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NZIC Chemistry IN NEW ZEALAND

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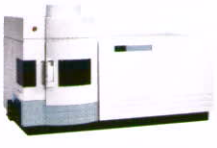

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Chemistry
IN NEW ZEALAND

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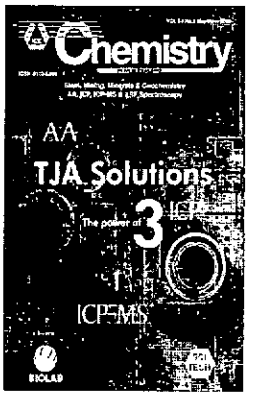

Coming Up ...

July 2000	Clinical Chemistry, Forensics, Toxicology, Centrifuges, Microscopy, Liquid Handling, LC-MS.
September 2000	Polymers, Plastics, Petrochemicals, FTIR, Thermal Analysis, Viscosity, UV Spectroscopy

Deadline for material *5th of the month of publication*

COVER STORY

THE POWER OF 3
WE'VE CONVERGED. AND WE'RE ON A WHOLE NEW WAVELENGTH.

Thermo Jarrell Ash, VG Elemental and Unicam AA - the elemental analysis businesses of the Thermo Optek Group - have come together as a brand-new company. TJA Solutions.

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We'll be consolidating - and incidently, considerably expanding our support team, too. So there will be one number you will call for expert, world-class methods and application help, no matter which technology you're using. Because so many of our instruments are used in mission-critical production and research environments, we're also paying special attention to TJA Solutions new service organisation, and building a single dedicated service group you can count on for 24 hours, 7 days-a-week, 365 days-a-year support. Needless to say, we will continue to support all of our installed systems.

Thermo Jarrell Ash has earned a solid reputation for providing superior analytical performance and innovative designs in ICP optical and mass spectrometers which analyse elemental species in liquids, solids and gases. The instruments serve in a wide cross-section of industries as indispensable tools for production, quality and research.

VG Elemental has been at the forefront of inorganic mass spectrometry (MS), developing innovative products and services to meet the changing needs of the analytical community. VG Elemental has developed a broad range of ICP-MS technologies, icluding quadrupole and magnetic sector systems, cool plasma operation and most recently, advanced Collision Cell Technology (CCT).

Unicam AA has been dedicated to advancing the design, manufacture and support of high-performance flame and furnace AA systems. In addition to improving the analytical capabilities of AA methods, Unicam has pioneered major breakthroughs in reliability, productivity and ease of use of the technology.

For more information on Unicam AA, Thermo Jarrell Ash and VG Elemental products:

Contact: Biolab Scientific Ltd
224 Bush Road, Albany, Auckland
Phone: (09) 9806767, Fax: (09) 9806788
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WORLD CHEMISTRY CONGRESS

The first World Chemistry Congress will be held in Brisbane from July 1-6, 2001. The congress comprises the 38th IUPAC Scientific Congress ("Frontiers in Chemistry") together with the 9th Asian Chemical Congress and AIMECS01, the biannual meetings of the Federation of Asian Chemical Societies and the Asian Federation of Medicinal Chemistry respectively.

The Nobel Laureates Yuan T Lee, Peter Doherty and F Sherwood Rowland have already agreed to present plenary lectures at the IUPAC Congress. The program further comprises five symposia, each of which has subtopics that are pertinent to the interests of the modern chemist who may work in industry, government or academia. These five symposia are (i) Materials Chemistry for the Future; (ii) Chemistry by Computer; (iii) Challenges for Drug Discovery in the 21st Century (joint theme with AIMECS01); (iv) Environmental Chemistry and the Greening of Chemistry; (v) Modern Synthetic Chemistry. Each symposia will include at least twelve keynote lectures by distinguished international scientists plus a wide variety of contributed papers.

The 9th Asian Chemical Congress and AIMECS01 both share some plenary sessions with the IUPAC meeting, and have a number of lectures by distinguished international scientists and contributed papers across the breadth of chemistry. In addition to the themed oral papers, there are opportunities for delegates to present posters at the various conferences.

For further information on the program please refer to the conference web page http://www.ccm.com.au/wcc and register online to receive more information. The second brochure and call for abstracts brochure will be available in July 2000.

There will be an extensive social program, including a welcome reception for all delegates, and individual banquets for each conference. This is a good opportunity to visit Brisbane, to hear about latest cutting edge research and issues in the chemical sciences, to meet with chemistry friends and colleagues, and to enjoy the balmy Queensland winter weather for a short break.

Mary Garson
(on behalf of the Congress Secretariat)

NZ Science Scene

CONCERN FOR FUTURE OF SCIENCE IN POLYTECHNICS

The long-term future of science in polytechnics is causing concern because of the phasing out of pure science programmes at one polytechnic and retrenchment at others.

The Central Institute of Technology (CIT) in Upper Hutt will stop delivering its Diploma in Applied Science programme after this year because of a downturn in science enrolments and the Eastern Institute of Technology in Hawkes Bay broke up its science section last year because of poor numbers enrolling. It seems that many other polytechnics are also struggling to get sufficient enrolments.

