Welcome to the second edition of ChemNEWS, the newsletter for alumni of the School of Chemistry. There is a lot happening in the School, nearly all of it positive and exciting, and I will only be able to give you the highlights here.

Yet again, the School of Chemistry is the outstanding performer in ARC grants, in both the University of Sydney and the national chemistry arena. Members of the School were awarded more than $3 million in the Discovery program (12 grants), $0.5 million in the Linkage program and nearly $1 million in the Linkage Equipment program. Particularly pleasing is the outstanding success of our younger members of staff. One of the equipment grants will allow us to buy a new X-ray diffractometer that will make the crystallography facility in the School one of the top four in the world and able to deal with extremely small crystals. The other will enable the installation of a new fluorescence detector on the Australian National Beamline at the Photon Factory (synchrotron) in Tsukuba, Japan and is a reflection of the leading role that the University of Sydney and the School are taking in synchrotron science. Research interactions with industry also continue to build rapidly, with Professor Damon Ridley, Associate Professor Greg Warr, and Dr Simone Vonwiller having just signed a contract worth $700 K. This builds on the successes of the Key Centre for Polymer Colloids, the Centre for Heavy Metals Research, and a number of linkage grants in the School.

Numerous changes are occurring amongst the staff: Drs Ron Clarke, Craig Hutton and Meredith Jordan have been promoted to Senior Lecturer. Damon Ridley has been promoted to Professor, an appropriate recognition of his international leadership in the area of Chemical Information Science, an increasingly important aspect of our teaching and research. Professor Peter Lay has taken up an ARC Professorial Fellowship in the School and hence the change in the Headship. We currently have two Lectureships and two Senior Lectureships under advertisement and these have attracted a very strong local and international field of applicants. We are also increasingly attracting top staff with their own funding from other universities – to the extent that the School is bursting at the seams!

Our students continue to be the powerhouse driving the School. As mentioned in an article in the last edition of ChemNews, we attract large numbers of the top students in the State into our talented student programs. This was reflected in the Honours results last year with 5 students winning University Medals and 16 achieving First Class Honours. Furthermore, Nilay Hazari, one of our Honours students from 2002, won a Rhodes Scholarship, the second in three years to go to a student in the School, the other being Annaleise Grummitt who was also awarded the 2002 Convocation Medal. In addition, Prasad Ganesan, another of last year’s Honours students, won the 2002 RACI Masson Memorial Scholarship Prize.

Our first alumni event was judged a great success by the 120 who attended. A celebration of the first chemistry lecture by Professor John Smith took place in the Great Hall with our own Bob Hunter and Dick Collins from Physics giving a highly entertaining lecture. This was followed by a barbecue in the Chemistry courtyard. We are currently planning the next events, but would like you, the alumni, to suggest what it is you would like and if you wish, your help in coordinating the event.

Professor Trevor Hambley
Head of School
Valedictory Musings on 35 Years at USyd

by Don Napper, Professor of Physical Chemistry and Pro-Vice-Chancellor (Sciences & Technology)

As I prepare to leave the University of Sydney, I thought that I might reflect on just how much the University and the School of Chemistry have changed in the 35 years that I have been a member of staff. Many of you will have studied Chemistry during this period, hopefully retaining pleasant, even nostalgic, memories of that time.

The University of Sydney currently provides the most diverse offering of courses of any Australian university and, after Monash University, enrolls the second largest number of students (almost 40,000, some of whom are part-time). In terms of winning ARC Research Grant funding, Sydney University is clearly the leading State university in Australia. The University still regards the on-campus experience of its students in extracurricular activities just as important as its formal teaching program, although sadly many students are now undertaking part-time work which precludes their participation in such activities. Many graduates of my vintage hanker after the sandstone Quadrangle much the same as you would have known. The Chemistry building, however, while now taking on a San Gimignano-like roofline to accommodate upgraded fume hoods, has struggled to provide contemporary physical spaces for teaching and research. These two facts are not unrelated: the University does not receive any additional funding to maintain its heritage buildings; this places enormous strains on its Capital Development budget for upgrading other buildings.

