Imperial College
London SW7 2AY
England

Dear John:

The enclosed communication from Coalite Chemical will be self-explanatory. I chatted with Dr. Danson and asked him whether he minded if I shared this with you, and he said certainly I could send this.

With all good wishes from house to house, as always,

AB/cw

Dr. Alfred Bader
924 East Juneau, Suite 622
Milwaukee, Wisconsin 53202
Phone: 414/277-0730
Fax: 414/277-0709

A Chemist Helping Chemists

January 31, 1996

Dr. John Emsley
Department of Chemistry
Imperial College
London SW7 2AY
England

Dear John:

Thank you so much for your delightful letter of January 24th.

To answer your last question, Tom Cori had three close associates. Aaron Fischer has departed, to Hell if there is one. So has Don Brandon. The third, Andy Newman, is still around, but his company, Edison Brothers Stores, has gone bankrupt, and investors have lost many millions of dollars as they saw the stock of his company slide from 30 to about 1.

The fact of the matter is that I am a great deal happier today than I was five years ago. I divide my time between helping chemical companies such as Coalite Chemical and JRD, buying and selling many paintings, and working on a new book, this one on Biblical paintings. I am busier now but also happier.

I think that in the next couple of months, the management of Coalite Chemicals will be deeply involved in legal problems associated with dioxins. But after that, you and they might enjoy talking to each other, and I think that you will find a great sotry there. Of course you know that Bolsover is just off the M-1.

With all good wishes from house to house, I remain,

Yours sincerely,

AB/cw

IMPERIAL COLLEGE OF SCIENCE, TECHNOLOGY AND MEDICINE
Department of Chemistry
South Kensington
London SW7 2AY

From the Science Writer in Residence
Dr John Emsley DSc FRSC

Dr Alfred Bader
2961 North Shepard Avenue
Milwaukee
Wisconsin 53211
USA

24 January 1996

Dear Alfred,

Thank you for your kind remarks about my vitamin C article in *Chemistry in Britain* - I too take it regularly, although I only take 500 mgs once a week. I started taking vitamin C when I was a student. At the time I had a succession of boils and mouth ulcers, my lips and gums were cracked and bleeding and I could hardly stay awake during the day. The doctor diagnosed vitamin C deficiency, gave me some ascorbic acid capsules, and I quickly recovered. It was all my own fault really, living on typical student fare with no fresh fruit or vegetables.

I've never heard that drinking urine could prevent scurvy, and I'm sure it wouldn't. I know excess vitamin C is not retained by the body, but it doesn't exit as such, so there would be no point in instituting a recycling policy.

I read the chapter from *Strategic Management* with interest, but just as it got really interesting the story stopped. I didn't realise that readers were meant to suggest alternative endings. I wonder what the 'correct' answer is supposed to be? As you know my reaction would be to put a curse on the lot of them and wait and see what happens, but I don't suppose that counts as useful management strategy! The best advice I suppose is to accept defeat gracefully, and then sit on the bank of the river and wait for the bodies of your enemies to float by - as they invariably do. Any sign of TC yet?

Kind regards,

John

PS. No contact with Coalite, but I've been too busy to want extra work at the moment, so I haven't felt the need to phone them.

Imperial College phone: 0171-594-5730
Home address: 14 The Fairway, New Barnet, Herts, EN5 1HN
Home phone: 0181-449-9964   Home fax: 0181-441-4380

Dr. Alfred Bader
924 East Juneau, Suite 622
Milwaukee, Wisconsin 53202
Phone: 414/277-0730
Fax: 414/277-0709

A Chemist Helping Chemists

January 17, 1996

Dr. John Emsley
Department of Chemistry
Imperial College
London SW7 2AY
England

Dear John:

I have just read your fascinating article on Vitamin C in *Chemistry in Britain*. Isabel and I each take 1 gram a day, and it may well be like chicken soup: It won't do any harm.

How true is the story I've heard time and again that sailors centuries ago discovered that they didn't get scurvy if they drank urine? Two 500-mg are more pleasant.

The enclosed case study will amuse you.

With all good wishes from house to house, I remain,

Yours sincerely,

AB/cw

Enclosure

IMPERIAL COLLEGE OF SCIENCE, TECHNOLOGY AND MEDICINE
Department of Chemistry
South Kensington
London SW7 2AY

From the Science Writer in Residence
Dr John Emsley DSc FRSC

English
Leig file

Dr Alfred Bader
2961 North Shepard Avenue
Milwaukee
Wisconsin 53211
USA

11 October 1995

Dear Alfred,

I don't know Jim Baggott's address in South Africa but his permanent home address in Britain is:

199 Beech Lane,
Earley,
Reading,
Berks RG6 2UP.

The magazine *Chemistry Review,* in which his article on the discovery of the structure of benzene appeared, is published by a group sponsored by the Chemical Industry and based in the Education Department at York University. It is aimed at secondary school children but it often carries articles by people from industry and I find them very useful. I enclose a photostat of the credits, and as you will see I am a member of the advisory panel, although my main contribution is permitting them to reproduce items of mine which appeared in *Chemistry in Britain* or *The Independent.*

The 150th anniversary celebrations at Imperial were built round a two-day conference in September and all the big names were there: Geoff Wilkinson, Derek Barton, Steve Ley, Jack Baldwin, Phil Magnus, etc... My main contribution was the piece in *Chemistry in Britain* - see enclosed.

I look forward to seeing you again in November/December.

Kind regards,

John

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Volume 5 N

Regular columns

Dreams of Imperial splendour

Imperial College Archive

This month marks the 150th anniversary of the Royal College of Chemistry, which eventually became Imperial College, London. Its founders wanted it to produce chemists who would appreciate the needs of industry, and this it has done. Is it still doing so? And what of the next century?

John Emsley

THE ROYAL COLLEGE of Chemistry (RCC) was originally founded in 1845, in response to growing concerns over the failure of the British Empire to develop a chemical industry. It was hoped that the RCC would remedy this by teaching mainly practical chemistry.

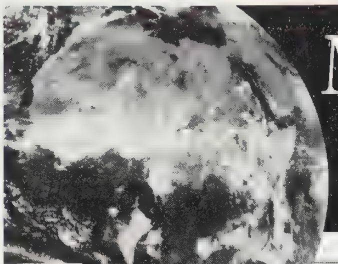
Prince Albert was a keen supporter and, together with Queen Victoria, he interviewed the brilliant 28-year-old chemist, August von Hofmann, and persuaded him to come to London as the RCC's first professor. In September 1845 the college opened its doors to 26 students. Hofmann became famous for the Hofmann reaction and the Hofmann degradation, but it was his laboratory assistant William Henry Perkin who more than fulfilled the founders' dreams when he discovered and patented the first aniline dye, mauveine, when he was only 18 (*Chem. Br.*, 1995, **31**, 547). In effect, Perkin started the modern dye industry, and his income quickly reached £60 000 pa (equivalent to over £3m at today's prices).

In the century that followed, the college had many famous chemists on its staff whose researches had far-reaching applications: Edward Frankland, founder of organometallic chemistry, William Crookes, discoverer of thallium and cathode rays, Patrick Linstead (phthalocyanine dyes), Richard Barrer (zeolites) and Nobel laureate Sir Derek Barton, who this year received the American Chemical Society's most prestigious Priestley medal for a lifetime's work, the highlights of which were phenol oxidative coupling, conformational analysis and radical chemistry.

Another Nobel prizewinner associated with the department is Sir Geoffrey Wilkinson, who runs a research group in his eyrie on the eighth floor, refurbished by Johnson Matthey, the precious metal company. Wilkinson is best known for the eponymous catalyst used to promote highly selective hydrogenation reactions. He is currently producing noteworthy discoveries in a new area of inorganic chemistry: high oxidation state metals surrounded by low-electronegativity ligands, *eg* $\mathrm{Mn^{VII}(NBu^t)_3Cl}$, a combination regarded as mutually incompatible only a few years ago.

Star performance

IC is still one of the UK's top departments; witness its five star rating for research in 1992 and its 'excellent' for teaching in



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Dr. Alfred Bader
2961 North Shepard Avenue
Milwaukee, Wisconsin 53211

A Chemist Helping Chemists

September 26, 1995

Dr. John Emsley
Department of Chemistry
Imperial College
London SW7 2AY
England

Dear John:

Thank you so much for sending me the paper, "Who discovered the structure of benzene?" by Jim Baggott, published in *Chemistry Review.*

Could you perhaps send me Jim Baggott's address in South Africa? His paper is really a well-balanced paper, and I want to thank him and tell him a little about the Loschmidt Symposium.

I much look forward to seeing you again in November.

With all good wishes, I remain,

Yours sincerely,

AB/cw

[illegible]

Home address: 14 The Fairway, New Barnet, Herts, EN5 1HN.

IMPERIAL COLLEGE OF SCIENCE, TECHNOLOGY AND MEDICINE
DEPARTMENT OF CHEMISTRY
South Kensington
London SW7 [illegible]

From the Science Writer in Residence
Dr John Emsley DSc FRSC

Dr Alfred Bader, fax no = 0101-414-962-8322
2961 North Shepard Ave, Milwaukee

3 June 1994

Dear Alfred,

I have just received my copy of *Chem& Eng News* for 9 May and read the wonderful news that you have been awarded the Parsons Award by the ACS in recognition of your years of public service. Congratulations! It was also delightful to read the long feature they had written about you, and the charming photograph of you and Isabel. Tom Cori must really be squirming - he's never going to be recognised with such an honour.

You should soon be receiving a letter from Tony Barrett about his impending visit to the USA on a fund-raising tour, as part of the 150th anniversary of the IC chemistry department. I hope you will agree to meet him, and give his plans a fair hearing.

Regarding the fluorine article and BNFL: I am having lunch with the Clive Cookson of the *Financial Times* next week when I hope to persuade him to let me write a piece for them. If that happens then I will contact Michael Buxton *et al.* Keep you fingers crossed!

Kind regards to you both - and again our congratulations.

John

John Emsley

Pages to follow = 0

Imperial phone = 071 589 5111 ext 4625 fax = 071 823 7353
Home phone = 081 449 9964 fax = 081 441 4380 (from outside UK = +44-81-441-4380)
Home address: 14 The Fairway, New Barnet, Herts, EN5 1HN.

Dr. Alfred Bader
924 East Juneau, Suite 622
Milwaukee, Wisconsin 53202
Phone: 414/277-0730
Fax: 414/277-0709

A Chemist Helping Chemists

May 14, 1997

Dr. John Emsley
Department of Chemistry
Imperial College
London SW7 2AY
England

Dear John:

Recently Isabel and I met with the first Czech Bader Fellow to come to the United States. Miroslav Rezac came to Columbia, worked with Ronald Breslow, got his Ph.D. and is now post-Doc in Berkeley.

We met with him at the ACS meeting in San Francisco and he made some very valuable suggestions, how to help in-coming students, and I enclose his comments.

Could you please pass these on to the person looking after the Bader Fellows coming to Imperial College.

As you know, the first received his Ph.D. from Willie Motherwell and I would very much like to meet the second Bader Fellow now in London, during our next visit.

Could you please help me by telling me who he is and with whom he is working.

With all good wishes, from house to house,

As always,

AB/nik

Enclosure

bc: Hannah Evans

ALFRED BADER FINE ARTS

DR. ALFRED BADER ESTABLISHED 1961

April 26, 1995

Page 1 of 5

TO: Dr. John Emsley
FAX: 44-181-441-4380

Dear John:

Thank you so much for your fax of yesterday and that truly wonderful review. I know of only one chemist who could write such a masterpiece: John Emsley.

As you will see, all of my suggestions are trivial:

1) I am certainly not the world's richest chemist. Forbes Magazine publishes a list of the 400 richest Americans, some of whom are chemists, and I am certainly not among them. I don't go around monthly or annually calculating what I am worth. However, most of my fortune is in Sigma-Aldrich stock, of which I own 2.8 million shares. Recently the stock has been as low as 30 and is now around 40.

2) The correct name of the company is Sigma-Aldrich Corporation.

3) I didn't really work on soybean oil at PPG, but on making new monomers such as the many unsaturated phenols.

4) There was really only one major chemical supplier, Eastman-Kodak.

5) Sigma-Aldrich's sales in 1994 were $851.2 million. This year sales will certainly be above $900 million.

6) I wasn't staying at the Russell Hotel on November 20, 1991, but was told to come there by Tom Cori.

7) I am certainly not a scholar on the Old Testament, but could fairly be called a student.

8) This is the only suggestion I would like to make which is not factual. May I ask you to leave out a reference to the laws of libel? I am certain that Tom Cori will have libel lawyers check the book, but they don't need encouragement and then be able to point to your review.

By Appointment Only
ASTOR HOTEL SUITE 622
924 EAST JUNEAU AVENUE
MILWAUKEE WISCONSIN USA 53202
TEL 414 277-0730 FAX 414 277-0709

As you will see, I am a nit-picking character of Germanic upbringing who can even suggest corrections for such a wonderful review.

If this review won't encourage chemists in Britain to buy the book, nothing will.

I think that you will be interested in Professor Bruce Buchan's article on the actions of the Board anyway, and so I am sending that to you by air mail. *

With fond regards from house to house, I remain,

Yours sincerely,

AB/cw

* Of course I have his permission to send it.

Adventures of a Chemist Collector
Alfred Bader
Weidenfeld & Nicolson, London, 288 pages, £14.95 hbk
ISBN 0-297-83461-4

This is the autobiography of a remarkable man. Alfred Bader is one of the world's ①② richest chemists and was founder of the Sigma-Aldrich Corporation, the leading supplier of research chemicals. He is also a major player in the art world where he has built up a famous collection of Old Masters. Bader ha~~d~~s led a life full of drama, and *Adventures of a Chemist Collector* tells tales of tender love and tough negotiations, of contacts who befriend and colleagues who betray. Put them all together and you have one of the most fascinating books I have ever read.

Bader was born in Vienna in 1924, the son of a Jewish father and a Catholic mother. His father was murdered soon after Alfred was born, and his mother was disowned by her family because of her runaway marriage. Unable to support her family, she agreed that Alfred should be raised by his aunt. Despite all this, Bader had a happy childhood, spiced with a keen interest in football, but his world fell apart when the Nazis took over Austria in 1938.

Bader was lucky in that he was able to leave his homeland in December that year as one of a consignment of 10,000 Jewish children who were allowed to come and live in Britain. Here he was able to continue his education at the East Hove Senior School for Boys, followed by Brighton Technical College. But this was not to last.

After the defeat of the Allied armies in France in 1940, the British government, fearful of spies and saboteurs, rounded up all refugees from Nazi-occupied Europe. Bader was deported to Canada, but there he continued his studies, struggled to get to university, and eventually was accepted by Queen's. The kindness he found there he has never forgotten, and he has since lavished on them gifts of paintings, massive donations and a castle - Herstmonceux in Sussex - which is now their European campus.

Bader earned his PhD with the great Louis Fieser at Harvard and then went to work in Milwaukee for the paint division of Pittsburgh Plate Glass Company, where he worked on new ③ monomers. There he became frustrated by the take-it-or-leave-it attitude of the major chemical ④ supplier, Eastman Kodak, and so with a friend, Jack Eisendrath, they started their own

company. This they called Aldrich after Eisendrath's girlfriend, Betty Aldrich, and ran it from a rented garage. It soon gained a reputation for speedy and reliable service and grew to become ⑤ the close to a billion ~~D~~dollar business empire we know today.