Professor Roy Geddes CRSNZ, Dean of Auckland University of Technology's Faculty of Science and Engineering has expressed fears for the future of science in polytechnics with low interest in science and high costs.

He said low science enrolments on many campuses and the low Government funding for the subject meant there was pressure in some areas to drop pre science. Polytechnic science courses in the regions allowed people to staircase to university and the potential loss of programmes would result in isolation and lost opportunities.

CIT Assistant Deputy Principal Dr Peter Osborn said no new students were taken on at CIT this year and the phase-out is likely to result in a surplus of staff in the science area. Dr Osborn said he was not sure what was causing the decline in polytechnic science enrolments but the trend started when the Government began to pull out of training science technicians.

He said that up until the early 1990s, CIT had had good enrolments from trainee technicians for its New Zealand Certificate of Science programmes, but as these numbers had dwindled CIT had turned to offering full-time programmes.

Dr Osborn said that the government science industry had had to downsize over the past decade and demand now appeared not to be for science technicians with certificates or diplomas, but for degree graduates with broad backgrounds who could be trained to meet an employer's requirements.

Professor Geddes said that the Auckland University of Technology had held its enrolments this year but there had been a distinct drift to information technology at the expense of other sciences. Professor Geddes took a delegation of science deans to Parliament in March to express their concerns about low funding levels and low student enrolments, despite the previous and current governments acknowledging the economic importance of science and technology.

The Association of Polytechnics (APNZ) is to call for an extra $500,000 annual grant for the country's polytechnics to prevent more institutions facing financial crisis.

APNZ Executive Director Jim Doyle said most of the struggling small institutions were facing enrolment declines that cut into their income. He said the reasons for the declines differed from region to region but they all suffered the same problems of not being able to react immediately to roll decline.

He said the newly formed Tertiary Education Advisory Commission (TEAC) would be coming up quickly against the issues facing the small regional polytechnics and APNZ would be calling on TEAC to increase the base grant as a short-term remedy for these institutions.

CIT JOBS GO

More than thirty Central Institute of Technology staff in Wellington have lost their jobs and more cuts are likely as it looks at axing or moving courses.

Chief Executive Trevor Boyle said 17 academic staff had been advised on Monday 8 May that their positions were surplus. A larger number of allied staff positions would be affected by the changes though redeployment might be possible. The redundancies follow a review of all departments earlier this year. The institute has suffered in the increasingly competitive Wellington tertiary sector, with student numbers falling from more than 2000 in the mid 1990s to fewer than 1400 this year.

Mr Boyle said it was premature to speculate about future programmes at CIT. However, in a statement to students he said it planned to "focus its future growth in a selected range of programme areas where it already has strength and an established lead".

The lay-offs continue a trend in Wellington, following on from staff cuts at Victoria University and Wellington College of Education as a result of changes in enrolments.

NEW ZEALAND SCIENCE, MATHEMATICS AND TECHNOLOGY TEACHER FELLOWSHIP PROFILES 1998-99

The New Zealand Science, Mathematics and Technology Teacher Fellowship profiles book has just been published and records the activities of the 35 teachers who were awarded a Teacher Fellowship in 1998 or 1999.

Each profile consists of a short biography of the teacher, the specific goals of his/her Fellowship, outcomes and achievements attained, and resources (if any) available from the work.

Compiled from the recipients' own reports, each Host Organisation is acknowledged.

Teachers wishing to apply for a Teacher Fellowship for 2001 should have access to the Profiles book to see the range of activities and research teacher fellows have completed. This will assist them, in consultation with their anticipated host(s), to prepare their proposals. The Profiles book is available to both teachers and possible Host organisations including Regional Councils, CRIs, University departments, City Councils, Science Centres, Training organisations, Trusts, Business enterprises, Government departments, Business Development Boards, and professional bodies.

Copies are available at no cost from the Royal Society:
Phone: (04) 4727421, Fax: (04) 4731841
Email: taranchokov.a@rsnz.govt.nz

Note: Applications for fellowships in 2001 close on 28 July 2000. Guidelines and Conditions for applicants for the 2001 New Zealand Science, Mathematics and Technology Fellowship Scheme and Application Forms are available from the same addresses as above or http://www.rsnz.govt.nz/awards

For further information about Fellowships:
Email: taranchokov.a@rsnz.govt.nz or
Email: spratt.p@rsnz.govt.nz

TEACHER FELLOWSHIP OPPORTUNITIES

A number of organisations are keen to host New Zealand Science, Mathematics and Technology Teacher Fellows next year.

The Royal Society has been approached by the following:

NIWA (National Institute of Water and Atmospheric Research) in Wellington are offering an ideal opportunity for someone who is interested both in further developing his/her skills in providing web-based educational information, and in learning about recent advances in climate and marine science as well as participating in an appropriate climate or marine research project.

NIWA in Hamilton are always keen to discuss ideas with teachers about possible projects, particularly in the marine and coastal sciences.

IGNS (Institute of Geological and Nuclear Sciences) has campuses at Wairakei, Lower Hutt and Christchurch and is keen to host a Teacher Fellow with a project based on earth sciences.

Many regional and district councils are also wanting to act as hosts, especially in the environmental and resource management areas.