When I returned to the University 35 years ago, the Chemistry building housed three autonomous departments, with the Vice-Chancellor making decisions centrally as to their levels of staffing, funding, etc. Nowadays, as a result of amalgamations and the advent of financial devolution and multi-professorial departments, the School of Chemistry comprises a single academic unit. The School receives a one line budget from the Faculty of Science that is based on its performance. This allocation contains components for teaching (70%), research (20%) and administration (10%). The Head of School has the delegated responsibility for the expenditure of this budget across the entire School.

One significant advantage of this devolved financial system is that decisions are now made strategically by those at the coal face who are most competent to make them. The unification of the School provides greater opportunity for staff collaborations across the various sub-disciplines in both teaching and research, eliminating the departmental barriers that were such a bugbear in the past.

I had the good fortune to return to Sydney University from Bristol as an EIIR Fellow in early 1968. This was a research-only position, at Senior Lecturer level. In those days, research-only positions in science were rare, being introduced by the Government to counter the ‘brain drain’. Nowadays, research-only positions have become fairly commonplace at all levels, mostly funded by the ARC or NH&MRC. Remarkably, the current Government, as a component of its ‘Backing Australia’s Ability’ program, has reintroduced a similar research-only scheme, the Federation Fellowships, to attract back to Australia and retain outstandingly successful Australians, aimed as previously to counteract a perceived ‘brain drain’. The salaries of these Federation Fellows, however, are double the normal Professorial salary and there is an additional annual matching sum to cover research expenses. Of the 25 Fellowships awarded in the first round, 5 have been taken up at Sydney University. I am quietly confident that some of the applicants who wish to work in the School of Chemistry will be successful in the next round.

The core activities of the University of Sydney and its Schools remain much as they have been for the past 50 years: teaching, research and research training, administration and outreach. The level of accountability of universities to Canberra has, however, increased dramatically over the past 35 years and is currently being even further formalised through the Australian Universities Quality Agency. As a fraction (but only a fraction, say one-half) of university funding is derived from the Australian taxpayer, no academic can quibble about reasonable levels

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The Future is Bright ... The Future is Orange!

by Noel Dickson

The University of Sydney has established a Centre for Regional Education at Orange (C.R.E.O.) that will be based at the University of Sydney Orange Campus. At present the Agriculture College (‘Ag’ College) is based there with the Faculty of Rural Management being the main presence on campus.

As part of the CREO initiative, the University called for expressions of interest for involvement in this project and the Faculty of Pharmacy proposed to offer a Bachelor of Pharmacy (Rural). This has now been confirmed and will commence at the beginning of the 2003 Academic Year. Other degrees commencing at Orange at the same time are the Bachelor of Computer Science and Technology and the Bachelor of Liberal Studies. The Pharmacy degree will be fully at the Orange campus over the 4 year degree while the latter two degrees will offer the first year at Orange and then transferral to the Sydney campus.

Within Australia, just like the rest of the world, there is a declining trend for students studying chemistry, both at the secondary and tertiary level. There is one EXCEPTION to this situation and this is found at the University of Sydney. The main reason for this is the excellent outreach programmes that have been developed here, especially by Dr J. Hurst. These programmes include: -

• the High School’s Programme which is aimed at the practical components of the HSC and allows students to visit REAL chemists in a REAL chemistry laboratory and use instruments like an Atomic Absorption Spectrophotometer which is required for their studies. In the 2002 Academic year the School of Chemistry at the University of Sydney catered for some 1,670 students from around 75 schools (quite a number were from rural NSW).

• the Chemistry is Fun series where students come to the University (grade 9 though to 12) and do experiments for fun, like playing with liquid nitrogen and making slime. The students also attend lectures given by members of the chemistry department giving some insights into the REAL world of chemistry.