If would-be millionaires with chemistry degrees would like to know how it's done, then here is the recipe for success: find your niche and follow Bader, paying special attention to customer relations. Bader himself became Aldrich's greatest advert and asset, touring the world asking chemists at the bench what they wanted, seeing that they got it, and sometimes buying what they themselves had made. I must confess that I found some of the details of business negotiations in *Adventures of a Chemist Collector* rather hard going, but then comes a riveting Chapter 13. In it we learn how, on 20 November 1991, disaster struck while Bader was at the ⑥ Russell Hotel, London, and his life's work was wrested from him.

Throughout all his triumphs and tribulations, Bader has clung to his Jewish faith. He has ⑦ been a life-long student of the Old Testament, sometimes profitably so, when this has enabled him to recognize the obscure subject of a painting and correct the experts. At other times, no doubt these Biblical stories helped him to withstand his tribulations.

In a curious way, *Adventures of a Chemist Collector* resembles a book of an Old Testament prophet, with its tales of greed and deception, love and loyalty. In this latter category was his love affair with his present wife, Isabel, which began as a shipboard romance and progressed through unexpected coincidences, heartbreaking letters, and even an prophetic dream.

There is also Bader's claim that Josef Loschmidt was the first to work out the structure of benzene, rather than Kekulé. This brought Bader the sting of academic venom when he wrote about it in *Chemistry in Britain*. He entertains us with extracts from a reader's letter to the editor, which naturally could not be published.

Another Bader tale is the embarrassing one of what can happen when you try to give money away to help students. What appears so easy turns out rather difficult when you do it for the Chemistry Department of Sheffield University. Members there would be well-advised to skip Chapter 22.

Much of *Adventures of a Chemist Collector* is devoted to Bader's other life as an art collector. In recent years, he has bought and sold individual paintings worth millions of dollars, but it is his joy at finding hidden masterpieces which he recounts in most detail. Pictures darkened by layers of varnish, or by an unknown artist, or of doubtful attribution, have been

rescued from obscurity. Having them cleaned and revealing their beauty was a joy he shared with the 200,000 chemists worldwide who received copies of his *Aldrichimica Acta*, the free journal sent out by his company. Bader reproduced his Old Masters on its cover, and the company has continued to publish works of art this way, unwilling to break the tradition, even though it broke with its founder.

⑧

Few people write their autobiography so well and with such candour as Bader. He tells all, including details that a normal writer might avoid. When you have a fortune, you can afford a few little luxuries like telling the whole truth. This is what really makes the *Adventures of a Chemist Collector* such compelling reading.

John Emsley

2-8-93

FAX FROM

DR. ALFRED R. BADER
Suite 622
924 East Juneau Avenue
Milwaukee, Wisconsin 53202
Telephone 414-277-0730
Fax No. 414-277-0709

February 8, 1993

TO: Dr. John Emsley Via Fax 011 44 71 589 3869

Department of Chemistry, Imperial College 81 441 4380

Dear John:

Thank you so much for your fax of today. The Imperial Mole is illuminating and busy as always.

May I ask you to make two minor changes to correct the facts: The bank was asking L 5 million, and I wish I could have bought it at half price. Could you just say that "...Alfred stepped up with a cash offer and snapped it up." Also, I was not the buyer, but Queen's University, and Isabel and I agreed to give Queen's University L6 million to cover both the purchase price and the cost of renovation.

I very much look forward to the February ** copy of this fine publication.

Fond regards from house to house, * also March, April ...

Alfred

** February just received. Great!

"Say, who the hell's been writing this stuff? It comes perilously close to the truth."

Dr. Alfred Bader
2961 North Shepard Avenue
Milwaukee, Wisconsin 53211

December 29, 1992

Dr. John Emsley
Department of Chemistry
Imperial College
London SW7 2AY
England

Dear John:

It was such a pleasure to spend some time with you earlier this months and then to hear the great news that Willie Motherwell has been offered the chair at University College. It couldn't happen to a greater guy.

I have been thinking about your pithy and amusing comments as "The Imperial Mole." However, I have one further misgiving I would like to share with you: Tom Cori is one of the most miserable, selfish and arrogant people I know, but he is no Adolf Hitler. Hitler had it in him to kill millions of people; Cori is too smart to kill even one. It minimizes the horrors of the holocaust to compare Cori, a megalomaniac, with Hitler.

Please do consider changing the comparison with Hitler. Cori is a dictatory and you could make that very clear without the reference to Hitler.

All good wishes for 1993.

Sincerely,

FAX FROM

DR. ALFRED R. BADER
Suite 622
924 East Juneau Avenue
Milwaukee, Wisconsin 53202
Telephone 414-277-0730
Fax No. 414-277-0709

February 8, 1993

TO: Dr. John Emsley Via Fax 011 44 71 589 3869

Department of Chemistry, Imperial College

Dear John:

Thank you so much for your fax of today. The Imperial Mole is illuminating and busy as always.

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I very much look forward to the February* copy of this fine publication.

Fond regards from house to house,

* also March, April.

Alfred

*"Say, who the hell's been writing this stuff?
It comes perilously close to the truth."*

SPECIAL RESEARCH ISSUE

Imperial College
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No. 29, March 1993
Editor-in-Chief: David Phillips; Editor: John Emsley

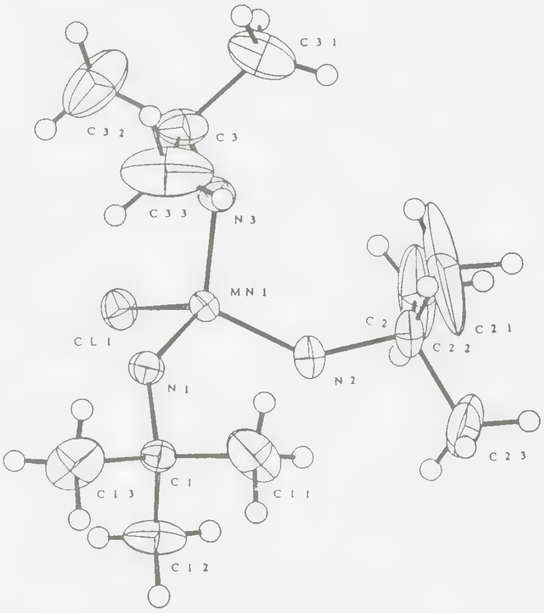
Shock revelations

Department's Nobel prizewinner reports iridium breakthrough

At the inorganic research seminar on Thursday 25 February, the audience were electrified when Professor Sir Geoffrey Wilkinson spoke about the amazing iridium chemistry recently uncovered in his labs by Dr Robyn Hey-Motherwell. They were quite unprepared however for the shock of hearing the great man refer to the commercially available iridium trichloride and iridium tetrachloride as "not what it said on the bottle!"

In a rare public appearance, Sir Geoffrey revealed several new iridium compounds: $Ir(mes)_3$, $Ir(mes)_4^{0,+}$, and $Ir(mes)_3(O)$ with the first-ever Ir=O bond [mes = mesityl]. In addition he reported a remarkable, cherry-red substance that was made from an aberrant batch of "$IrCl_3.nH_2O$". This new material could only be made if the chloride was heated at 170° to convert lattice water to Ir-coordinated water. Another surprise was that so-called "$IrCl_4$" not only contained water but was actually Ir(III). The large audience, which included Sir John Cadogan, gasped in disbelief.

Then just as they thought they had heard everything, Geoff ended his remarkable talk with a further bombshell. This is about to appear in print in *Journal of the Chemical Society, Chemical Communications,* and reports the work of Dr Andreas Danopoulos who has made $ClMn^{VII}(NBu^t)_3$, mp 92°, an analogue of $ClMnO_3$. But whereas the latter detonates at 0° the former is stable. A purple solution of the ion, $Mn(NBu^t)_4^-$, similar to MnO_4^-, has also been prepared. These manganese compounds are the first Mn(VII) derivatives known in which there are no MnO bonds. At the end of his talk the near-capacity audience broke into spontaneous and prolonged applause. "The best seminar I have heard for years," said one well-known inorganic chemist.



CDN BRINGS YOU THE FIRST EVER PICTURE OF GEOFF'S Mn(VII) MOLECULE THAT CONTAINS NO OXYGEN!

ALSO IN THIS ISSUE: USEFUL FOOTNOTES FOR YOUNG PEOPLE

Tim saves 50%

Lucky Dr Tim Jones was about to purchase an electron energy loss spectrometer (EELS) the other day costing about £100,000 when he discovered that the Manchester firm from which he was about to order the equipment had gone bust. However canny Tim rang the firm nevertheless and found to his delight that they were still in business, having been taken over by a Swedish firm called AtomTech, who were willing to sell him the same piece of apparatus with lots of additional features for the same price. The additional features include a complete vacuum system, analyzer and X-ray source which Tim will use for photoelectron studies. Together these 'freebies' are worth about £50,000. Tim's first-year postgrad Alex Aquino will soon be working with the new equipment and was overjoyed: "I never dreamt that my research into molecules adsorbed on to the surfaces of semi-conductors would involve such wonderful equipment," he told our reporter.

Don't forget to add on those little extras, folks

Staff who are applying to the ever-bountiful Chemistry Board of the Science and Engineering Research Council should add the following to their applications:
Synthetic chemistry projects: claim £11,000 (£8,000 for consumables and £3,000 for minor equipment.)
Non-synthetic projects: claim £9,000 (£6,000 for consumables plus £3,000 for minor equipment. However if the project is built round an existing piece of major equipment you can only claim the £6,000 consumables.)
Theoretical projects: claim £3,000 (£2,000 for consumables + £1,000 for minor equipment.)

Dear Gabbar Singh (PG),

Thank you for your contribution to CDN, which we are willing to publish in full. However we need assurance that the shocking revelations which it contains are factually correct. Please call at the CDN office, room 238, as soon as possible. The Editor

Sue says good-bye

Popular Susan Freedman, who has been working as an admissions secretary in the General Office, left on Friday 19 February. Sue's friends treated her to a meal at Pizza Express, South Kensington, to say farewell and presented her with a leaving present to mark her seven years in the dept. Sue was Prof David Phillips's secretary before she left to have a baby in 1992. Now she intends devoting more time to her family and is seeking employment closer to her home in Kent. "We are sorry to see Sue go, and we all wish her well," said Rosalie Greener.

UCCA bombshell!

In our February issue we reported that there has been a 2% increase in the number of 18-year-olds applying to do chemistry at university. This turns out not to be the case, as revealed in a highly controversial report from UCCA, the Universities Central Council for Admissions. (A secret copy was slipped under the door of the *CDN* office by a well-wisher last month.) Now the true story can be told! Despite a massive increase of 21% applying to university, there has actually been a *drop* in the numbers wanting to study chemistry:

	1992 applicants	1991 applicants	Percent change
Chemistry	16,944	17,371	-2.5%
Physics	14,675	13,793	+6.4%
Total applicants	256,029	234,226	+21%

We can explain the 21% increase - what else can young people do? - and even see that a few of them would want to do physics. But the overall *decrease* in the numbers applying to chemistry is a mystery. However you'll be pleased to know that there has actually been a 10% ***increase*** in the numbers applying to IC. Interviewed by *CDN*, Dr Margaret Goodgame our Admissions Officer, said; "I do not understand the national figures. As far as IC is concerned we have never been so popular. We have been inundated with applicants for 1993."

P.S. Don't let on, folks, but Margaret spends a lot of her time in Summer going round the country attending careers fairs.

Sue sees red

In an anguished plea to researchers in the dept, the safety administrator, Sue Johnson, called for the red glass bins to be used only for broken glass. A perplexed Sue told *CDN*: "It's strange what some people use them for: they are not meant for soaking glassware in. One lab is a *black hole* for red bins - they have gone through four times their quota and keep asking for more! I wonder what they are using them for: making sand castle? jelly moulds?"

Seriously folks, if you need buckets for soaking glassware, and cannot get them from the stores, then please tell Sue.

GAS ALERT! A cylinder of nitrogen costs only £3.14, but if you keep it for six months the cylinder rental costs the dept over £30.

IC edges up to no. 2

The contents of a classified document, ranking UK university science depts according to the A-level scores of their student intake, puts IC at position no. 2. Previously we were at 4. The figures for the top ten universities are:

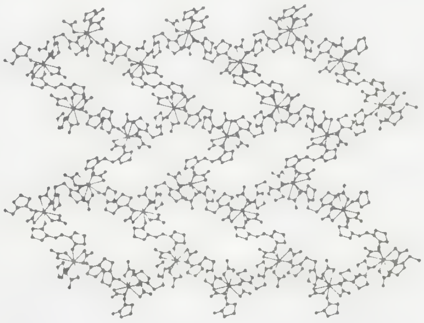
	1991	1990	1989
1 Oxford	**29.3**	29.1	29.2
2= **Imperial**	**24.7**	24.2	24.4
2= Durham	**24.7**	24.4	25.6
4 Nottingham	**24.5**	22.5	23.5
5 York	**24.3**	23.6.	24.3
6 Bristol	**24.0**	25.5	25.6
7 Birmingham	**23.3**	23.0	22.2
8 Sheffield	**22.9**	23.3	22.6
9 Southampton	**22.6**	22.1	23.3
10 Manchester	**22.2**	23.7	23.4

The A-level score is calculated thus: grade A = 10 points, B = 8, C = 6. D = 4 and E = 2.

Note: the 'new' universities were not included, but would not have affected the top ten positions. Nor is Cambridge, and this might have come quite high up in the table, but can't be included because it uses a different system. The students of one dept had an average score of only 12; and three London colleges were below 20. Sad, really.

David brings long-range order to inorg chemistry

Among the first papers of 1993 to be published in the prestigious *Journal of the Chemical Society, Chemical Communications* is one from Dr David Goodgame's group at IC in which the first "tyre-tread" molecule is reported. This was made by using a new bidentate ligand in which two pyrrolidone rings are linked through an ethylene-bridge. When MSc student Garry Doyle reacted this with erbium(III) nitrate he obtained polymers in which 54-membered rings had come together to form a chain. Not only that but the rings form a pattern which the authors describe either as "parquet-like" or "tyre-tread" - see below. This remarkable structure was determined by Dr David Williams, the department's X-ray crystallographer.



THE CURIOUS TYRE PATTERN MOLECULE THAT HAS DUMBFOUNDED INORGANIC CHEMISTS.

Also reported in the paper is a similar polymer with chains of 36-membered rings made by PhD postgrad Stuart Hill using a bis-pyridone ligand and manganese(II) nitrate.When interviewed by our reporter, Dr Goodgame was reticent about revealing more about such long-range order in coordination compounds. However when pressed further he mumbled something about "chains, sheets, ropes and boxes" and hurried quickly away.

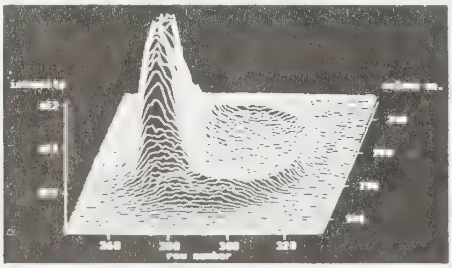
Burly chassis gig moved to June. The fund-raising event for the Bluefields project will now take place this summer. The evening will feature the world-famous IC chemists rock group, Burly Chassis, with lead singer Mick Cappi from Cambridge.