If you are interested in pursuing any of these or any other ideas, Email: taranchokov.a@rsnz.govt.nz

ALIENS INVADE BIGFRESH

New Zealand children will soon be able to take a unique tour of BigFresh supermarkets aided by four alien life forms from the planet Zirkel. The four aliens, Mip, Ork, Ur and Lek, are featured on an interactive folding poster, produced by the National Science-Technology Roadshow Trust, which children can fold to explore the science in their local supermarket.

No aisle in the store is left uncharted, from the way deodorants and antiperspirants work on the human body, and why fizzy drinks fizz, through to a fun examination of bar-coding technology with Ur the alien scientist. The poster, supported by the Government of New Zealand through the Science and Technology Promotion Fund and BigFresh supermarkets, is riddled with games and questions, imparting knowledge that might even surprise some adults.

National Science-Technology Roadshow Trust Director, Ian Kennedy, says the Trust cooked up the idea as a means of communicating science to a wider group of people than those who might visit the Roadshow or go to science museums.

"We're trying to reach the people who might not normally think about science and technology and the impact it has on them. Nearly everyone we know goes to the supermarket, so what better avenue to reach people. Now shoppers and their children can go there and appreciate some of the science and technology involved in food, goods, displays and selling.

"I can think of no better reward from this project than hearing some kid say to their parent, 'Hey Mum! Did you know that it's carbon dioxide that makes soft drinks fizzy,' or 'look this alien says that toothpaste has chalk in it and it scrapes dirt off your teeth.' This poster is interesting, busy and colourful and we hope it will also make a good addition to the fridge door," says Mr Kennedy.

BigFresh Marketing Assistant, Jane Goodenough, says that they were pleased to support the poster project and to offer the supermarkets as an outlet. "We've always been impressed with the way in which the Roadshow delivers science education to children. Sponsoring this poster was our opportunity to get on board and support this type of education at the local community level," says Ms Goodenough.

The full-colour, glossy posters will be distributed free to schools and through BigFresh supermarkets.

PEOPLE

Dr Sally Brooker of the Chemistry Department, University of Otago, has recently been awarded a Royal Society of Chemistry Journals Grant to carry out research on pre-organised self-assembling transition metal complexes at

Bristol University with Dr Mike Ward and Professor Jon McCleverty. While there she will also make the most of the opportunity to gain hands-on experience on their SMART X-ray diffractometer, a vital research instrument.

2000 NICHOLAS MULLINS AWARD

The Nicholas Mullins Award is awarded each year by the Society for Social Studies of Science (4S) for an outstanding piece of scholarship by a graduate student in the general field of Science and Technology Studies (STS). The prize, consisting of a cheque of U$500 and a certificate and travel money for the 2000 annual meeting, will be awarded for the tenth time.

The competition is for graduate student papers, which must be submitted in English, based on all types of scholarly products in the field of science and technology studies: unpublished papers, published articles, dissertation chapters. It is recommended that dissertation chapters be adapted so as to make them "stand-alone." The work may not be older than 2 years at the time of submission. The intended readership for the papers is a general STS audience, rather than a specialised disciplinary readership. A graduate student can only make one submission a year.

For information about submitting contributions, please contact the chair of the jury: Vololona Rabeharisoa, Email: rabehari@csi.ensmp.fr

Deadline for submitting contributions is 30 June 2000. Papers received after that date will be considered for next year's contest.

The evaluation is executed blindly by a jury of STS scholars. The winner will be announced at the Banquet of the Annual Meeting of the 4S. Winners are expected to attend the Annual Meeting of the 4S in Vienna, on 27-30 September 2000.

HORTRESEARCH WOMEN'S TRAVEL AWARD

Four women from HortResearch sites around New Zealand have won the chance to further their science careers after receiving a share of a travel award worth $10,000. The annual Margaret Hogg Stec Award is open to all women at 11 sites to undertake further study, training, or to attend conferences.

Ten women applied for the award. The recipients are:

Sarah Hurst, from Palmerston North, who was awarded $5,500 to attend the International Poplar Commission Conference in Oregon and visit the University of Washington to discuss the possibility of doing a collaborative PhD project.

Diane Barraclough, from Mt Albert, Auckland, who received $2,000 towards a trip to Fresno, California, to collaborate with a US Department of Agriculture postharvest group in developing methods identifying flesh and skin browning disorders in stored apples.

Nicola Hall, from Havelock North, who received $2,000 towards a visit to the University of Bologna, Italy, to study rots and resistance of peaches and nectarines.

Bridget Maher, from Te Puke, who received $500 towards her application to attend the NZ Plant Protection Society Conference in Christchurch.

Trish Tapara, HortResearch Training and Development Manager said: "The award recognises that there are still inequities in gender representation in senior and decision-making roles and HortResearch wishes to encourage women in science and support roles to further their careers".

"The award provides the opportunity for women, often in technician roles, who may otherwise not gain funding to travel to overseas conferences and laboratories. This experience is beneficial to their personal career development and to the organisation through establishing networks and collaboration for future science projects".