• the Outreach Programme as such where chemistry is being taken to the schools across the state; it is this involvement and interaction with the students when they are young that helps foster their interest in the subject and their desire to come to the University of Sydney to study chemistry.

• the Olympiad, Science Alliance Club, Chemistry Workshop and the Gifted and Talented Programme are also available and are always over subscribed.

The above programmes have received rave reviews from students and teachers alike. The School of Biological Sciences has a similar although less extensive programme, which is developed along similar lines. The Schools of Chemistry and Biological Sciences intend to establish such an outreach programme at Orange, as well as implementing Bridging Courses and a Summer School to cater for the needs of students in the Orange area and beyond for rural NSW. The country areas have been isolated for too long and having a permanent ‘body’ in place at Orange will be important for the schools and TAFE colleges. It will also provide an important stepping stone for students wanting to attend the University of Sydney.

Collaborations with the Orange City and Bathurst Councils, as well as the Chemistry Department at the main campus, will allow research groups to be developed offering MSc and PhD degrees. For further information please contact Dr Noel Dickson; Phone: +61 2 9351 2731; Fax: +61 2 9351 3329; Email: n.dickson@chem.usyd.edu.au.

Dr Noel Dickson: -
BSc(Hons) from Newcastle University; PhD from Monash under Prof. W.R. Jackson; Presently Lecturer in Chemical Education at the School of Chemistry at Sydney University; taking up new position at Orange Campus of Sydney University in March 2003 with responsibilities for teaching the new Pharmacy (Rural) degree and running the Schools’ outreach programme; taught A-level chemistry in the UK for 10 years where he was progressively Head of Chemistry and then Head of Science at two of the UK’s most successful schools; was involved with a large number of other people in the development of the context based Salters Advanced Chemistry course; was awarded two major teaching prizes: The Salters Chemistry Teacher of the Year (Twice) and a European Teaching Recommendation for Innovative Teaching; returned to the University Sector teaching at Kings’ College London and then York University; Member of the RSC Education division council; returned to Australia in September 2001 and worked in the Green Centre at Monash Univ. until July 2002 when he joined Sydney University.
Jim Eckert writes about

**John Smith’s Photos**

This photo often appears in articles on the history of the University of Sydney. It was taken in the late 1850s, as the Main Building neared completion. On the left, a stonemason is carving a gargoyle in the shape of a giant frog. You could easily miss the real frog, the one he is using as a model, draped over the nose of another gargoyle (circled). John Smith is seen on the right, watch in hand, timing the exposure, while an assistant, off camera, uncaps and caps the lens.

The University had a modest beginning in 1852. The three foundation professors were the only academic staff, in a single Faculty (Arts) and in the first year they taught a total of 24 matriculated students, all male. The Act of 1850 hadn’t banned women but they were not exactly encouraged to enrol for Matriculation. In this matter, John Smith, foundation Professor of Chemistry and Experimental Philosophy (Physics), was well ahead of his time. From the start, he gave public lectures on chemistry which were “open to ladies as well as gentlemen”; and 30 years later he would be prominent in the push to admit women to the University.

Smith’s contributions to the University and the Colony were the subject of fascinating lectures given by Bob Hunter and Richard Collins during last year’s celebrations to mark 150 years since the University’s Inauguration. Born the son of a blacksmith in 1821, Smith was a product of Scotland’s famous classless education system. At the age of 30, he was appointed to the Sydney Chair and, for over 30 years, he contributed professionally to the life of the Colony, especially in the fields of education and water supply. He was, at various times, President of the Council of Education, Chairman of a Royal Commission into the supply of water to Sydney, a Trustee of the Australian Museum, a Member of the Legislative Council and a Director and Chairman of the AMP Society at a time when that organisation’s main concern appears to have been providing social security.