Tickets (£3) from Lisa in the Perkin Lab, Old Building, or ring 4527.

It's Spring, and time once again to think of love . . .

. . .and also to think of the other kind of chemistry, the one that earns this great Empire of ours its bread and butter. Green shoots are everywhere - just look at the Queens Lawn - but those that Norman Lamont and John Major dream about are hard to find. We are still deep in the Recession folks, but it can't last forever and three years from now there could well be a jungle of jobs for well-qualified chemists, and especially those with a PhD from IC.

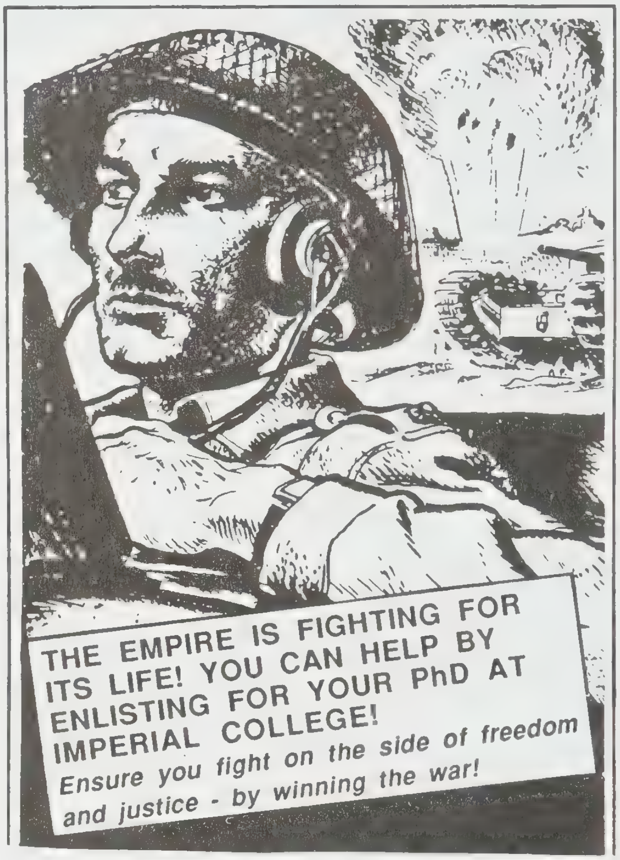
If you are thinking of doing a PhD then you'll thrill to read the long-awaited booklet *Postgraduate Courses and Research in Chemistry 1993-94*, launched last week. Third year undergrads queued before dawn to secure their personal copies. "It's the best careers advice I ever had," gasped one eager reader. Within its attractive gothic cover the booklet lists members of staff and says something about their research. There are exciting lists of key papers to consult for more information. The booklet also gives information about the MSc in Chemical Research, further information of which can be obtained from the Course Director, Professor Michael Spiro.



A DRAMATIC ILLUSTRATION FROM THE NEW *PCRC 93-94* BOOKLET

Those wanting to do research should get a copy of *PCRC 93-94* from the General Office and apply for admission as a research student by completing the application form you get from the Assistant Registrar (Admissions). Fill it in neatly and return it by 1 May.

***CDN job tip:** When you have to complete a job application form, photocopy it blank and make your mistakes on the photocopy. Then when you have filled in the official form photocopy that and keep for future reference.*



AN INSPIRING PROPAGANDA CARTOON

Beat that!

According to the US magazine *Science Watch,* which monitors all scientific papers, the world's most prolific researcher is Thomas Starzl of the Transplant Surgery Unit of Pittsburgh University who published 155 papers in 1991 - that's three papers a week!

The world's most prolific chemists managed only about one a week; they were Virgil Percec of the Dept of Organic and Polymer Chemistry, Case Western Reserve University, Cleveland, Ohio, who published 56, and Allan White of the Dept of Physical and Inorganic Chemistry, University of Western Australia, who published 51. And every one a winner, folks!

Sue Irwin is now compiling a database of all the annual publications of IC members of staff. Several have totals which exceed 10 per year, and a few even exceed 20. The dept's grand total for 1991-2 was a staggering 210.

IF YOU DON'T KNOW WHAT YOU ARE DOING, AT LEAST DO IT NEATLY

CASH FLOOD CONTINUES!

More goodies flow into the department again this month

Alastair gets £40,000 from Defence Research Agency

Visiting Research Fellow, Dr Alastair Gebbie, is hoping to secure a lavish grant of £40,000 from the Defence Research Agency, part of the Ministry of Defence. The funding has been awarded for the study of atmospheric aerosols and the anomalous effects these have on radar waves. Alastair, who retired from the National Physical Laboratory in 1988, came to the dept at the invitation of Professor David Phillips in 1991 and has continued his research interests here. Working with Alastair is post-grad Paul Miller who is also doing his PhD is the area of aerosols in the atmosphere. Speaking to our reporter, Paul said: "We are delighted that the Ministry of Defence is putting money into this field which has key implications in the area of safety and transport."

Garry gets £167,000 to tune his laser . . .

Laser expert, Dr Garry Rumbles, was overjoyed to receive news from the SERC recently that his proposal to carry out research into the luminescence of conjugated polymers is to be funded to the tune of £167,000. The money will support a postdoc fellow, and the lucky recipient will be Dr Ben Crystall, currently working with Head of Department, Professor David Phillips. "This is the biggest grant I have been successful with," a beaming Garry told our reporter, adding: "with Ben's help I hope to investigate the bizarre polymers that chemists are now discovering, some of which have conducting properties and might one day be used to construct 'organic' computers."

Tony gets £45,000 bonus from SERC

Dr Tony Hill has also secured an Earmarked Studentship from the SERC of £6,000 per year plus a consumables allowance of £9,000, making a grand total of £45,000. The funding is for research into the organometallic chemistry of SO_2 and sulfur hetero compounds.

John's third 'win' this year brings in £30,000

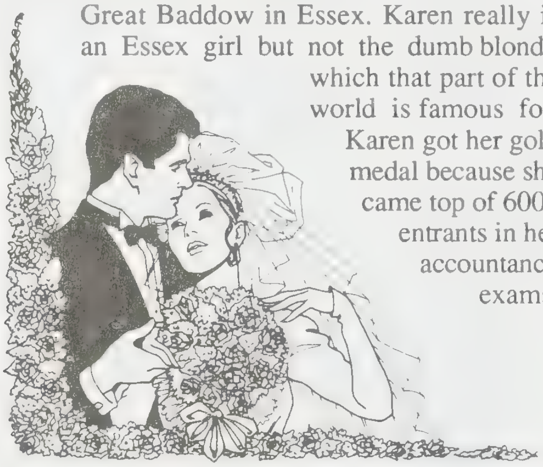
Dr John Seddon was over the moon to discover that his luck has also held out for a third big 'win'. Last month *CDN* announced his two grants shared with Dr Richard Templer which brought them £73,000 from the SERC and £37,000 from the Paul Instrument Fund. This time John gets £30,000 for an Earmarked Studentship jointly with Dr J.C. Dore of the University of Kent, which is somewhere in the sticks south-east of London. "The money is toenable us to carry out a neutron diffraction study of water in silica and lyotropic liquid crystals," John told our reporter, boasting proudly: "and in addition it includes a generous consumables quota."

. . .while David and John get one given!

Psst! Got a spare laser? That was the cry of Head of Department, Professor David Phillips and John Graham, who were desperately seeking an argon ion laser for their research but without much luck. That was until David casually mentioned their problem to Visiting Professor Sir John Cadogan, former research supremo of BP. The very next day Sir John had secured them a £25,000 4W Ar+ laser from BP - *free of charge* and even arranged for it to be delivered to their door!

The Imperial Mole

Something old, something new, something borrowed, something blue. And while he was blue with cold, sniffing around the draughty corridors of the Chemistry Dept at Cambridge last week, the Mole stumbled across a piece of news that warmed his spirits. Remember ex-IC hearthrob **Monty Montgomery?** Well he's getting married to the girl of his dreams, gold medalist **Karen** on 8 May at St Mary's Church, Great Baddow in Essex. Karen really is an Essex girl but not the dumb blonde which that part of the world is famous for. Karen got her gold medal because she came top of 6000 entrants in her accountancy exams.

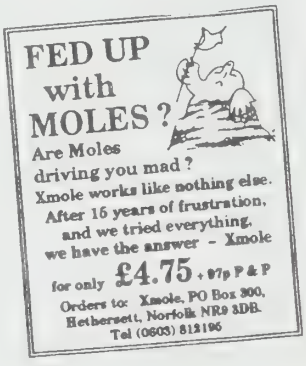


PERFECT HAPPINESS

More about the Mole's fish-and-chip eating friend from Milwaukee, **Alfred Bader**. The other day he took the Mole out to a local bistro and said he wanted to do something to cheer himself up. Little did the Mole realise that Alfred's way of doing this was to buy a castle. Not just any old castle either, but the beautiful historic pile called Herstmonceux, which until recently housed the Royal Observatory. But others had their eye on this wonderful 15th century building, complete with moat. Ex-Bristol academic **Richard Gregory** wanted it for a UK Science Theme Park, and tried to get the Government, via the SERC, to buy it and turn it into a conference centre complete with a hands-on science exploratorium, whatever that is. While the bureaucrats wrote their reports and held their meetings, wily Alfred stepped in with a cash offer and snapped it up. However, Herstmonceux will still end up as an educational institution because Alfred and his wife Isabel really bought it on behalf of Alfred's alma-mater Queens University of Ontario. They gave the university £6m so they could buy the castle and renovate it as their overseas campus. And it's quite near their bungalow in Bexhill.

Undergraduates might be surprised to learn that the Committee of Examiners for IC chemistry, the so-called sub-board, will in future have an arts person among its illustrious number. Media expert **Eric Stables** of the Humanities section will be joining the committee and is believed to have been chosen for his specialist knowledge of Byzantine literature and religious icons of the 14th century. When Eric took the Mole out to lunch the other day he extolled the virtues of IC's Humanities course and how he was impressed by young chemists seeking to become fluent in foreign languages. Eric also revealed he had some chemical know-how and talked a lot about "polyglot". The Mole was puzzled: "Polyglot is important for a modern chemist," he agreed, "but not as important as polyyne, polyions, polyurea and polyimide." After an hour's conversation over lunch they parted, each wondering what the other had been talking about.

Green-fingered **David Bassett** feels threatened by moles - not the chemical kind, we hasten to add - but the kind that burrow away under gardens, etc. The other day David, who is a member of the committee of the Delphinium Society, spotted this advert in the paper he was reading and sent it to the office of *CDN*. Clearly David wants to alert the many other keen gardeners among our readers who may be suffering the same problem. If you are being driven mad by a mole, you can solve the problem with Xmole which sells for £4.75 (plus 97p P&P).



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WHAT YOU NEED MORE OF (MONEY, SEX, TIME) YOU CAN'T GET

When eagle-eyed **Richard Ash** opened last month's *CDN* he was quick to spot our deliberate mistake. In the item on eight nice things to say about Didcot-resident **David Gollins** we mentioned that David had a Bachelor of Arts degree, which is what you get if you study chemistry at Oxford, a small town a few miles south of Birmingham. David then stayed on to do research for his higher degree which we wrongly described as a PhD. In fact Oxford awards the more exclusive-sounding DPhil. Not only that, but the unlucky recipients of this 'honour' have to parade in public, dressed in a blush-red graduation gown. We just thought if were you thinking of going to Oxford to do a DPhil, then you might like to know of the embarrassing fate that awaits you. However be assured: an Oxford DPhil is just as good as an IC PhD. Well almost.

It will come as a surprise to readers of *CDN* that we have in the dept a member of the Campaign for Real Ale (CAMRA) who is also a keen motor-sport enthusiast. The gentleman in question is balding Essex-resident **Phil Cunnington**, our electronics expert. Phil surprised the Mole by revealing that real ale is actually on sale in the Southside bar, where the manager regularly supplies the residents with a selection of brews from all over the country. Phil's favourite is Breakspear's Special Bitter from Henley-on-Thames which he describes as "a strong hoppy bitter". Of course he is teetotal when it comes to his other interest, hill-climbing and sprinting, which finds him travelling all over the UK especially during the Summer. He is a registered contender for the magazine *Car and Car Conversions* speed championships, in which he once came in the top six. "I would really like IC to sponsor me and then I feel I would have the motivation to win the national championship," Phil told the Mole the other day.

IC chemistry is attracting record numbers of well-qualified students, but student numbers have gone up at other depts, including Surrey University at Guildford. You don't believe it? Neither did the Mole until he found himself at The Burford Bridge hotel the other day. From its tithe barn wafted the sound of merriment and who should he find but his old friend, Volvo-owner **Roger Bolton**, staff President of their ChemSoc. It was their annual dinner and 130 fun-loving students all formally attired in evening dress were celebrating. Fair-haired chair person **Ross Cutts**, secretary **Nick Wright**, and perky **Nicki Curtis** their treasurer, pressed the Mole to join the party and smuggled him past the ChemSoc bouncer, hard-man **Dave Elder**. Now that's an official society post which we might do well to copy.

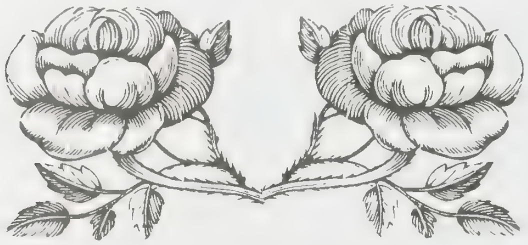
Even so the Mole was confused. Three years ago Surrey chemistry was on the verge of closing. Now it has a larger intake than some London University colleges. What was going on? The Mole learnt the answer from his dinner partners, Rochdale-born father-of-two **Peter Butterworth** and his charming wife **Caroline.** Peter is Pro Vice-Chancellor of the University and an ex-UCL biochemist. "I actually believe in chemistry and keep a paternal eye on the dept," he told an amazed Mole. Not surprising then that Surrey is pulling in the numbers and its ChemSoc is flourishing. Five hours later the Mole was gently weaving his way home round the M25 wondering if it had all been a dream.

Whatever you do when you go to Cambridge, don't talk about MCPBA. That 's the acronym for *meta*-chloroperbenzoic acid, a reagent much used by a certain BP Professor of Organic Chemistry. The Society for Chemical Industry's conference on *Oxidation in Organic Synthesis* produced a curious juxtaposition the other day. *CDN* sponsor **Kevan Reeve**, of Solvay Interox, spoke about the dangers of transporting and using explosive MCPBA, referring to it as a laboratory 'curiosity'. He was immediately followed by his ex-PhD supervisor **Steve Ley** who extolled the virtues of this 'curiosity', which solved many important synthesis problems in his labs. So is MCPBA really as dangerous as Kevan makes out? Probably not, but then why have they put in an order for sandbags at Cambridge?

Bang!