UNIVERSITIES URGED TO WORK TOGETHER

New Zealand's eight universities must work together if they are to succeed in the future, Associate Minister of Education (Tertiary Education) Hon. Steve Maharey said recently. Mr Maharey was speaking to a seminar on 'New Zealand universities in the new millennium' organised by the Victoria University of Wellington Alumni Association in Wellington.

"New Zealand's universities have an important role to play in developing the knowledge society, but they no longer have monopoly rights. Changes in the tertiary sector and in the world of business mean that our top researchers and scientists are just as likely to work for large companies or in some polytechnics. The challenge for each university is to become innovative and to make a unique contribution. The marketplace model which has dominated for the last decade has encouraged duplication rather than specialisation and the development of expertise".

"The Government recognises that repositioning our universities away from competing with each other and encouraging specialisation will mean that some difficult decisions will need to be taken. All our tertiary institutions have statutory autonomy and the Government does not plan to erode this. However within this framework I am clearly stating our desire to see institutions planning and working together", he said.

STATE URGED TO ADEQUATELY FUND "PEER REVIEW"

The Government is failing to adequately fund a system of scientific checks and balances for state-funded research, some scientists say. Geologist Dr Hamish Campbell, convener of the ERMA seminar on genetic engineering recently, said the amount of "peer review" of public science - scrutiny of scientific research proposals and their results - had diminished in the past eight years.

State-funded science was restructured in 1992, when the then National Government axed the Department of Scientific and Industrial Research (DSIR) and stripped scientists from other government departments to create 10 Crown Research Institutes run on private enterprise lines.

"I'm not saying everything was wonderful about the DSIR . . . but from that moment in time, scientists have had to turn their backs on peer review because they are not funded to do it," Dr Campbell said. "That is serious ... it is a major professional issue." Peer review is a standard practice in the research sector, with many science publications declining to publish the results of research until it has been reviewed by other scientists working in the same field.

Until now, a similar approach has been used by the Government's main agency for investing state money in research, the Foundation for Research, Science and Technology (FRST) for checking the quality of applications for public funding. But some scientists at the weekend conference alleged that was no longer happening, and that scientists who worked for the Government's nine Crown Research Institutes were having their previous funding allocations "rolled over" without having to give a detailed, peer-reviewed description of the proposed research.

FRST group manager of investment operations Dr Colin Webb said some form of checks and balances had been changed in a "transition year".

A blueprint for change announced by the former National Government a year ago required state-funded science to have a bigger emphasis on future technological needs. This had required FRST to renegotiate in just one year a huge proportion of the $300 million annual Public Good Science Fund allocations of public science investment. "It was not possible to call for detailed proposals that would be peer-reviewed," Dr Webb said. Peer reviews could take months, and to be credible often involved scientists overseas.

"We have taken a different approach this year, but we certainly care about scientific and technological merit," Dr Webb said. The blueprint for change included a requirement for science projects to meet standards based on merit. During the transition to a new system, the large science providers who received more than $800,000 a year - Crown Research Institutes, universities, and industry research associations - were having their funding rolled over. This was equivalent to nearly 98 percent of the annual PGSF spending.

Smaller science providers had been given the same opportunities for funding but were allowed to re-focus their programmes. They would come back into an application process in the next couple of years. All science providers had been asked what they were going to do to ensure the quality of the research, where it hadn't been seen by FRST, although long-term projects would have been seen by FRST staff at the start of their funding cycle up to two years ago.

Dr Webb said although scientists were not making specific applications for funding, each institution had had to say what directions their research was heading in, how that was changing from the existing contracts and why, and how that would contribute to the Government's intent.

The Foundation had also asked institutions to give an assurance that the quality of the science being done would be assessed, and some had arranged for people outside their institutions to check that the work done was robust. The Foundation planned to return to auditing science projects next year, but would probably make more use of on-site inspections of work.

NEW CONTAINMENT LABORATORY WILL ENHANCE DIAGNOSIS OF EXOTIC ANIMAL DISEASES

The containment laboratory being commissioned for the Ministry of Agriculture and Forestry's National Centre for Disease in Wallaceville will operate at a level in excess of requirements for a physical containment level 3 laboratory. The laboratory is expected to start operation later this year once commissioning trials demonstrate that the building's biosecurity features are fully operational. The laboratory's physical biosecurity barriers, laboratory techniques and detailed operating procedures will ensure safety and microbiological security to protect both the staff and the environment.

The PC3 Laboratory will provide safe and reliable screening tests for animal diseases. This will reduce New Zealand's reliance on overseas laboratories for exotic disease testing and will speed up finding out whether an exotic animal disease is in the country or not. "Sometimes New Zealand has to wait several weeks before an exotic disease is ruled in or ruled out. This time delay could have huge economic consequences in the event of a real disease outbreak," says Hugh Davies, General Manager of the National Centre for Disease Investigation. "When porcine reproductive respiratory syndrome virus was suspected in a group of pigs in quarantine last year, it took five weeks to get confirmation of our test results from Australia, and another five weeks to get proof of their seronegative status from a laboratory in Holland. If the live organism were held in the new PC3 Laboratory this could be reduced to two weeks," he said.