In his spare time, Smith was a pioneer of exceptional skill in the new art and science of photography. Mostly, he used the wet collodion process in which a collodion emulsion carrying the light-sensitive silver salts was spread on a glass plate just before the photo was taken. Exposure times were typically half a minute or more and occasionally someone moved (photo below).

We think of the people at this time as a sombre lot and that is how they usually look in photos. But the slowness of the photographic plates was at least partly to blame. Try holding a smile for 30 seconds.

In the photo above, Smith, again timing the exposure, stands outside the doorway to the Northern Vestibule next to the Great Hall. Carved on the ornate lintel is a Latin motto which reads *Voluntas arcus, facta sagittae* (“The will is the bow, the deeds are the arrows”). Today, the doorway is still in place but not the motto. This was the motto of John Woolley, the University’s first Principal and Classics Professor. It is said to have been chiselled off at the direction of Woolley’s
successor, Charles Badham, when he tired of constantly being asked to translate and explain it.

In 1881, the University Senate approved the admission of women and, the following year, the establishment of three more Faculties (Medicine, Law and Science). Both moves had been fiercely resisted. Arguing against a Science Faculty, Badham conceded that “we shall want cooks, chemists and geologists” and that “some vulgar men decidedly prefer chemistry to Greek”. But, he said, “the curriculum which will best repay the Colony ... belongs more or less directly to the Classical Chair. The object of education is to teach men and women to think”. By then, Smith’s Chair had been renamed the Chair of Experimental Physics and responsibility for Chemistry formally handed over to Archibald Liversidge.

Smith died in 1885 and, in time, even the memory of his photographs was lost. In 1955, however, Professor Le Fèvre came across two plate negatives and several prints during a clean-up of his office in the old Chemistry (now Pharmacy) building. He correctly guessed their origin and gave them to the University Archivist, David Macmillan. Responding to an article about the find in the Sydney Morning Herald, two students contacted Macmillan to say they had seen a box of glass plates in the basement under the stage in the Wallace and many of these turned out to be Smith’s. Most of the plates carried pairs of images, for stereoscopic viewing, and having two versions of each photo made restoration and the production of quality prints a good deal easier.

Without in any way under-estimating Smith’s achievements during a long and active professional life, it is fair to say that he is best remembered today for the photographs. There are 400 glass negatives in the Smith Collection, showing not only stages in the building of Sydney University but everyday scenes as well, of family groups in their homes and on bush and harbourside picnics. These photos are a time machine, taking us back to an Australia of crinoline dresses and stove-pipe hats.

Putting this piece together, I used the following references and took advantage of the accumulated knowledge of Geoff Barker, Curator of the Macleay Museum’s Historic Photographic Collection, who also located the photos I wanted from the University Archives. My thanks to him.

The Year-In-Industry Programme at the University of Sydney

by Tony Masters

In 2003, the School of Chemistry at the University of Sydney celebrates the 30th anniversary of its Year-In-Industry programme. The programme was the brainchild of the late Professor Walter Moore and was one of his first initiatives following his appointment in 1973. Under the programme, students who have completed the second year of chemistry formally discontinue their studies for a year and work in industry. Having completed their year in industry, students return to the University to finish their degree. Many of them go on to Honours, several to a postgraduate degree, many of them enter the workforce with the BSc or BSc (Hons), a few returning to work with their Year-In-Industry employer. Whether they leave the University with a BSc, an Honours, or a postgraduate degree, none of them has any problem getting a job.