Another IRA bomb shattered the windows of Harrods last month, which might also explain why model enthusiast **Peter Sulsh** was denied entry when he tried to get into that emporium of the upper classes. Although he takes great care to hide his Irish accent, Peter was stopped by one of Harrod's snooty doormen when he drew up on his motor-bike, and tried to visit their toy department to inspect model railway parts. Peter naturally protested, claiming he was 100% British born and bred, with not an ounce of sympathy for the IRA. But to no avail. It is rather strange though, that each time Peter sets out for Harrods he is prevented from getting into the store, either because of a bomb scare, or because one has actually gone off. And who does he think he's kidding when he says he's going there to buy a "00" gauge shunter? However to add credibility to his claim to be an enthusiast, he told the Mole that he was on the look-out for an old Triang E.M.U., whatever that is. If you would like to dispose of one then ring Peter.

Friendly rivalry between Arsenal and Nottingham Forest threatens to split the dept. Or at least to tear apart the year-long friendship between one tall and burly Bishops Stortford lad and a blue-eyed popular secretary from Arnos Grove - both of whom must remain anonymous for modesty's sake. The battle was finally resolved when Arsenal knocked out Notts Forest of the Coca-Cola cup with a resounding 2-0 win on Saturday 13 February. This traumatic event happened just before a long-awaited Valentine's Day party was about to begin. However disappointed the Notts Forest fan seemed to be, he bore the Tee-shirt taunts of his friend with fortitude. But all was forgiven when he later sent her a dozen red roses by special delivery. Now isn't that romantic.



TWO LARGE FLOWERS

ChemSoc Column

Society survives the storms

Following the scandals which rocked the society last month, we are almost back to normal. The programme of talks has resumed, and the next in the series is on 11 March and is:

Drug Discovery Based on Organic Products

by Dr M.J. O'Neil

[Glaxo Group Research Ltd]

The talk is a joint meeting with the Chilterns & Middlesex Section of the Royal Society of Chemistry. There will be a lavish freebie afterwards in the Glaxo common room

Later this session we will also be hosting:

Professor Martin Fleischmann
Cold fusion
Dr M.J. Hughes
Elemental analysis in archaeology

ChemSoc Annual dinner: This long-awaited event will be moved from the Rembrandt Hotel of previous years, if Jason Rutt and Neil Shirtcliffe can find somewhere else. They are currently inspecting The Gloucester and The Forum.

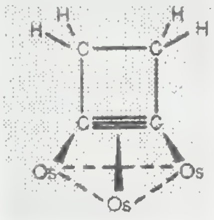
Television: Chemsoc has bought a brand new 25" TV set for the Glaxo common room so that members can follow their favourite soaps, and watch the progress of England's top-ranking cricketers on their wonderful tour of India [some mistake shurely - Ed].

Resources: In the last issue of *CDN* we reported the resignation of the President Esther Coleyshaw and said that £2,500 of sponsorship money had been brought into the society thanks to Esther's efforts. In fact the Society now has £4,500 and is believed to be the best-funded student chemical society in the UK.

Positions vacant: It'll soon be time for us to select new officers for the Society. Interested?

Alan does it again

CDN's ace reporter, inorganic postgrad Alan Bailey, stunned fellow researchers when they opened the lab copy of *New Scientist,* dated 28 Feb, and discovered another news item with his by-line. What surprised them was that the article was about cyclobutyne, which is an *organic* molecule, albeit one which can only exist attached to a cluster of three osmium atoms. Cyclobutyne, as we all know, is theoretically impossible since it requires a 90° angle between the triple bond and the two CH_2 carbons of the ring. Nevertheless as Alan was browsing through the *Journal of the American Chemical Society* (vol 114, page 10,978) he came across a paper by Richard Adams and co-workers at the University of South Carolina reporting the amazing molecule, whose bond lengths and nmr profiles proved it indeed had a triple bond. *New Scientist's* Science Editor, Marcus Chown, praised Alan's report: "As soon as he sent me the item I realised he had come across something good and I rushed it into print."



Science festival frolics

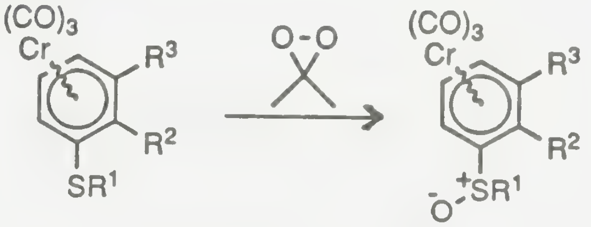
The Edinburgh Science Festival was launched last month with a lavish freebie at the Charing Cross Hotel, where our reporter came across red-haired Sally Goodman who graduated last year from IC's MSc Course in Media Studies. Sally, wearing an attractive black 30s-style hat, told our reporter that she is now working at the British Association, and was with her colleague Sue Lowell who runs the BA's science festival, held each year in August. This year it's at Keele. The Edinburgh Science Festival, which last year attracted 200,000 to their events, will be held next month at a city near Dalkeith. If you are interested in attending then you should ring Marion-Jane Pate on 031-556-6446.
[Head of Department Professor David Phillips is a big supporter of both festivals. He lectured regularly at the Edinburgh Science Festival; and for three years he was Vice President of the BA, with responsibility from their Science Festival.]

Sue's magic tricarbonyls

A special research report by Alan Bailey

In a recent paper about to be submitted for publication, Dr Sue Thomas hopes to astound fellow organic chemists with a report of the synthesis of substituted sulfinyl tricarbonyl(η^6-arene) chromium(0) complexes. In the past there has been much interest in tricarbonyl (η^6-arene) chromium complexes and sulfoxides, particularly in the area of stereochemical control. However no-one, until now, has combined the two areas of interest.

The work was initiated by post-doc Alfonso Pérez-Encabo from Valldolid in Spain, who worked with Sue for 3 months. His work has been followed up by SERC-sponsored postdoc, Stéphane Perrio, from Caen, and 2nd year PhD student Adam Wierzchleyski. The complexes were made by oxidising the sulfenyl derivatives with dimethyldioxirane, a curious peroxide molecule in which both oxygen atoms are attached to the same carbon, forming a three-membered ring.



SUE'S REMARKABLE OXIDATION
OF SULFENYL TO SULFINYL

These complexes are extremely unusual since oxidation of tricarbonyl complexes usually leads to the production of CO_2 but the use of a mild oxidant enables this to happen. The stereochemistry of the oxidation can be controlled by increasing the bulk of the neighbouring substituents. Said Sue: "Because these are novel complexes the field of research is wide open. There is a lot of fundamental chemistry left to do in this area."

The tricarbonyl[η^6-1-(*tert*-butylsulfinyl)-2-methoxybenzene]chromium crystals were analysed by IC's crystallographers, Dr David Williams and Alexandra Slawin.

It's a fact . . .

The world's leading cities for scientific research can be measured by the number of scientific papers that emerge from them each year. The US magazine *Science Watch* analysed the figures for 1991 and the top ten were:

Rank	City	No of papers
1	Moscow	14,500
2	London	14,100
3	Boston	12,500
4	Tokyo	11,600
5	New York	8,600
6	Paris	8,000
7	Los Angeles	6,600
8	Bethesda*	6,200
9	Philadelphia	6,200
10	Osaka	5,400

* Big medical centre in the USA

The near supremacy of London as the world's leading science city is thought to be not unrelated to the fortunes of Imperial College.

IMPERIAL COLLEGE OF SCIENCE, TECHNOLOGY & MEDICINE

ORGANIC CHEMISTRY

Colloquium Programme - Spring Term 1993

March

2 Dr R J K Taylor, University of East Anglia
Adventures in Natural Products Synthesis

9 Mr M B Berry, IC
N-Tosylaziridines in Asymmetric Synthesis
Mr D A Entwistle, IC
What a Load of Ketals
Mr G J Jenkins, IC
Novel Chirons from Biotechnology: What's In It For The Chemist?

16 Professor P D Bailey, Heriot-Watt University
From Peptide Buckets to Synthetic Enzymes

23 Mr M C Clasby, IC
Synthesis via Intramolecular Diels-Alder Chemistry. An Approach to CD-Ring Fragment of Vitamin D_3
Mr S P Marsden, IC
Synthetic Studies on the Immunosuppressant Agent Rapamycin
Mr F Ujjainwalla, IC
Novel Rearrangement Reactions of Aryl and Vinyl Radicals in ipso-Substitution Processes

LECTURE THEATRE D
VISITORS WELCOME

TEA 4.00 P.M
LECTURE 4.15 P.M

Prize Puzzle

Sponsored by Oxford University Press, Britain's leading academic publisher

1st prize is a copy of *The Elements*. 2nd prize is wine, given when there are more than 10 correct entries. 3rd prize is also wine if there are over 20 entries.

Hidden in the square below are elements which can be read vertically, horizontally or diagonally, up or down, left or right. Their initial letters spell the name of a place where there is a wonderful chemistry department.

O	N	C	E	U	P	O	N	A	T	I	M
E	A	F	U	N	N	Y	O	L	D	U	N
I	C	O	R	N	L	O	S	T	I	T	S
W	A	Y	O	H	S	O	D	N	O	W	I
P	E	R	P	L	R	X	I	A	N	A	L
S	I	L	I	C	O	E	N	B	R	O	V
I	O	M	U	I	T	E	T	U	L	X	E
R	E	V	M	S	U	I	D	O	H	R	R
O	N	F	N	O	B	R	A	C	B	S	E
L	M	I	U	N	R	O	F	I	L	A	C
H	E	S	T	P	I	R	U	C	R	E	M
C	L	A	C	I	U	M	U	I	L	O	S

Answers to John Emsley by 20 March.

Last month's winners

The elements in last month's square were silver, helium, europium, francium, fluoride, iron, erbium, lead and dysprosium which together spell Sheffield, a university in Yorkshire with a wonderful chemistry department and glorious views over the windswept moors.

Correct answers were sent in by 23 people: Andy Beeby, V. Fernandez, J.W. Hooper, Tom Smith, Steve Bishop, David Bassett, Simon Lock, Bernard Atkinson, Timothy Alce, Stephen Walker, Zöe Thorn, Richard Dixon, Alison Rowe, Nikki Harwood, Alex Aquino, Amit Bas, James Duckenfield, Yaw-Kai Yan, Valerie Gyselman, M. Hengsakul, Jay Patel, Florence Ajulu (of Sussex) and someone signing himself/herself as The Boss of 549. Over 20 correct answers means three prizes, folks!

The winners were chosen by lot. **Tom Smith** gets the book prize, **Zöe Thorn** and **The Boss** get the wine. Congratulations!

HOLIDAYS, PARTIES, GIFTS AND CARS - ALL COST TWICE AS MUCH AS YOU PLANNED

Organic notebook

Teresa Green moves to a new office and discovers something alarming

Green shoots are everywhere. At the accountancy firm where I work the Bankruptcy Dept has expanded so much in the last couple of years that we have been moved to gleaming Budgie Wharf Tower in Docklands. My section, central admin, has a whole floor and I have a superb office with views over London. How proud I am to be part of the City, which creates the wealth on which we all depend.

I was settling in, and over-seeing a workman putting up my year-planner, when I felt all hot cheeked. He wasn't that good-looking, although his jeans were well rounded. I tried to open a window but they were all sealed, so I turned the air conditioning to cool, and the fragrance control to Alpine breeze. Still it made no difference - in fact I almost started to *flush*.

By the middle of the afternoon I had a headache and felt awful. I switched the air to Carribean Cruise in an effort to regain my equilibrium, but it was no good, so I went home. "You've got sick building syndrome," said Maurice when I told him what had happened. "It's the chemicals from the paint and plastics." Of course! Suddenly it all made sense. In their desperate attempt to cut costs the builders must have used *synthetic* materials instead of *organic* stone, brick and wood.

The following day I put up a notice calling a lunchtime meeting to discuss the toxic cocktail of volatile chemicals our lungs were sucking in. Curiously only a few people came, and those who did said they felt fine, but wanted to know what to do just in case they ever visited a sick building. I felt even more worried that there was something really wrong with me, so I went to see the firm's doctor in his BUPA clinic on the fifth floor. An hour later I knew. But what am I going to say to Maurice? He wants to go on a walking holiday in August.

Alchemy Horoscope

This month's sign is Pisces (20 February to 21 March)

So vulnerable, but so rewarding to know - that's what a piscean friend is all about. Of course if you were born under the sign of the fish you already know what agony you suffer from the slights of others, and how steadfast you try to be towards your friends. Every week seems to bring some new hurt, but also some new joy. By concentrating on small corners of your life and getting things right you gain a certain satisfaction, but often you do this at the expense of wider areas of life where things get beyond your control.

In this respect financial arrangements will dominate the coming months. Pisceans are coming under the influence of mercury, heralding a time of unforeseen changes. You will find yourself getting through the week, and doing all you want to do, with even a few pounds to spare. Suddenly there will be an outflow of cash that no amount of careful budgeting can cope with. Don't be too proud to seek help from others, especially your family. An equally big windfall may then come your way if you take a small gamble. **Ethel Ether**

Fancy that

When drinking water is chlorinated, traces of organic material react to form organochlorines like trichloromethane, $CHCl_3$. Environmental alarmists in the 1980s accused such compounds of causing cancer, even though they were in concentrations of only parts per million. Sadly the Peruvian authorities believed them, and stopped chlorinating water in 1991. Within weeks they had a major outbreak of cholera, a water-borne infection. Over 600,000 people caught the disease and 6,000 died.

In fact marine organisms generate organochlorines quite naturally. The red algae of the oceans are estimated to produce 2 *million* tonnes of CCl_4 and 5 *million* tonnes of $CHCl_3$ annually, far in excess of that produced by the chemicals industry or by the chlorination of public water supplies.

THE INDEPENDENT

SCIENCE is edited by **Tom Wilkie**

Monday 15 February 1993

What lurks within that nasty niff

Methyl mercaptan causes halitosis and smelly socks, but it also has industrial uses, says **John Emsley**

GUIDELINES for acceptable levels of smelly molecules in the air we breathe are to be published next month. At the top of European Odour Standards list will be a molecule we often breathe out: methyl mercaptan (chemical formula CH_3SH), the main cause of bad breath, which we can easily detect when someone speaks to us but not when we produce it ourselves.

In Japan, you can test your breath with a device called the Oral Checker, 10,000 of which have been sold at £60 each. This halitosis detector, the size of a powder compact and patented in 1988 by Katunori Nakamura, works on the principle that a metal oxide, such as that of tin, changes its electrical resistance when it absorbs a gas.

Methyl mercaptan cannot help but have a high profile. Sometimes it is produced naturally from bacteria in the environment: the shore of the Firth of Forth near Edinburgh often exudes it, much to the distress of the residents of the select suburb of Cramond.

When the Pan Britannica Industries plant at Waltham Abbey in Essex, which makes the insecticide dimethoate, accidentally released methyl mercaptan last summer, some local people were so sickened that they sought hospital treatment; others rang British Gas, which is not surprising because similar sulphur compounds are used to odourise natural gas.

Bad breath is caused by several molecules, but the chief culprits are derivatives of sulphur: hydrogen sulphide, dimethyl sulphide and especially methyl mercaptan, which is by far the worst smelling; our noses can detect as little as one part per billion in the air.

Hydrogen sulphide, H_2S, the traditional stink of the chemistry lab, is much less smelly, as is dimethyl sulphide, which forms part of the aroma of fresh coffee.