The laboratory is built in accordance with Australia/New Zealand Laboratory Standards for a Physical Containment level 3 facility but it also has the additional PC level 4 biosecurity features of shower out, a double-ended autoclave to heat sterilise solid waste and systems to decontaminate liquid waste. These biosecurity features are consistent with international standards for laboratories dealing with exotic animal diseases. The Ministry plans to have internal and external audits of the facility and its operating systems by New Zealand and overseas experts.

TERTIARY FUNDS OFFER

The Government has offered tertiary institutions a 2.3% increase in funding if they agree to freeze student fees next

year. Tertiary institutions say the proposal is a "catch-22" situation, however. They say the offer is inadequate but one they cannot easily refuse.

Christchurch Polytechnic Institute of Technology Chief Executive Mr John Scott said the Government has proposed that institutions voluntarily stabilise the level of student fees next year in return for an increased level of funding of about 2.3 per cent on EFTS-funded (Equivalent Full-time Student) programmes.

It is understood institutions have been given about three months to respond to whether the increase will be sufficient for them to stabilise fees in 2001. Tertiary Education Minister Hon. Steve Maharey said this week he could not comment on the proposal because it was part of the budget round.

Mr Scott said the proposed increase was inadequate to meet the real cost of inflation in terms of salary increases and the general expenses of the polytechnic. Smaller regional institutions, and institutions with high debt servicing would be disadvantaged by the proposal, he said.

Universities' Vice Chancellors' Committee executive director Mr Lindsay Taiaroa said institutions had a difficult choice. "If you don't take the money you can put your fees up but you'd have to put them up a lot to make up for the money you didn't get," he said. "When students see that they'll walk away."

Mr Taiaroa said the winners in the proposal were students and the Government, which would fulfil its manifesto commitment. "It has been very carefully thought out by Government as a proposal that's very difficult to refuse," he said. The proposed 2.3% increase is for 2001 fees only, and it is unclear what the Government intends for 2002.

PREDICTED CHANGE IN PUBLIC GOOD SCIENCE FUND?

Science sector sources say they expect the Government to announce a restructuring of the public good science fund (PGSF) in next month's budget. The fund provides $300 million a year in state funding for scientists.

Ministry of Research Science and Technology (MoRST) Chief Executive Dr James Buwalda when asked whether the PGSF would still be in its present form later in the year, said there would be changes in the structure of the Government's "output classes". "There will be a range of output classes that cover the scope of the PGSF," he said. There would be "horses for courses" and better recognition of different sectors such as social, environmental and economically focused work.

Dr Marie Bradley, a programme manager for the Foundation for Research Science and Technology (FRST), declined to answer questions from the audience at the ERMA seminar in Wellington on genetic engineering recently when she was asked whether the PGSF was to be split up. She later told NZPA that she could not comment

because the issue was the responsibility of MoRST while FRST only distributed the money. Her questioner, Dr Janet Grieve, President of the NZ Association of Scientists, said afterwards that she believed the "public good" element of state science spending was being eroded.

The initial concept of public funding being used for research where the benefits could not be captured by a private investor, but would still contribute to the nation, had been slipping over the past eight years. "It's now almost open slather, to a worrying degree," she said. She said it looked as though the PGSF could be split, so research which was more for the public good than the benefit of a private company, such as some environmental work, was separate from research spending for economic growth. This would allow public good research to be judged on its excellence, rather than whether or not it was "innovating" a new product. FRST group manager of investment Dr Colin Webb said the former National Government's "blueprint for change" had turned state-funded science to a bigger focus on future technological needs. The former government set aside $11 million in new funding for the New Economy Research Fund (NERF), and also earmarked $25 million of the PGSF money to be transferred into the project.

The NERF scheme is aimed at bridging the gap between the $23 million Marsden Fun (basic, curiosity-driven research) administered by the Royal Society of New Zealand, and the PGSF. Until now FRST has mostly given out state science funding on a merit basis, according to "bids" by science providers such as the nation's nine Crown Research Institutes, universities and industry research associations, such as the Dairy Research Institute. In future it is expected to "invest" money on a portfolio basis - in big chunks of $4 million or $5 million at a time - as sectors develop their own science strategies for what research they should be doing and how much funding is needed.

MoRST economic policy officer Dr Julian Williams said the main thrust was to enable the state science spending to be better focused on the blueprint's strategy of innovation, economic, social and environmental goals.

ROYAL SOCIETY COUNCIL ELECTIONS

The Returning Officer and scrutineers for the Royal Society of New Zealand Council Elections report that, as a result of a 60% response from the eligible voting membership, the following were elected to the Council. The following candidates were successful in a contested ballot (*denotes sitting member):

Earth Sciences & Technologies - *Dr Jim Salinger MRSNZ, National Institute of Water & Atmospheric Research, Auckland

Physical Sciences & Technologies - *Dr Neil Milestone MRSNZ, Industrial Research Limited, Lower Hutt

Primary Industry Sciences & Technologies - Professor Jacqueline Rowarth MRSNZ, currently Lincoln University but appointment pending at UNITEC, Auckland

Social Sciences - Rosemary Du Plessis MRSNZ, University of Canterbury, Christchurch