The School interviews students in about August and invites suitable students into the programme. We generally invite one or two students more than we have positions. We’re not concerned that they must compete against each other for positions, because this must happen sooner or later and in any case, many employers consider students from several universities. Each student is allocated at least three interviews with different employers (selected on the basis of the information supplied by employers and the students - e.g., is a driver’s licence needed). Each employer is sent about three students for each position they offer. After that, we’re no longer involved in the placements. It’s up to the employers to select students against their own criteria and make whatever arrangements regarding commencement and duration of employment, working conditions, salary, etc as are appropriate and mutually acceptable. Some employers have more than one student in their organisation, sometimes the students are from different universities. Some students work in a single area at a single task or project for the whole year, others are moved around. Some students are offered overtime, others are not. In every respect, we want the position to be a “real” job - neither we, nor the employers, see the employers as a glorified babysitting service.

The programme provides many benefits to the School, the students and the employers. First and foremost, the employers are in a position to teach students something we can’t. Although many students have part-time positions, for many of them this is their first job. For all of them, the regime of full-time employment, the development of interpersonal skills, teamwork, time management, personal discipline, etc. are novel experiences. In addition, after two years at university, they are in a position to start applying the chemistry they’ve been studying. Since about half of our positions are out of Sydney and out of NSW, the attraction of living and working in a different city is important for many students. Others appreciate the break from study, the opportunity to leave home and live elsewhere.

The programme doesn’t suit all employers and some employers aren’t in a position to participate every year. One advantage to all employers is that they get a very clear idea of the calibre of our students. It’s particularly good for those employers who have a continuing position which doesn’t lead anywhere (for a permanent employee) - they get a keen and able student, who is quick to learn, they bring them up to speed, the student does the job well and about the time the student is looking for bigger and better things, the student goes back to university, a new student comes in, etc. It allows them to meet such needs whilst at the same time being seen to provide a community benefit. The timing, remuneration and work practices and environment are those appropriate for each employer. Some students start in December after their exams finish, others might start in February (where, for example, the employer keeps the previous Year-In-Industry student over the summer until they return to university). The main requirement of employers is that they be able to provide a suitable position for approximately a year. As to what positions are suitable, the School takes the view that almost any position which satisfies the objectives of the scheme is suitable, so we have had students employed in manufacturing, research, analysis, regulatory bodies, science communication, etc.

Most importantly, these are very able students, they are the students with the “get up and go” to get up and go. Although not a requirement of the programme, there have been several examples of employers recruiting their former Year-In-Industry students (either full- or part-time) after graduation.

About 10% of our students apply - the number in the programme varies from year to
Thank you!
The School would like to take this opportunity to thank one of its Chemistry alumni, **Dr Frank Donovan**, BSc (1951); MSc (1952); PhD (1955), for alerting us to the recent closure of the Australian branch of Abbott Australasia Pty Limited’s Kurnell site. Thanks to Frank’s initiative the School has now acquired a large quantity of chemicals, free of charge, from Abbott Australasia.

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**Double Congratulations!**

Congratulations to **A/Prof. Margaret Harding** who has been awarded a Vice-Chancellor’s Teaching Award for Postgraduate Research Supervision. This thoroughly deserved award is in recognition for all Margaret’s contributions, at many levels, to Postgraduate supervision. Also our congratulations to **A/Prof. Brendan Kennedy** who was awarded the Gold Medal for 2003 for his research in the area of Neutron Scattering/Materials Science by the Australian Institute of Nuclear Science and Engineering.

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(continued from page 2)

of accountability. There is, however, always a tension between the administration such accountability inevitably imposes and the desire of academics to maximise the time spent on their core activities of teaching and research.

Preliminary data already suggest that the international impact of Australian scientific research, most of which is undertaken by universities, may have declined over the past decade. Some associate this with the reduced time that staff now have to undertake research, as well as a possible impact of performance based funding that rewards the number of publications.

The significant reduction in funding for undergraduate students from Canberra over the past decade has required universities to increase dramatically their numbers of fee-paying students. These are predominantly international students, who now account for some 12% of the total student enrolments at Sydney University. Their presence on the Campus adds an enriching international dimension to the student experience that was mainly absent in the past. Australian universities would be very different financially and structurally in the absence of these students. On the other hand, there are fewer staff who are now required to teach a larger number of Chemistry students than was the case before.