Professor Graham Embery, of the Dental School of the University of Wales College of Medicine in Cardiff, who is investigating the sulphur-containing molecules in the mouth, says methyl mercaptan arises from the activity of bacteria that are always present.

If the smell of methyl mercaptan is very strong, it indicates gum disease, where deep pockets of the bacteria have released the gas from the amino acids of broken-down protein. Cysteine and methionine, which contain sulphur atoms, are the amino acids responsible; methionine is essential for all living things, and animal protein contains up to 4 per cent of it.

Mr Embery and Professor Gunnar Rolla, of the Dental School of the University of Norway in Oslo, have written a book, *Clinical and Biological Aspects of Dentifrices*, which devotes a whole chapter to halitosis. Mr Embery advises those who suspect they are breathing out methyl mercaptan to use a toothpaste containing anti-plaque agents such as zinc or tin salts. These metals interfere with the enzymes in the bacteria that produce methyl mercaptan. Mouthwashes containing these salts are being tested.

MOLECULE OF THE MONTH

Traditionally, mouthwashes do little more than clean the mouth and disguise the offending smell.

They consist of water and alcohol, with benzoic acid and natural flavours such as thymol and menthol. A good rinse with an ordinary mouthwash will remove about half the oral bacteria, but more can be removed with one that contains an emulsion of oil, say Drs Mel Rosenberg and Ervin Weiss, of Tel Aviv University. They claim that 90 per cent of offending bacteria stick to the oil drops. Another way to clean the mouth is to increase saliva flow by chewing gum.

Our feet can also harbour microbes that give off methyl mercaptan, especially if we provide an environment of unwashed socks and unventilated shoes. Staphylococci and aerobic coryneform bacteria flourish in the increasingly alkaline conditions within unchanged shoes and socks.

A chemical answer is to insert charcoal-filled insoles into our shoes, which absorb the methyl mercaptan between the layers of carbon. Since the amount of methyl mercaptan is tiny, the insoles will work for weeks.

Methyl mercaptan is the simplest member of a series of compounds in which there can be chains of up to 20 carbon atoms attached to sulphur. We encounter mercaptans with three and four carbons when we smell a gas leak. One with 18 carbons is used in silver polishes.

Methyl mercaptan is used in pesticides, especially weedkillers for cereal crops such as wheat, maize and rice, and in the manufacture of methionine, an amino acid that may be deficient in our diet. Some animal feeds are fortified with methionine, thus increasing the amount they offer us in meat and milk.

Although methyl mercaptan is used industrially, a big drawback is its low boiling point of 6C. Luckily it can easily be turned into chemically similar dimethyl disulphide (DMDS), a yellow liquid that boils at 110C. This is only slightly less smelly, but it is much safer to transport around, and is the material imported into Britain.

DMDS is also employed in the making of pesticides, but its chief use is to regenerate the catalysts that become coated with tar when they are used to refine petrol.

Elf Atochem, of Thatcham in Berkshire, the world's largest producer of sulphur-based chemicals, imports DMDS from Rotterdam and Lacq, in south-west France, whose natural gas wells produce large amounts of H_2S.

This is combined with methanol to form methyl mercaptan, which is then converted to DMDS and other mercaptans. Mike Fraser, of Elf Atochem, says the company blends DMDS with other mercaptans to odourise natural gas. "The potency of these simple compounds is illustrated by the small amounts needed," he says. "A wineglass of these liquids is all that is required each day to odourise the gas for a city the size of Southampton."

The author is science writer in residence at the department of chemistry, Imperial College, London.

A romantic couple

Imperial College
CDN
CHEMISTRY DEPARTMENT NEWS

No. 30, April 1993 Editor-in-Chief: David Phillips; Editor: John Emsley

Dept gets go-ahead for three new staff

IC bosses approve appointments to cope with rush of students

Head of Department, Professor David Phillips, was over-the-moon in March when he was told by the Chairman of IC's influential Management Committee, that three chemistry lectureships can be advertised in the coming year. These will be for posts in organic, inorganic and physical chemistry and will bring to seven the new appointments this year. Four recent recruits to the teaching staff have been made under the three-year scheme, and these are: Dr David Baghurst, Dr David Gollins, Dr John Graham and Dr Christopher Parkinson.

Interviewed by *CDN,* Professor Phillips said: "The situation within Chemistry was becoming acute. In September we are losing six of the present staff. Four are retiring (Professor Charles Rees, Professor Lovat Rees, Dr Jim Barrie, and Dr David Bassett), and Dr Willie Motherwell is leaving to take up the chair of organic chemistry at UCL. These three new posts will keep us up to strength."

One of the new appointments has been made possible by Professor Mike Mingos, who has agreed to help by funding half the salary of a technician or secretary from the BP Endowment, as part of the deal. When the new appointments have been made the average age of staff in the department could well be under 40, making it one of the youngest in the country. "Well at least that's a cheerful thought" said one well-known inorganic chemist.

Spring in the air . . .

Happy Easter Folks!

In this issue: full-page report on the Annual Dinner sensation - p.9

Tim goes globe-trotting

Physical chemist, Dr Tim Jones, will be giving talks at three international meetings in the coming term. This month he will be speaking about STM at The American Materials Research Society's annual meeting in San Francisco, then he will be presenting a paper at the Vibrations at Surfaces Meeting (sic) at Genoa in Italy in June, following which he will travel in July to address The Chemical Beam Epitaxy Conference at Osaka, Japan. Speaking to our reporter, Tim admitted: "It seemed an opportune moment to take part in conferences even though it means I miss teaching and exam marking."

Tom's strong arms propel Sir Eric Ash to victory

Among the first year chemists is budding rower Tom Smith who helped to propel the IC team to victory the other week in their boat *The Sir Eric Ash.* On Saturday 13 March, Tom was part of the IC Novice Eight which triumphed over 16 other university crews to win the cup at the Kingston Head-of-the-River Race. Speaking after the event, 6'4" Tom said:"I am proud to be a member of the Rowing Club which I joined when I came to IC last October. Before then I had never rowed at all."

Mass spec supremo

The dept has appointed Jon Barton as our new mass spectroscopist. On 12 April he joins Geoff Tucker in providing the wonderful MS services that the dept is famous for. Dr Derek Woollins, manager of instrument services for the dept, said of the appointment: "We are delighted to secure the services of Jon, who is coming from Sussex University, where he has been working on ion implantation." Before that Jon was three years at Swansea with the SERC MS service. Jon will operate the AutoSpec Q, our state-of-the-art machine built by Vacuum Generators of Manchester. Researchers wishing to use the facility should contact Jon in the basement of the Old Building.

We're really lucky to get Jon, folks, thanks to the remarkable 'efficiency' of IC's wonderful Personnel Office.

Theatre ghost strikes again

Just when we thought that the ghost which has been plaguing the lecture theatres had been exorcised, it has struck again, and this time in a more vicious way than ever. So Bob Armstrong discovered on the 9 March, when he went into theatre E to clean the boards ready for the afternoon lectures. He was staggered to see that a large part of the ceiling at the back of the room had collapsed. "It was really eerie, and there was dust over everything," said a stunned Bob who immediately alerted Chris Sausman that there had been another haunting. Chris rang up the Estates Office. They took one look at the damage and then closed the theatre for the rest of the week. "It was lucky no one was standing below it or they could have been knocked out," a near-to-tears Bob said, who now believes that we may have a poltergeist on the loose in the dept.

BY BELL, BOOK AND CANDLE, EVIL SPIRIT BE GONE!

Cash alert - 1

New? Here's money for you

The Nuffield Foundation runs a Newly Appointed Science Lecturer Scheme which gives up to £4,000 to assist young lecturers. They helped 82 scientists in this way last year. The money can be used for any purpose (except payment of salaries) but you have to apply within 12 months of being appointed. Closing dates for applications are 30 April and 30 November 1993.

Cash alert - 2

'Total relief' guaranteed

The Nuffield Foundation also runs a One Year Science Research Fellowship for 'tired' lecturers. They give out nine such awards each year, and they are meant to provide total relief from teaching and administration for one year, so enabling a young lecturer to concentrate entirely on his or her research. The closing date for these are 1 October 1993 - if you dare apply.

CDN - the only dept newsletter that wards off evil. Always carry a copy!

Alumnus Day looms

IC's Alumnus Day 1993 will take place on Friday 14 May and will be launched with speeches and a lunch in the Sherfield Building, after which old students disperse to wander down memory lane in their respective depts. The chemistry tours will be organised by Dr Bill Griffith and Rosalie Greener, who plan an afternoon of events for visitors in room 231 starting at 2 pm.

"Chemistry is one of the more successful depts in attracting past students back to the dept," said Bill, adding: "The theme this year will be interdisciplinary research." As part of the afternoon, Professor David Phillips will lecture on *Throwing Light on Modern Medicine*. Tea will be provided. If you know of any old students who might like to come tell them to ring the Alumnus Office, 071-225-8658, and ask for the information pack.

Psst! *CDN* has learnt that there are secret plans to turn the 1995 alumnus day into a three day 'junket' to celebrate the 150th anniversary of the founding of the Royal School of Chemistry.

Fourth degree

At the 4 March academic staff meeting, members winced when Head of Dept, Professor David Phillips, formally proposed that they should accept a resolution from the all-powerful Management Committee and approve a 4-year degree course in chemistry. Bemused members endorsed the controversial decision in silence, although they were assured that other depts at IC and in the UK were planning similar courses. If college approves, the course will start in 1996.

The extra year will be used to improve students' abilities at physics and maths, as well as introduce new subjects in chemistry. Those wanting to stay on to do a PhD may have to do the 4-year course as a pre-requisite. Speaking to *CDN*, David said: "The 4-year course will improve the teaching of chemistry and relieve the pressure on present courses." But will this mean more pressure on to the teaching staff? I think we should be told.

David wins a coruscating* £157,000 for his research

Head of Dept, Professor David Phillips, was delighted the other day when he was informed by the SERC that they were willing to fund his research into time-resolved fluorescence imaging to the tune of £157,00. The money has been voted by the Laser Facility and Physical Chemistry Committees and the curiously named Facility Pool Panel, whatever that is. Some of the research will be done in the dept, and some at the Rutherford Labs in Oxfordshire. He also gets some of the award from the Instrument Development Fund.

Interviewed by our reporter, David said: "We are tackling the problem of images which have more than one chromophore in a way that distinguishes the contribution each makes. At the same time we will be able (i) spatially to resolve a microscope image using fibre-optic confocal capability; (ii) spectrally to distinguish different chromophores, and (iii) clearly to resolve emitting species with overlapping fluorescence but different decay times."

* It's the top-people's current buzz word for describing grant applications. It means 'sparkling' folks.

"Dept still in hock" shock

Students and staff were distraught to learn that the dept is still in hock to the tune of almost £1M. They were particularly disappointed that this mars an otherwise record year. We got a 5-star rating from the HEFCE; we had a new chair of organic chemistry funded by Glaxo to the tune of £1M; we were given £3M by the Wolfson foundation to research into medicinal chemistry; we recruited record numbers of students; and staff brought in over £1M in research grants. Somehow we can not free ourselves of debts caused by a previous formula funding system imposed by Sherfield. "What has IC chemistry to do to get our of debt?" said one irate observer.

It's official! IC has Britain's fastest growing chemistry dept!

Right Royal Research

RS showers inorganic staff with cash

Brent's beano

Bystanders in the lift leapt back in amazement when organometallic specialist Dr Brent Young let out a whoop of joy as he read the letter he had just received from the Royal Society. His application for £10,000 for an inert atmosphere glove-box had been successful. Interviewed by our reporter, Brent revealed he will be using it for work on silene polymerizations: "I can't wait to get my arms into those long rubber gloves." The new glove-box will be housed in Brent's lab on floor 5 and will be used for projects such as probing the mechanisms of reactions which lead to precursors for silicon carbide fibres.

Derek's delight

Dr Derek Woollins was over-the-moon when he discovered he had been given £4,500 for consumables for his research into polar cages. The Royal Society rarely gives money for just chemicals but were so impressed with Derek's ideas that they agreed to fund him. But there is one snag: Derek has to carry out all the work himself at the bench. He is planning to do this partly at IC, and partly in collaboration with a group in Germany. "The aim is to fuse all the best elements of electron deficient and electron rich clusters into a large polar supercluster," said Derek.

Tony's triumph

Finally another inorganic researcher, Dr Tony Hill, could hardly believe his luck when he too received a grant for £4,638 for his work on various photochemically-induced cyclo-additions reactions of alkylidyne complexes with multiply-bonded p-block substrates, whatever they are. Tony told our reporter that in his native New Zealand this kind of research could have be done with natural sunlight, which pours in abundance through the gaping ozone hole, but in Britain it requires artificial light sources to supply the necessary photons.

Well done lads! Keep it up!

Pregosin's visit

By David Goodgame

Professor Paul Pregosin visited the dept from 22 to 26 March during which time he met members of staff and gave a seminar on his research. His visit was under the IC/ETH staff interchange scheme, the object of which is to foster closer ties between these two world-leading science-based educational institutions. In his seminar Professor Pregosin talked about applications of modern NMR spectroscopy to problems in coordination and organometallic chemistry. Specifically, he unveiled a new approach to determining the three-dimensional structures of Pd, Pt and Au complexes.

Marks row fury erupts

Third year students came near to rioting when the results of exams they sat at the beginning of this term were only released at the end of it. Speaking to *CDN*, Head of Dept, Professor David Phillips said: "The delay was for 'technical' reasons and teething-troubles with the new scheme." Further investigations by our reporter however revealed that the problem was caused by a question set by someone outside the dept,who had then been unavailable for marking for reasons that are still not clear.

Don't fiddle with the faxes, folks!

It falls to Pauline Yacoubian and Michelle Greaves in the General Office to sort out faxes that come into the dept and put them in the right pigeon holes for people to collect. However someone has been rooting through the faxes which arrive during the evening and at night, with the result that fax headers have been separated from the pages to which they refer. When this happens they may be wrongly pigeon-holed, and can then lay undiscovered for up to a week. Which all rather defeats the point of sending a fax in the first place.

It is proposed to call element 109 meitnerium, chemical symbol Mt. However only one atom has so far been made, so there is not likely to be a mix-up with megatonnes whose symbol is also Mt.

Lecture inspectors: IC date fixed for snoopers visit

Tuesday 16 October is the date agreed for the Government's inspectors to probe the dept's claim that its teaching is 'excellent'. Dr Peter Milton of their Higher Education Quality Assessment Division (HEQAD) spoke with Professor David Phillips and Dr Bryan Levitt, Director of Undergraduate Studies, in March and agreed a protocol for the visit. This will start on the Monday evening when they may meet some of the staff informally. The inspection of undergraduate lectures, tutorials and lab classes will begin on the Tuesday morning and continue to Thursday lunchtime. An oral report will be given to David later that same afternoon.

The investigators' aim is to see all academic staff in action at some point during the inspection and everyone will have to submit a timetable of their duties during the inspection period. The inspectors will also speak to some students, especially those who have done the Year in Industry and Year in Europe courses. They may also talk to some ex-IC postgrads.

CDN's tips to students: if the inspectors ask you about your course then just smile and say something nice and supportive. A selection of useful phrases will be issued nearer the time.