Regional Constituent Organisations - Dr Sally Hasell MRSNZ, Australia New Zealand Food Authority (ANZFA), Wellington

The following were elected unopposed (*denotes sitting member):

Biological Sciences & Technologies - *Dr Ian Boothroyd MRSNZ, National Institute of Water & Atmospheric Research, Hamilton

Health Sciences & Technologies - Dr Geoffrey Savage MRSNZ, Lincoln University, Canterbury

Mathematical & Information Sciences & Technologies - *Professor Jeffrey Hunter MRSNZ, Massey University - Albany Campus, Auckland

Science & Technology Education - *Robyn Baker MRSNZ, Wellington College of Education

Technological & Engineering Sciences - Sir Ron Carter MRSNZ, Beca Group Limited, Auckland

The Academy Council of the Royal Society has notified the Chief Executive Officer that its appointees on the Society Council are:

Professor George Petersen ONZM FRSNZ, University of Otago; Professor Paul Callaghan FRSNZ, Massey University; Professor David Elms FRSNZ, University of Canterbury

The incoming Council is entitled to make up to three appointments to Council for reasons prescribed in the Act.

Professor George Petersen has been acting as President of the Society following the retirement of Sir John Scott as President on 31 March 2000. The Society President is elected by the incoming Council.

GOVERNMENT TO PLACE MORATORIUM ON FURTHER UNIVERSITIES

The Government has introduced legislation limiting the number of universities to eight, the Associate Education Minister (Tertiary Education), Hon. Steve Maharey announced this week.

Mr Maharey said that it is Government policy not to increase the number of universities beyond the present eight institutions. The Government has established a Tertiary Education Advisory Commission (TEAC) to give it advice on the structure of New Zealand's tertiary education system and the bill will prevent further universities being created while the Commission goes about its work.

"New Zealand is a small country. We need to make the best use of our resources to ensure that the appropriate

mix of quality tertiary education and skills training is available throughout the country. The Government wants to build a coherent tertiary education system where each institution is encouraged to play to its strengths according to an agreed nationwide plan. I have already established a Tertiary Education Advisory Commission to give us advice on the strategic direction our tertiary sector should be moving in and how the various players can make this happen. In the context of the Commission's work we do not believe it would be sensible to create further universities until this advice has been received. If this Bill is passed all current applications for university status will be placed on hold. The Bill will be referred to the Education and Science Select Committee with a report back date of 19 June 2000 and once passed will take effect from the date of introduction", Steve Maharey said.

EX-STUDENT'S FAMILY DONATES INSTRUMENT TO THE UNIVERSITY OF AUCKLAND

The Department of Chemistry at the University of Auckland was pleased to welcome Susan Johnson and her three children Holly (12), Christy (11) and Mark (8) on Thursday 27 April 2000. Susan and her family were visiting from the USA and were pleased to see that the PerkinElmer Spectrum One FTIR Spectrometer that they donated to the organic chemistry section was being well used by the research students. The Johnson family donated the FTIR to the organic chemistry section in memory of Steven Johnson (late husband of Susan and father of Holly, Christy and Mark) who was a PhD student in the Department from 1979-1983 and had a passion for organic synthesis. The University of Auckland was the first site in New Zealand to install the newly released Spectrum One FTIR.

Above: (from left) Holly, Christy, Susan and Mark Johnson observe the PerkinElmer FTIR they donated to the Chemistry Department at the University of Auckland.

MASSEY CHANCELLOR CALLS FOR TAX INCENTIVES TO BOOST RESEARCH FUNDING

Tax incentives should be introduced to encourage companies to fund university research, Massey University Chancellor Morva Croxson said recently.

Speaking at a graduation ceremony, Mrs Croxson criticised New Zealand companies for not giving enough money to research. Universities often had difficulty reaching research goals because of a lack of money, and scientists were often diverted from their work to seek funding. .

New Zealand companies gave less to university research than Australian and Swedish companies, Mrs Croxson said. "Tax incentives encourage the companies to give, and we could do with them."

Scientists had become frustrated with the lack of funding, leading to a brain drain of university staff and graduates to industry, commerce, overseas and "lucrative business placements", Mrs Croxson said.

"THE ART OF SCIENCE AND THE SCIENCE OF ART"

Lecture by John Nicholson hosted by Victoria University of Wellington in association with the Royal Society of New Zealand.

6.30 pm - 8 pm, Monday 24 July Lecture Theatre 103, Maclaurin Building, Victoria University of Wellington - Kelburn. Fee: $20, Course 00255.

Art: A Catalyst for Chemistry For thousands of years, and for a variety of reasons, people have felt impelled to paint. The cave painters of the world were arguably proto-chemists, extracting and using materials from their environment in the pursuit of art. Explore the historical development of these materials and learn how the demands of artists influenced the evolution of science.

Science: A Stimulus for Art. The physical sciences matured in the 19th century, establishing a theoretical foundation for the analysis of materials and the synthesis of new ones - including pigments. A combination of chance and commercial opportunism has produced brilliant colours for contemporary art and at the same time the opportunity to examine and restore old masters to their former glory.

John Nicholson is Manager of the Science Starter Programme at the Centre for Continuing Education, University of East Anglia, England.