Universities are now placing greater emphasis on the commercialisation of the Intellectual Property that is an outcome of some research projects. The University’s Business Liaison Office has been expanding rapidly to accommodate this growth and has been involved in successful commercialisations in photonics, sensors, anti-cancer agents, bioinformatics and horticulture, to name just a few, some of which have connections with the School of Chemistry.

I had the privilege of working in the School of Chemistry for 29 years and enjoyed every minute of it. I was also appointed its Head on three separate occasions, which shows that chemists are extraordinarily forgiving people. One thing that has not changed in Chemistry is the very high quality of the staff and the teaching and research that they undertake. It would be widely accepted that our School is the most successful in any State university. I can say this because I am in a sense now a ‘defrocked’ chemist, having spent the past 6 years as an academic administrator as Pro-Vice-Chancellor of the College of Sciences & Technology, in which the School of Chemistry is a stellar performer. What most pleases me as I take my leave from the institution is the high quality of the appointments that the School of Chemistry and the College have made at all levels over the past 6 years. This will ensure that Sydney University’s reputation for international excellence in Science and Technology in general and in Chemistry in particular will long continue.
Cornforth Foundation Symposium
A Great Success!

On the 30th September and 1st October over 170 chemists, students and alumni from around Australia gathered for the Cornforth Foundation Symposium. The event was organized to celebrate the establishment of the Cornforth Foundation for Chemistry that honours the life and achievements of former students Professor Sir John Cornforth and his constant collaborator and wife Lady Rita Cornforth. Sir John was awarded the Nobel Prize for Chemistry in 1975 for research on the stereochemistry of enzyme-catalysed reactions. Much more of their story can be found at the Cornforth Foundation web site (http://www.chem.usyd.edu.au/~mcleod_m/cornforth/).

The Symposium was also a key event in the University of Sydney’s Sesquicentenary Celebrations, marking the founding of Australia’s first University. Chemistry has always had a prominent place in the curriculum of the University, with the first lectures in Chemistry being over 150 years ago. This legacy can be traced through the achievements of such chemists as Sir Robert Robinson and the Cornforths through to the present day.

The program for the Symposium featured Prof. K. Barry Sharpless and Prof. Craig Hawker as the inaugural Cornforth Foundation Lecturers. K. Barry Sharpless (pictured above) will be known to all as the winner of the 2001 Nobel Prize for chemistry for his work on chiral catalysis. His lecture, attended by University Chancellor Justice Kim Santow, Senior Deputy Vice-Chancellor Professor Ken Eltis and the Dean of the Faculty of Science Prof. Beryl Hesketh, presented an enlightening and entertaining lecture on “click chemistry”, a powerful approach for the rapid synthesis of complex molecules with novel properties.

Craig Hawker works at the interface of organic chemistry and polymer science in the emerging field of nanotechnology. He presented research from the IBM Laboratory into the development of powerful new computer chips for application, among other things, in the soon to be released GameBoy! They were joined by an excellent line-up of invited speakers and poster presentations that showcased the strength and breadth of chemistry in the Australasian region in areas from transition metal catalysis to biosynthesis, biological chemistry, nanotechnology, macromolecules, electron transfer and natural product synthesis.

I would personally like to thank the generous support of the University of Sydney and everyone who has helped bring this project to fruition – both with the establishment of the Foundation and with the extremely successful Inaugural Cornforth Foundation Symposium. The Foundation will strive to continue the strong tradition of chemistry at Sydney by supporting international collaboration, scholarship and research in the areas of chemistry pioneered and inspired by Sir John and Lady Rita Cornforth. As such, the Foundation provides a lasting benefit to the staff and students at the School of Chemistry, the University of Sydney and the Australian Chemical community at large. I look forward to your involvement in Cornforth Foundation events in the future.

Professor Damon Ridley
Foundation President