The PimliCOnnection

Student tutoring in local schools

Performance for Pimlico

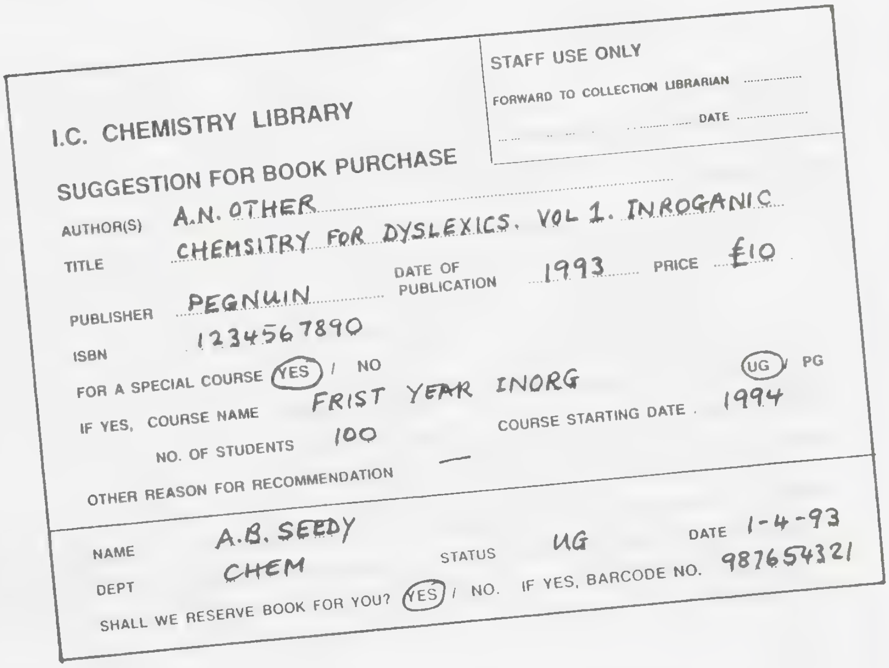
About 20 chemistry undergrads give up their Wednesday afternoons to help teach science to local school children. Among them is second year undergraduate Zoë Thorn who told *CDN* of her time with The Pimlico Connection scheme when it held its annual Open Day on Wednesday 24 March. IC has links with local schools and sends student tutors to help them every Wednesday.

To mark the Open Day the Chemistry Dept put on two lectures, the first by Professor David Phillips called *Flashes and Bangs* with lots of demonstrations, and the second by Dr John Emsley entitled *On Being a Bit Less Green.* Over 200 teenagers came and also visited other depts and IC Radio and the television station, STOIC. "I help at St Clements & St James School in Holland Park. I find it relaxing and rewarding working with the infant science class, trying to project a positive attitude towards science, and it's so nice to meet people who aren't yet cynical," commented a wistful Zoë.

Library alert!

If you want to suggest a book for the dept library, or for the Central Library, you should enter the details on forms like this one ➠➠➠ and hand it in to librarian Sue Irwin. If you have seen the book in an advert or read a review then just hand that in. If you are on-line you can submit your request to Sue by e-mail to: seirwin@ic.ac.uk.

PS: the dept library has on loan until the end of April the Chapman & Hall *Dictionary of Natural Products* on CD-ROM. This can be consulted in Sue's office, where she will show you how it works.



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CDN - the only newsletter that dares to print what we all really think!

The Imperial Mole

Somewhat oddly the Nobel Prize in Chemistry rarely goes to an inorganic chemist, and only three have ever been awarded in the 95 years of its existence: IC's **Sir Geoffrey Wilkinson**, a German **Alfred Werner** (pronounced Verner, folks) in 1913, and 78-year-old **Henry Taube** at Stamford University in the US, who is still going strong. And so is Geoff, the only British Nobel laureate with an active research group in a UK chemistry dept. But what happens when the great man applies to SERC for funding? They don't want to know! *Three* times they have rejected him. Speaking to *CDN* a puzzled Geoff asked: "Are they just short of funds?" but hinted at something sinister: age discrimination! The quality of Geoff's research can't be the reason - his breath-taking discoveries in iridium and manganese chemistry were featured on the front page of last month's *CDN* - so what is going on at SERC? I think we should be told.

The other day the Mole had a visit from debonair **Graham Horne** of Solvay Interox, that booming chemical company that sponsors *CDN*. Sadly he was not brandishing the usual cheque; instead he was full of the joys of California where he had just been on a sun-drenched three week 'working visit'. Graham was at IC to contact Cheshire-born **Katherine Thompson** who is doing her PhD with history-lover **Bill Griffith**. The reason? Some furtive exchanging of rare chemicals that Katherine was providing for Interox to do hazard evaluations on. Preliminary shock-sensitivity tests by Bill had reveal that the compounds were 'safe' - he puts them on the bench and hits them with a hammer. Graham departed with a small package of white powders but hasn't been heard of since. Katherine is now busy making more.

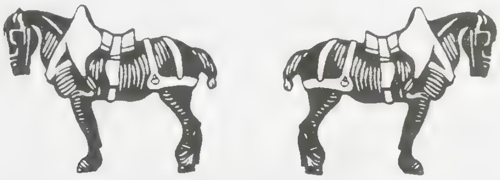
Unlucky 13. That was the warning that vivacious **Mickie Sahrle** ignored when she held her flat-warming party last month on Saturday 13 March. Mickie invited over 50 friends to her new home in Fulham Palace Road, Hammersmith, and most came for what proved to be a memorable evening. However sadly her boss **Tony Barrett** was unable to attend because he was grouting his bathroom. Among those who did turn up was Mickie's new friend 6'3" **Steve** from the local Laundrette, who arrived with a bottle of Scotch whisky which he quietly drank all by himself. This suddenly brought out an unexpected side to Steve, and he had to be persuaded to leave by well-known head-banger **Nigel Male.** There then took place some other events which modesty forbids us mentioning in a family magazine, such as **Donogh O'Mahoney** 'dancing' with a partner from the Barton lab, and the anonymous **Classboy** passing out 'totally happy' on the couch at 2am, where he lay for the rest of the night, awakened the next morning by Mickie's flatmate **Jeff 'Yooper' Kohrt.**

SUPER FAB PARTY

Chemists are boring. Well that seems to be the general idea among those who don't know any, but how's this for a boring chemist: Blonde haired 6'2" **Jason Rutt**, who is also Social Secretary of our ChemSoc, has held the following jobs: a dustman in Hove; a book salesman in Nashville Tennessee; a house-painter in Memphis; a bookies' runner at the Brighton Greyhound track; and a roller-skating waiter in an Indianapolis 50s-style diner. However further enquiries by our reporter revealed that this last job was not quite the success that Jason would have us believe. After only two hours on wheels he was sacked! But the owner of the restaurant took pity on Jason and gave him a job in the kitchens. So how does he find Chemistry at IC? Boring surely when compared to all this. Strangely not so: "None of these jobs prepared me for an evening at the Southside" joked Jason. And he meant it.

Remember folks - you read it first in your soaraway CDN!

The awful things that happen when you visit the sticks! But sometimes you just have to grin and bear it, and this was the fate of some keen young organic chemists from IC. They were from the groups of 31-year-old Yorkshire-born **Don Craig** and UC-loving golf buff **Willie Motherwell**. Our intrepid voyagers had to go to the SERC's offices at Black Hole House, Milky Way Avenue, Swindon, to be interviewed for the highly prestigious and lucrative NATO postdoc fellowships. The IC party consisted of blue-eyed **Martin Clasby** and Bradford-born **Dave Sandham.** As things turned out the interview was the least stressful part of his jaunt in the country for Martin. He was relaxing on the train back to London when disaster struck in the form of an IRA bomb planted at Reading Station. For five boring hours he gazed at the joys of the rolling English countryside while the bomb squad dealt with the device Then it was back to Paddington and the welcoming safety of dear old London.



TWO FARM ANIMALS

The Mole has also visited the sticks recently too. Last month saw him tramping the ploughed fields of Hertfordshire, examining shoots of winter wheat and sniffing the manure used to fertilize them. Bravely he fought through the mud and mire, herded hither and thither in nothing but a minibus. And all in a good cause: soil chemistry. Assorted media folk, including **Rick Stevenson** editor of *Chemistry in Britain,* were visiting Rothamsted experimental station, which is celebrating its 150th anniversary this year, to learn of the excellent work going on there. Father-of-two **Keith Goulding** told us about ^{15}N experiments while Harpenden-resident **Richard Bromilow** talked about the cutting-edge research in the pesticides section, now more tasteful renamed the Biological and Ecological Chemistry Dept.

Over tea afterwards, the Mole discovered some more interesting facts. Did you realise that organic farmers like **Prince Charles** get as much of their fertilizer nitrogen from rain water, as they get from recycling manure? Not only that, but this rain is delivering nitrates and nitrites which come from atmospheric pollutants! Does our future king realise he is living off car exhausts and industrial emissions? Rothamsted also had another surprise for the assembled hacks: they served them with a typical Victorian farmer's lunch. How nice they all said, expecting a Dickensian abundance of viands and ales, only to discover that Victorian farmers were a rather depressed section of the population, they dines on a thin slice of beef, boiled potatoes and some 'salad'.But there was a small raspberry tart for afters. A treat by 1893 standards no doubt - but will Rothamsted repeat this nostalgic banquet when the Queen visits them this summer? We shall watch with interest.

Readers will be thrilled to learn that Sigma-Aldrich will continue its tradition of publishing old masters on the covers of its magazine and catalogues - but it's costing the company thousands of dollars. Previously they used photographs of paintings from the collection of their founder **Alfred Bader**, who made their journal *Aldrichimica Acta* famous for its art, much to the surprise of the outside world who were unsettled to find that chemists could be attracted to a commercial catalogue by such covers. But it paid off handsomely, so much so that even though Sigma-Aldrich ousted Alfred in 1991, they still dare not break with his wonderful ideas. Started in 1965, *Aldrichimica Acta* ran for 83 issues with Alfred freely providing the pictures, and during that time he commissioned many review articles from UK chemists, including a recent one from IC's **Willie Motherwell**. So strong now is the link between Aldrich and fine art that the company has turned in desperation to the St Louis Art Museum to furnish them with photos of their oil paintings. The museum was happy to oblige, in return for a sizeable donation. Will this munificence affect SA's prices? Of course not.

FINE ART

Remember folks - you read it at last in your soaraway CDN!

So whose great idea was it to spruce up block 3 ready for its demolition in a few months time? The dept's photographer, Merton-born **Glyn Millhouse**, who has his studio and dark-room on top of block 2, was intrigued when two large cranes drove up during the last week of March and parked one at each side of block 3. But he rubbed his eyes in disbelief when they raised on high two workmen on safety platforms and they started to washing the windows. These were last believed to have been cleaned when the Queen visited the college to open the New Building about 20 years ago. After a few hours of arduous rubbing and polishing the job was done. Daylight flooded once again into the empty rooms of block 3.

Garry fumes at VAT

The levy of VAT on scientific equipment is penalising research, claims laser expert Dr Garry Rumbles: "It seems daft to make people like me pay this tax from money that is awarded by the Government, and which they claim is devoted to funding research. Of every £1M they allocate they claw back £175,000." Garry quoted an example from his own research. He recently bought some harmonic generator crystals for his laser, and these cost £21,000 plus £1,000 import duty. But on top of this he still had to pay a swingeing £3,675 for VAT. "Surely this tax on research is unnecessary," pleads Garry, and points out that if the tax were removed it would only be putting scientists like himself on a par with those doing medical research who are exempt from VAT."

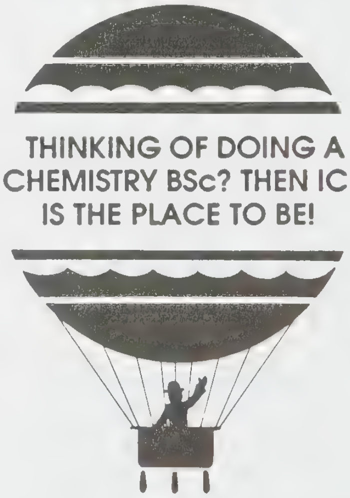
CDN says: It is clearly time to stop imposing VAT on university research equipment, whether for medical use or not. Also the distinction between equipment for teaching (which is VAT-exempt) and that for research (which attracts VAT) is not as clear as the tax people imagine. When the New Universities were called polytechnics they too were exempted from VAT, and maybe they are still are relieved of this burden. Or have they now fallen in line and chosen to pay an extra 17.5% for all their research apparatus? I think we should be told.

All the fun of the Fair Days

For our Admissions Tutor, Dr Margaret Goodgame, this time of year is an endless round of Fair Days, events designed to help young people choose a career, and Margaret will attend no less than 36 days this year. Speaking to our reporter, Margaret admitted: "Fair Days have become an increasing part of the struggle to get good students to IC. I travel all over the country to set up and look after the IC stall."

Last year Margaret gave away thousands of booklets at places as far away as Glasgow and Brussels. Some events are held in school halls but one of the biggest is Careers 2000 held at Birmingham in the massive National Exhibition Centre. It attracts over 30,000 people. Said IC's Director of School Liaison, Professor David Phillips: "Margaret's contribution to recruitment is superb. Indeed she attends over 40% of all IC's Fair Days, and it is mainly thanks to her efforts that we have seen the number of applicants to IC Chemistry increase each year."

Next time you see Margaret leaving the dept at 7 am carrying an IC sports bag, it doesn't mean that she has suddenly taken up squash. She is really carrying the college's wonderful 7' banners that flutter over the IC stand and pull in the crowds. *CDN* was privileged to be given a demonstration of the colourful banners which roll-up with their stands into a space no bigger than a cricket bat. It's magic, folks!



It's a fact: **The number of young people who apply to study chemistry at UK universities falls year-by-year, but at IC is goes up year-by-year. How odd.**

The 1993 FRS scores were: Imperial 0, Cambridge 12. Well done Cambridge!

ChemSoc Column

What a night!

The world-famous ChemSoc dinner finally took place in the luxurious surroundings of the Gloucester Hotel on Tuesday evening 23 March, and was claimed by one participant to be "twice as good as last year." The venue had been carefully chosen by President **Neil Shirtcliffe** and Social Secretary **Jason Rutt**, who were determined that nothing less than the best was good enough for society members.

At 8 pm excited diners sat down to a superb meal consisting of out-of-season melon, followed by a tantalising beef consommé, a main course of roast chicken breast, avec petit pois plus petit pommes de terre, then came a delicious chocolate dessert. And while we listened to some vintage jokes from the guest speaker we sipped vintage port and nibbled exquisite petit fours, with all the coffee we could drink to prepare us for the disco.

Nearly nude

Neil began the speeches with a warm welcome and then produced a slide projector and proceeded to show slides of Head of Dept Professor **David Phillips** taken with a secret camera that caught him either nearly nude or clearly 'happy'. All this was by way of an introduction to David as the main speaker of the evening. David is renowned for his after dinner speeches but on that cold March evening he excelled himself.

Modesty forbids us going into the details of his speech in a family magazine, but he began by recounting an incident from his early years. He was first arrested at the tender age of 14 for being 'happy' and dancing round a local park proclaiming "I am the fairy of the woods!" He then recounted incidents from his time in the US and Russia and told a few of his famous jokes: body-on-the-beach; alligator trapping; bald-headed man; 12" Texan; camel-in-the-dessert; and the Russian worker's hobby. (Send a sae for further details.)