BIOLOGICAL METHODS OF PROSPECTING FOR MINERALS

Robert R Brooks, Department of Soil Science, Massey University
Private Bag 11222, Palmerston North

Introduction

It is probably true to say that the past decade has witnessed the coming of age of biological methods of prospecting. It no longer seems absurd that scientists should analyse biological materials for mineral prospecting, or should enlist the help of dogs, ants, or even humble microbes as field assistants for this purpose. The variety of biological samples used for mineral exploration is really quite astonishing and ranges from leaves of plants to even the "final product," animal faeces.

A clear distinction must be made between the various sub-disciplines of biological methods of prospecting. These include: geobotany, biogeochemistry, geozoology, and geomicrobiology.

Why do we need biological methods of mineral exploration? This is the question that inevitably arises when the subject is discussed. To answer it, we must realise that most of the world's easily discoverable mineral deposits have already been revealed and that those remaining are probably below the sea or in inaccessible parts of the globe, perhaps at depth, or perhaps covered by ice. To maintain reserves of economic minerals, either more deposits have to be found, or previously uneconomic ores have to be exploited. Most mineral deposits that are discovered today are smaller than earlier finds, and have become increasingly difficult to uncover. Exploration geochemists now have a wide array of methods at their disposal for finding these ever-more-elusive targets. These include chemical analysis of rocks, soils, waters, airborne particulates, stream sediments, bogs, and of course, vegetation. Each of the subdivisions of biological methods of exploration will now be discussed.

Geobotanical Exploration

Georgius Agricol (Georg Bauer) was a mediaeval metallurgist and miner in his famous book *De Re Metallica*, we read (Agricola, 1556): "*...over concealed ore bodies the soil will produce only small and pale-coloured plants...in a place where there is a multitude of trees, if a long row of them at an unusual time lose their verdure and become black and discoloured and frequently fall by the violence of the wind, beneath this spot there is a vein.*"

Agricola was one of the first to recognise that plants growing over mineralisation can have a different species composition and morphology that those growing over non-mineralised substrates. A few years later Thalius (1588) observed the presence of the mineral indicator plant *Minuartia verna* that was an invariable coloniser of lead/zinc mineralisation in The Harz region of Germany. In Scandinavia, the mediaeval copper miners were guided to their target by *Viscaria (Lychnis) alpina* and there are many other mediaeval references to geobotanical prospecting.

In more recent times, extensive geobotanical prospecting was carried out in the 1950s in Zambia using the famous "copper flower" *Becium homblei* that is not found in soils containing <100 µg/g (ppm) copper. In the present decade, plant mapping *per se* as a means of prospecting is not used extensively but has been superseded by remote sensing of vegetation using satellite imagery. Modern satellites such as the French SPOT series have a resolution as good as 20 m and can be used to map different plant communities from the air and to identify plant communities that might be associated with mineralisation. Brooks *et al.* (1995) have given an extensive review of the subject of geobotany in mineral exploration and have shown the geographical distribution of studies reported in the world literature as is shown below in Table 1.

Table 1. *Geographical distribution (% of total) of geobotanical papers (186) published in the period 1960-1991*

Region	Remote Sensing	Other
United States	52.0	68.4
Canada	28.5	0.0
Europe	12.4	11.0
Latin America	3.4	2.3
Rest of Asia	1.2	7.0
Former Soviet Union	1.2	2.3
Oceania	0.7	2.0
Africa	0.6	7.0
Total	100.0	100.0

Figure 1. *Astragulus pattersonii* an indirect indicator of uranium.

One of the most successful examples of geobotanical prospecting has been shown by Helen Cannon of the USGS. In the 1950s and 1960s she plotted the distribution of *Astragalus* plants that are hyperaccumulators of selenium (>1% in dry matter). These plants indirectly indicate uranium because uranium and selenium are found together in the mineral carnotite. Her work led to the discovery of several uranium deposits in the Western United States. One of these plants *Astragalus pattersonii* is illustrated in Figure 1.

Biogeochemical Prospecting

Biogeochemical methods of prospecting are based on chemical analysis of plant material in order to detect the presence of mineralisation in the underlying substrate. The history of this technique began with the work of Tkalich (1938) who detected an arsenopyrite deposit after analysis of iron in the overlying vegetation. In the West, H V Warren, who is still alive in British Columbia, is regarded as the father of biogeochemical prospecting. During the war years, whilst digging trenches to reach bedrock, he realised that tree roots were reaching the same zone. He then began a series of studies that were to continue for 40 years. To use his own words, he was able to raise the credibility of biogeochemistry from "general disbelief through benevolent scepticism to general acceptance".

My colleagues, students and I initiated biogeochemical prospecting in New Zealand in 1965 and continued the studies for a further 20 years. The studies showed that chemical analysis of vegetation provided an alternative to soil analyses for delineation of mineralisation anomalies in this country. The studies extended from Coppermine Island (Hen and Chickens Group) all the way down to Port Pegasus in the south of Stewart Island.