The audience barely had time to wipe away their tears of laughter before Jason stepped forward to present the ChemSoc Annual Awards. The lucky winners of hand-engraved scrolls were:

Peter Gibb and **Andy Patel** were joint winners of the brown nose award.

A new award for the integration of women into science went to hearthrob physical chemistry lecturer **Tim Jones.**

Sean O'Hara won the most unfortunate lab accident award, in which he spilled acid on his nose and then watched it grow to twice its size over the next few days.

Paul Christian got the coveted lithium award for the fastest change of appearance, from orange-haired Mohican to a trim-haired yuppie accountant almost overnight.

Kevin O'Sullivan was given the punctuality award for failing to appear at any 9am lecture - Kevin sadly failed to collect his prize.

The Fosters lager award for alcohol research was deemed a close finish between several contestants and a run-off was staged which may have been won by youthful **Don Craig**.

The speeches were then rounded off with the Science Writer in Residence **John Emsley** thanking all the committee members of the Society who were present for making it such a memorable year:

Neil Shirtcliffe,
Jason Rutt,
Mat Hancock
Rob Cooper
Hardeep Sahota
Rakesh Sharma

and especially **Esther Coleyshaw** who received an especially warm round of applause, a tribute to all she had done for the Society. **Nikki Harwood** was also given special thanks for making the evening such a success by using her persuasive powers to sell scores of tickets. After the speeches ended at 10pm there followed four hours of dancing, during which Nikki also had the honour of doing an old-fashioned waltz with David Phillips.

What a night it was, folks, just hours of innocent IC-style jollity. And why not?

What a society! What an evening! Whatever next!

Chemhistory - no.1

As Henry Ford so succinctly put it: "history is bunk" and he was right. Yet chemistry also has its history, and it isn't all bunk. In future items in this series we will look back at some of the more unusual events. However to start this column let us first take a brief look back over the past 100 years and at the way chemistry affected the lives of people we have known - our parents and their parents and grandparents. What were they doing when they were our age? As you might expect chemistry had a vital role to play in their lives.

100 years ago (1893)
Great great granddad was expanding the Empire while great great grandma was happily filling it with little Brits. Sadly many of these died very young and funerals were a common family event. Everyone had to wear black, and costly silk was the preferred dress material for women in mourning. Chemists made artificial silk (still called art silk) from wood, and this came on to the market in 1893.

75 years ago (1918)
Great grandma was filling shells with nitroglycerine, and had been doing so for four years, while great granddad was busy killing Germans with them. Their chemists retaliated with volatile chlorine compounds. Ours hit back with layers of fused benzene rings. The Empire won that first round on points.

50 years ago (1943)
Grandma filled bombs with TNT, while granddad dropped them on the Germans. They found a way to turn coal into oil, and to make cheap hydrogen peroxide to launch missiles and rockets at us. We discovered polythene and perspex. The Empire won the second round with a knockout, but it was our last big fight.

25 years ago (1968)
Drip-dry shirts for dad and uncrushable dresses for mum. Chemistry had finally brought the high life for everyone. She was liberated by the pill, and he was liberated by purple hearts. Luckily mummy sometimes forgot to take hers, which is why you are reading this.

✺❣✿☞ flower power ✌♥✸❁✳

Chemystery - no.19

Sponsored by Oxford University Press, Britain's no.1.

1st prize is a copy of *The Elements*. 2nd prize is wine, given when there are more than 10 correct entries. 3rd prize is also wine if there are over 20 entries.

Hidden in the square below are elements which can be read vertically, horizontally or diagonally, up or down, left or right. Their initial letters spell the name of a place where there is a wonderful chemistry department.

M	O	N	D	A	Y	M	J	U	L	Y	O
M	A	R	C	H	T	U	E	S	D	A	Y
S	U	N	D	A	Y	L	A	P	R	I	L
A	F	I	A	Y	N	A	N	O	U	A	M
T	R	G	N	C	O	T	S	T	B	U	T
U	I	H	G	I	N	N	H	S	I	G	H
R	D	T	E	Z	E	A	C	P	D	U	U
D	A	Y	T	R	X	T	O	N	I	S	R
A	Y	A	B	E	A	R	S	H	U	T	S
Y	L	I	O	N	U	L	U	N	M	A	D
O	U	T	R	E	A	C	H	L	I	R	A
M	W	E	D	N	E	S	D	A	Y	E	Y

Answers to John Emsley by 25 April.

Last month's winners

The elements in last month's square were lutetium, europium, iron, carbon, erbium, silver, tin, einsteinium and radon which together spell Leicester a university with a wonderful chemistry department. (It's quite near the Watford Gap service area on the M1.)

Correct answers were sent in by 26 people: Jeremy Burnell, Yaw-Kai Yan, Abdul Razak Hashim, Kheng-Wei Yeoh, Howard Stanbury, Khadaffi, Bob 549 the Boss, David Bassett, Steve Bishop, Z.S. Ali, Lloyd Ruddock, M. Hengsakul, Z. Chaudri, J.L. Patel, amit Basu, Miles Ambler, Tim Jones, Nikki Harwood, Alex Aquino, Sam Clark, James Duckenfield, V. Fernandez, S. Lock, Rosemary Parker, Philip Hall and Alison Hindley. The winners were **Kheng-Wei Yeoh** who gets the book prize and **Miles Ambler** and **Alex Aquino** who get bottles of wine. Congratulations!

It's a fact: Imperial College has 6,500 full-time students.

Organic Notebook

Maurice Dancing, Teresa Green and the new fur coat.

When I told Maurice I was expecting his baby he hugged me, kissed me, and rang his mother in Yorkshire. I could hear her shrieks of delight and she insisted on speaking to me, and told me how wonderful I was! That evening over a Quorn curry and a bottle of New Zealand wine we talked about the future and drew up a list of what we would do when the baby was born: Maurice will do the cooking, washing and cleaning, while I will feed the baby and organise a South Hampstead mother-and-baby group.

Maurice was feeling so chuffed with himself that he said he would buy me a present - a fur coat! We had watched *The Clothes Show* and knew that fur was back in fashion. I didn't really object although we had both once been on an anti-fur march from Hampstead to Selfridges. Still times move on and fashions change, and the next weekend we went down Oxford Street. There in the stores were racks of furs again. I tried them on with the help of a young assistant and how delightful they were. Finally I chose a rich brown full-length coat which cost only a modest £400. Maurice flashed his Gold Card.

"What sort of fur is it?" he asked. "Oh its simulated mink," came the reply. Maurice froze, then looked at the label. "It's phoney!" he cried in disbelief: "It's made of some artificial fibre, a chemical!" We backed away. What would it do to our unborn child? I suddenly realised that the lovely smell of fur must also be a sprayed-on chemical too. I nearly fainted.

Maurice insisted on us seeing some *organic* fur, and so we did. "If fur is back in fashion it must mean that they now employ people to go out and collect the pelts of animals that have died from natural causes." The assistant assured us it was so, and told us that furry animals in the wild had an unfortunate habit of dying from heart attacks, especially mink. With that assurance I chose a full-length *organic* mink fur costing £1,750 Maurice signed for it without a murmur. How nice to live in the caring 90s.

Alchemy horoscope

This month sign is Aries (21 March to 20 April)

Arians should always be wary of the moon. They are naturally outward going and keen to live life to the full, but they should take extra care when the moon is in this house of the zodiac. People are talking about you behind your back, and this worries you. Deep down you wonder if they really know your secret. How to keep your love-life out of the limelight is going to be your problem this year. But you are in no danger until you make a rather public show of your emotions, as you may well do, now that the menacing moon is affecting you.

On the financial side you also have a little secret, which again the moon is in danger of revealing. You appear better off than you really are, and someone has the mistaken impression that you can afford to share a rather heavy expense with them. They may even suggest it when you are with your friends and afraid of losing face. Unless you have a quick excuse for saying 'no' you are going to commit yourself to something that will take months to sort out. Be especially alert this month when the moon is full. After that you can relax. **Ethel Ether**

⑦●③○⑧○●⑦❺○④⑥●❶⑤

Fancy that

World demand for ivory, for billiard balls, cutlery handles, piano keys, etc., reached such a demand in the last century that elephants were killed at the rate of 2,000 per week year-after-year for their tusks, which weighed about 25 kg each. Chemists came to their aid with an artificial ivory made from cellulose nitrate and castor oil, and called *parkesite* after its inventor Alexander Parkes in 1862. But some billiard balls exploded, and Parkes went bankrupt. Then John Wesley Hyatt used cellulose nitrate and camphor and called it *celluloid*. This plastic became all the rage and was used to make collars, spectacle frames, combs and even movie film. It was highly inflammable, but at least it saved the elephant from extinction, although it did not stop poaching. The trade in ivory continued until recently, but is now banned by the UN.

It's a fact: the University of Westminster has 7,700 full-time students - but where is it?

MONDAY 22 MARCH 1993 THE INDEPENDENT

JOHN EMSLEY PROFILES A CHEMICAL THAT CAN FEED — OR KILL

Explosive stuff of life

AMMONIUM nitrate explodes in our cities, blights our rivers and contaminates our drinking water. Police said their discovery on 10 March of ammonium nitrate in a north London garage foiled a huge IRA bomb. But without this awesome chemical, the world would be a quieter place because there would be far fewer of us: as a fertiliser, ammonium nitrate provides most of the nitrogen needed to grow our food.

About 75 million tonnes of the chemical are manufactured worldwide each year, and at present there is a glut. Britain makes 1.5 million tonnes, more than 90 per cent of which is used as fertiliser; the rest goes into explosives. Only a tiny amount ends up in terrorist bombs. The IRA's most spectacular nitrate explosion, caused by the chemical packed in a van, wrought destruction in the City of London last year on the scale of a Second World War flying bomb (these too were armed with ammonium nitrate).

In one of the German chemical industry's triumphs at the turn of the century, Fritz Haber (1868-1934) discovered how to turn air into ammonium nitrate, and was awarded the 1918 Nobel Prize for Chemistry. The discovery changed the course of history by undermining the Royal Navy's blockade of Chilean nitrate supplies to Germany.

Haber's process turns nitrogen in the air into ammonia, NH_3, some of which is then converted to nitric acid, HNO_3. Mix ammonia and nitric acid and the result is that you get ammonium nitrate, NH_4NO_3.

Earlier this century some tragic accidents involving ammonium nitrate occurred. On 21 September 1921, a German chemical store at Oppau, containing more than 4,000 tonnes of the stuff, exploded, killing 430 people. Workmen had used dynamite to break up a pile of ammonium nitrate that had become caked solid. And on 15 April 1947, a ship in Texas City harbour caught fire, igniting its 5,000-tonne load of ammonium nitrate, killing 552 people and injuring 3,000. Every building within a mile was demolished.

MOLECULE OF THE MONTH

Today, ammonium nitrate is treated so that it cannot cake solid, and stores are carefully regulated.

Britain can easily make all the ammonium nitrate she needs, but 500,000 tonnes a year is imported from Eastern Europe.

Crops need nitrogen, often scarce in heavily farmed soil. Ammonium nitrate, which can be applied easily, has more than doubled crop yields in the past 20 years.

As fertiliser use has increased, however, so has the nitrate level in rivers and streams, polluting drinking water and encouraging unwanted algae and weeds. But there appears to be little scientific support for the claim by environmentalists that nitrate in drinking water might be a hazard to human health.

Plants absorb nitrogen as ammonium ions that they can use straight away, or as nitrate ions that they reduce to ammonia. Nature supplies nitrogen to the soil through bacteria and microbes, which produce the equivalent of 140 million tonnes of ammonium nitrate a year worldwide. This so-called organic nitrogen, however, is far from sufficient to supply the body-building protein for 5 billion humans, hence the need for inorganic ammonium nitrate.

Crops receive most of their nitrogen from inorganic fertilisers, with manures, soil residues and the atmosphere providing smaller amounts. However, very little nitrate leached from farmland into water supplies comes from inorganic fertilisers; most of it is due to soil residues and manures.

"There is no relationship between ammonium nitrate applied as fertiliser in spring and the nitrate run-off into rivers the following winter," says Dr Keith Goulding, a soil chemist at Rothamsted, the agricultural research station in Hertfordshire, which has been monitoring fertilisers and crop yields for more than 150 years.

Researchers there have used ammonium nitrate tagged with the "heavy" nitrogen isotope N-15 to show that 70 per cent of ammonium nitrate fertiliser ends up in the crop and 15 per cent in soil microbes, while soil bacteria return 10 per cent to the atmosphere as nitrous oxide or nitrogen. Therefore, they say, only about 5 per cent is washed into rivers: much less than the "organic" nitrate leached from the land, although anything that improves fertility will be leached in the long run.

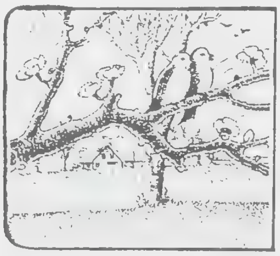
The EC limit for nitrate in drinking water is 50 parts per million (ppm) or 50mg per litre. But to drink water containing twice this amount would not even harm a baby.

Nor do we get nitrate only from drinking water; vegetables contain it (beetroot and spinach have more than 1,000ppm) and we also make about 50mg in our own bodies every day. "The present levels of nitrates in drinking water are perfectly safe," says Dr Goulding, who says the last time a British baby went blue from too much nitrate was in 1972.

Blue-baby syndrome is caused by bacteria in saliva, stomach and intestines, reducing nitrate (NO_3) to nitrite (NO_2). The latter molecule is the cause for concern. Nitrite turns haemoglobin into inactive methaemoglobin, which cannot then pick up oxygen. In the middle years of this century, some mothers used water from wells that contained more than 200ppm of nitrate, and their bottle-fed babies turned blue through lack of oxygen. One or two babies died.

More alarming is the claim that nitrite can react with other components of our food to form the dangerous free radicals called nitrosamines, which are known to trigger cancer. However the incidence of stomach cancer is actually lower in those areas of Britain where nitrate levels in water are above average. One way to neutralise free radicals is to eat foods rich in Vitamin E, a natural free radical scavenger. But be careful about which foods you choose; lettuce, for example, contains not only lots of Vitamin E, but also 1,000ppm of nitrate.

The author is science writer in residence at the Department of Chemistry, Imperial College, London.



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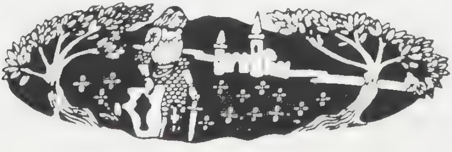
What's going on now at Aldrich Chemicals? They keep changing the name of their famous collection of 35,000 rare chemicals. This was built up with loving care over many years by their former chairman and founder, art connoisseur **Alfred Bader**. After Alfred had been ousted from his company in the night of the long knives, the name of the collection was changed from the Alfred Bader Chemical collection to the ABC collection, and according to company adverts the bottles were relabelled. But did ABC still remind the powers-that-be of their former chairman? Now everything has been changed again , this time to The Sigma-Aldrich Library of Rare Chemicals. Many leading chemists such as Professors **Ralph Raphael** and **Tadeus Reichstein**, who contributed to the library, still know who was the real founder of this invaluable archive. It all reminds the Mole of the famous German poem *Lorelei* which the Nazis could not 'relabel' - so they decreed had been written anonymously. The author was the Jewish poet Heine. *Plus ça change* . . .



A castle

happy. "Perhaps its the relaxation I derive from my new-found passion for the malt!" said Brian, who plans to institute wide-ranging changes in the running of this 'illustrious' dept. Brian is well-known at IC as our inorganic External Examiner, and he has clearly learned a great deal on his visit to the metropolis. He says he is going to try out some of our wonderful schemes in Edinburgh, and in particular our way of assessing students. Over a sixth or seventh malt he confided to the Mole that big changes were

"Say, who the hell's been writing this stuff? It comes perilously close to the truth."

Thanks Hars

ART

And yet more signs of culture at IC by the look of the books they are stocking in the IC Union Bookstore these days. Shelves packed with interesting volumes, and not just recommended texts. There are even some *novels* being stocked! The Mole decided to investigate. There he came across dark-haired **Kathy Choi** who is the store's book buyer. Kathy has been at IC for almost 20 years, is married to **Peter** who works in Physics in the plasma section, and has a 16-year old son **Yemon** who is about to enter the sixth form at Westminster School. Yemon is keen to do science but has to make decisions about which subjects to do next year. He's keen on maths, chemistry, physics and biology, and Kathy said that he hopes maybe one day go to Oxford or Cambridge. But he has to drop one of his science subjects. "Which should it be?" asked Kathy. Naturally the Mole told her.

Poor castle-buyer **Alfred Bader**! Founder and former president of the world's leading research supplier, Sigma-Aldrich, Alfred was ousted in a board-room coup in 1991, and to console himself he went on a spending spree and bought a Rembrandt, a Reuben and Medieval castle. Last month saw him weilding a sword and surrounded by knights in armour at the official opening of Herstmonceux Castle, which is his £6 million gift to his old university, Queens (Kingston, Ontario) who will use it as their European campus. And speaking of Sigma-Aldrich, the Mole came across a neat money-making wheeze of theirs the other day. They are now charging £10 for their *Structure Index*, which they once gave away free. Not only that, but it appears to have become a treasury of errors. It has scores of *wrong* chemical formulae within its pages, including such important ones as that of the female sex steroid estradiol. Whatever will Sigma-Aldrich do next? Perhaps they'll even start charging their customers for chemicals catalogues.

It's always nice to hear from IC's network of friends around the globe, especially when they come across little reminders of *CDN*. And so it was that we received a curious item from our eagle-eyed American readers, dark-haired *Science Watch* editor **David Pendlebury** and his colleague **Chris King**, who describes himself as "boy-friend to the super-models". They sent the Mole a small advert for a Florida establishment calling itself *The Mole Hole* and which claimed to be able to supply 'unique gifts'

The CDN Book of True Facts: **unlike other metals, when molten antimony**

The Imperial Mole

On page 8 you can read all about our Nobel Prizewinner, affable Yorkshire-born **Geoff Wilkinson**. In last month's Mole we told how the great man was repeatedly refused funding by the SERC. This caught the eye of father-of-two **Tom Wilkie**, Science Editor of *The Independent*, and he rang Geoff who told about his research and how it was being threatened. Tom was amazed at Geoff's forthright opinions, duly filed the story, and then crossed his fingers. Now it's a common feature of a journalist's life that the only response you ever get from readers are letters of complaint and abuse, especially if you write a controversial item. If people agree with you they never put pen-to-paper. Not so Geoff, who was so pleased with Tom's article that he wrote a thank-you note. Well Tom thinks that what it was, since in it Geoff simply said that the piece Tom had written was "not bad at all." Translated from Yorkshire into English that means "bloody good".

And speaking of Geoff, another *CDN* story about him got further than we realised. On 29 April we received a fax from **Dr Ian Moss**, Quality Control Manager of Aldrich Chemicals in Dorset. Ian had been contacted by **Dr John Long**, their inorganic specialist in the US. He had been reading the March *CDN* where we reported on Geoff's seminar, in which he said that the iridium chloride he had used was not what it claimed to be. Aldrich clearly wanted to help, and Ian even offered to connect IC to the US office via their internal network. The same day we also received a letter from **Dr Alfred Bader**, who founded Aldrich, and was their chief until ousted in a board-room coup. Alfred still keeps a father's eye on the company he did so much to create, and he too was concerned to know if the afore-mentioned iridium chloride had come from Aldrich. He was clearly relieved when we reassured him that it had not.

Poor 3-year old **Philip Woollins** joined the ranks of the walking wounded recently, while being cared for by the college nursery. To entertain their young charges the nursery took delivery in April of a brand new child-proof climbing frame and set it up for the little darlings to play on. Eager beaver Philip was one of the first to clamber on it, and one of the first to tumble off it, and to the surprise of all he sustained a broken leg. Philip's mum, and dept X-ray crystallographer, **Alex Slawin** was naturally upset by the affair, whereas his father, 6'2" inorganic lecturer **Derek Woollins** took a more laid-back attitude, and was even intrigued by the new type of high-tech polymer composite which had been used to set his son's leg.

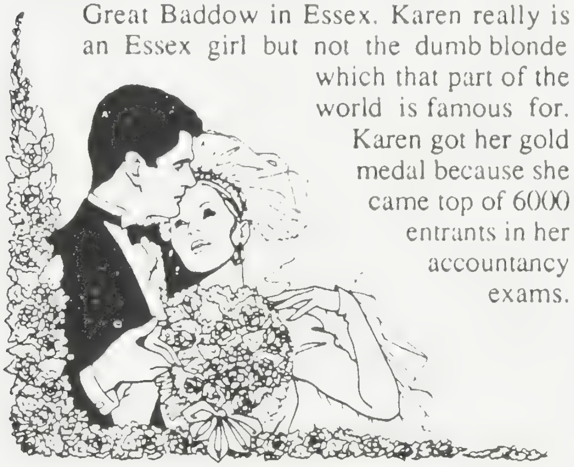
In April the Mole was invited to the Royal Society of Chemistry's Annual Congress by their public affairs officer, Fife-born **Moira Donnelly**. The event was held at the University of Southampton, near Winchester, and the Mole was there to sniff out some news stories. Sadly the chemists of Britain's top depts stayed away in droves, even though their research is publicly funded, so there wasn't much to write about. Which is rather sad as reporters from the leading daily newspapers were there, hoping to discover what wonderful things in chemistry the tax-payers' money is being spent on. Thanks to Moira's good work and lavish hospitality she did have the pleasure of reading reports about the RSC Congress in *The Telegraph*, *The Times* and *The Independent*. And one was even about advances in chemistry.

But you do meet some unexpected people at conferences. One morning at breakfast the Mole found himself next to an ex-IC graduate **Gary Atkins** who is researching CO detectors - see *CDN* backpage. Then at an evening event he met bearded **Alan Shaw** of Fisons. Alan was there for the public lecture "How Does Your Garden Grow?" to which the RSC attracted 300 local people. Afterwards the Mole spoke to Alan who praised his company and mused about their stock-market performance: "Their shares were once £5 each but are now under £2, making them excellent value" he told the Mole who believed him, and thought the tip a good one. Two days later he opened his newspaper to read that Fison's wonder drug for asthma had been dropped. The company shares dropped as well - and by 40p each. Thanks, Alan.

➳➳➳ *Words of Wisdom 4: the majority view is always proved wrong in the end.*

The Imperial Mole

Something old, something new, something borrowed, something blue. And while he was blue with cold, sniffing around the draughty corridors of the Chemistry Dept at Cambridge last week, the Mole stumbled across a piece of news that warmed his spirits. Remember ex-IC hearthrob **Monty Montgomery?** Well he's getting married to the girl of his dreams, gold medalist **Karen** on 8 May at St Mary's Church, Great Baddow in Essex. Karen really is an Essex girl but not the dumb blonde which that part of the world is famous for. Karen got her gold medal because she came top of 6000 entrants in her accountancy exams.

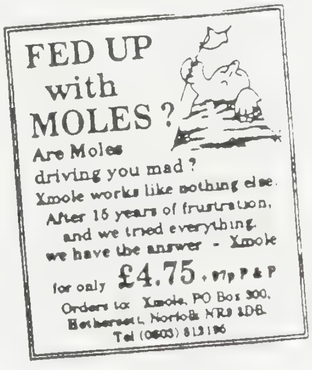


PERFECT HAPPINESS

More about the Mole's fish-and-chip eating friend from Milwaukee, **Alfred Bader**. The other day he took the Mole out to a local bistro and said he wanted to do something to cheer himself up. Little did the Mole realise that Alfred's way of doing this was to buy a castle. Not just any old castle either, but the beautiful historic pile called Herstmonceux, which until recently housed the Royal Observatory. But others had their eye on this wonderful 15th century building, complete with moat. Ex-Bristol academic **Richard Gregory** wanted it for a UK Science Theme Park, and tried to get the Government, via the SERC, to buy it and turn it into a conference centre complete with a hands-on science exploratorium, whatever that is. While the bureaucrats wrote their reports and held their meetings, wily Alfred stepped in with a cash offer and snapped it up. However, Herstmonceux will still end up as an educational institution because Alfred and his wife Isabel really bought it on behalf of Alfred's alma-mater Queens University of Ontario. They gave the university £6m so they could buy the castle and renovate it as their overseas campus. And it's quite near their bungalow in Bexhill.

Undergraduates might be surprised to learn that the Committee of Examiners for IC chemistry, the so-called sub-board, will in future have an arts person among its illustrious number. Media expert **Eric Stables** of the Humanities section will be joining the committee and is believed to have been chosen for his specialist knowledge of Byzantine literature and religious icons of the 14th century. When Eric took the Mole out to lunch the other day he extolled the virtues of IC's Humanities course and how he was impressed by young chemists seeking to become fluent in foreign languages. Eric also revealed he had some chemical know-how and talked a lot about "polyglot". The Mole was puzzled: "Polyglot is important for a modern chemist," he agreed, "but not as important as polyyne, polyions, polyurea and polyimide." After an hour's conversation over lunch they parted, each wondering what the other had been talking about.

Green-fingered **David Bassett** feels threatened by moles - not the chemical kind, we hasten to add - but the kind that burrow away under gardens, etc. The other day David, who is a member of the committee of the Delphinium Society, spotted this advert in the paper he was reading and sent it to the office of *CDN*. Clearly David wants to alert the many other keen gardeners among our readers who may be suffering the same problem. If you are being driven mad by a mole, you can solve the problem with Xmole which sells for £4.75 (plus 97p P&P).



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FAX TRANSMITTAL SHEET

FROM: DR. ALFRED BADER

2961 North Shepard Ave.
Milwaukee, Wisconsin 53211

PHONE: (414) 962-5169

FAX: (414) 962-8322

April 23 92

TO: TO: Dr. John Emsley

FAX: 44 71 589 3869

Dear John

Here are a few letters - of very many.

Tom Cori's favorite sayings.

(1) "I don't trust anyone, why should I trust you?" — My mistake I trusted him!

(2) "There are no friends in business" — I can prove that wrong.

Fond regards

Alfred

6 pages

14 The Fairway
New Barnet
Herts EN5 1HN
Phone 081-449-9964

071 589 5111

Dr & Mrs A. Bader
52 Wickham Avenue
Bexhill-on-Sea
East Sussex TN39 3ER

12 July 1992 17675

Dear Alfred and Isabel,

You can imagine the pleasure we had on reading Thursday's *TheIndependent* and finding what 'a private buyer from Milwaukee' had been doing the previous day. Congratulations! I assume this is the picture that you spoke about when I saw you in May, and now it is yours. I don't known how you both contained yourselves as we sat at dinner and chatted as if nothing particular had happened that day. Anyway it was a very pleasant evening.

I have been thinking about the problem of grants for students from poor backgrounds, and how such people can be identified. Perhaps it would be better to investigate the problem not from the academic side but from the other side. A teacher at Joan's school is the sister of the Director of Education for the London Borought of Brent which has several low income areas. He has said that he would be willing to talk to you about how disadvantaged children wanting to do chemistry at university could be identified and helped. His name and address is:

Mr G.F. Benham
Director of Education, Chesterfield House, 9 Park Lane, Wembley 7HP 7RW.
Phone : 081-900-5440 Fax : 081-900-5443

If the bursaries were lodged with University College but linked with a certain number of deprived areas, it would then be up to the local education authority to identify possible candidates. These would be encouraged to apply to UC and go for a special interview. If they were then acceptable and passed their A-levels they would get one of the £1000-a-year Alfred Bader bursaries.

Please find enclosed the leaflet that I promised you on low chloseterol diets. This comes from the Luton & Dunstable hospital nutrion department where Helen works.

Hoping you are both well,
Kind regards,

John

Dr. ALFRED R. BADER
52 WICKHAM AVENUE
BEXHILL-ON-SEA
EAST SUSSEX TN39 3ER
Telephone: (0424) 222223

My dear John:

1992 was one of the most hectic years of my life: such peaks and valleys. The peaks of course my realization how many good friends I have around the world — and _you_ among my best. And Herstmonceux Castle, the Rembrandt and the Rubens — but my friends are the most important. I just wished that you could have been a little bird and have listened to my discussion with Steven Ley in Cambridge on Tuesday.

Watch for the next Acta: that might give the Imperial Mole some more juicy titbits — its publication is delayed because Co. has forbidden the use of Bader paintings.

All good wishes for 1993,
with love to you and your family.

Alfred

December 19 1992

Dr. Alfred R. Bader
52 Wickham Avenue
Bexhill - on - Sea
East Sussex. TN39 3ER

Tel. 0424 222223

Dr. John Emsley
Imperial College

May 17 92.

Dear John:

I so enjoyed Friday evening, and after the talk reflected on the enormous difference being with good friends - you, Steven Ley, Prudence and Ralph Raphael - and the people I have tried to work with in St. Louis.

When you meet with Tom Cori, you will find him charming and persuasive. He has been hinting to many chemists that I have done something quite terrible which he cannot divulge - and of course you will ask yourself 'could this be true?'. Please, accept my assurance that it isn't - Tom has just decided that this is the only viable method to stonewall questioners.

You may want to ask Steven and Willy to join you, and even Ralph Raphael told me that he would be happy to join you, if you invited him. By all means, share this letter with them, and also the enclosures, which will give you more background information.

The biographical notes were typed last December. The January letter was to Jim Weinberg, senior partner of Goldman Sachs, who did not reply to me.

Two arguments might make some impression on Tom. One is that up to now he has been known as the able son of two Nobel laureates. From now on he will be known as the man who dismissed Bader. The second is that the many hours he spent on the phone talking to chemists about the dismissal, must have suggested to him that he has made a mistake - how can he correct it? I wish I could be a bird, listening in on your conversation - but I fear that he is so arrogant, that nothing - not even the arguments of Britain's ablest chemists - will make an impression.

What I miss the most is the wonderful vehicle I had to help chemists. On any given day at work at home I had between 20 and 50 calls and letters from chemists needing this or that - Cor: pending books on the atomic bomb is no substitute.

I look forward to talking to you again on Thursday and Friday. Kind regards,

from house to house,

Alfred