In the former Soviet Union, A L Kovalevsky based at Ulan Ude in Siberia has become the leading biogeochemist in Russia. His outstanding contribution to the science has been identification of plant organs that give the best indication of mineralisation below the surface of the soil. He is today the undisputed leader in biogeochemical prospecting.

The leading biogeochemist in The West is Colin E Dunn of the Geological Society of Canada. His work has centred largely around gold and uranium. He was responsible for the discovery of a very large uranium deposit situated about 150 m below the surface at Wollaston in northern Saskatchewan. The surface soils gave no indication of uranium, but twigs of black spruce (*Picea mariana*) delineated the deposit very accurately. The current biogeochemical prospecting emphasis is on gold. Gold is present in soils as discrete isolated particles that are inhomogeously distributed . For this reason, soil samples need to have a mass of at least 1000 g to ensure that the sample is representative of the whole. Trees and large shrubs however, effectively sample many cubic metres of soil. Although gold was once thought of as being a very stable metal that is virtually insoluble in mineral acids, it is always accumulated by vegetation to a background level of perhaps 1 ng/g (ppb) dry weight and up to several hundred ng/g in mineralised soil. In Canada and the United States, about US$1 M is spent annually just for analysing gold in plant material. Dr Dunn has also initiated a remarkable technique in which the growing tips of conifers are sampled from a helicopter and analysed to show anomalous gold levels that might be associated with mineralisation in the substrate.

Geozoological Prospecting

The idea of using animals as field assistants in mineral prospecting might as first sight seem to be absurd. However it has been shown by Brooks *et al.* (1995) that, mammals, fish and insects can indeed be used for this purpose.

The use of dogs for mineral prospecting was first proposed by Orlov *et al.* (1969) and was later developed also in Fennoscandia and Canada. The principle of the technique is that dogs with their keen sense of smell can detect sulfide minerals from the characteristic smell of sulfur emanating from them. This method is particularly relevant for northern Europe, Siberia and North America where mineralised boulders transported by glacial activity are often the targets for exploration geochemists.

Marine organisms such as seaweeds have also been used in mineral prospecting. These marine algae are able to concentrate levels of trace elements by a factor of at least 10,000 compared with the sea water itself. Dunn (1990) has shown that various seaweeds could be used to detect a zone of copper/gold mineralisation on the shores of Texada Island, British Columbia. They determined 33 elements in the plant material and were able to identify the deposit by anomalous concentrations of arsenic, that is usually associated with other sulfide mineral elements.

The most promising animal "field assistants" are the humble termites. The use of termites for prospecting was recorded by the Greek historian Herodotus in 450 BC. He described a method of gold prospecting used by Indians.

"They found in the desert a kind of ant of great size, bigger than a fox though not bigger than a dog. These creatures...throw up the sand in heaps...The sand has a rich content of gold."

In the late 1960s, West (1970) noticed that termites burrow down to the water table and in the process bring up a large amount of soil from a depth of 10 metres or more. In Zimbabwe, the surface is often covered by a layer of Kalahari sand transported by the wind and which does not represent the nature of the substrate at all. The termites have been doing the work for the prospector without charge and because their mounds are spread rather uniformly across the terrain, it is possible to carry out a survey on a square grid of termite mounds. As a result of West's work, several gold anomalies have been discovered, the first of these is now appropriately name "Termite Mine". Since the initial work of West (1970) numerous surveys of termite mounds have been carried out, mainly in Africa, and have resulted in some important discoveries.

Geomicrobiology

In descending the scale of size from trees to dogs to termites, the technique of geomicrobiology uses even smaller biota, the humble microbe. It is well known that microorganisms have an important role to play in the processing of minerals. For example the bacterium *Thiobacillus ferrooxidans* can convert sulfide to sulfate and can be used to transform insoluble copper sulfide to soluble copper sulfate that can then be leached with water from a stockpile of excavated ore (Brierley 1982). These geomicrobiological techniques are now well established and in the United States alone, some 20% of the annual copper production is derived from microbiological processing of low-grade ores.

A recent development in geomicrobiological prospecting (Parduhn, 1995) involves the discovery that bacteria resistant to heavy metals are also resistant to antibiotics such as penicillin. Parduhn (1995) carried out her studies on *Bacillus cereus* extracted from soil samples take across mineralised terrain through to background on each side. The methodology is based on shaking a small soil sample with water and, after centrifugation, removing small aliquots for transfer to pour plates containing unamended or penicillin-amended *B.cereus* test media. After 14-20 hours, the plates are examined for the appearance of circular opaque spots surrounding each pinpoint bacterial colony. The method is now fairly well established in North America and has been tested over a wide range of environments. It has been used for gold exploration, particularly in desert terrain where conventional geochemical methods have limited effectiveness due to leached soils or where mineral deposits are located beneath a thick overburden.

In Conclusion

The increasing interest in biological methods of exploration during the past decade is related not only to their intrinsic potential but also to the fact that in this environmentally conscious era they are "green". They do not involve the digging of deep pits or trenches that disfigure the environment. They allow plant roots to do the work or employ termites to transport the mineralised soil to the surface. At a time when most of the world's obvious mineral deposits have already been discovered, we must rely on new and more subtle methods to discover those that remain.

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Research Frontiers

ACEYLENE DIRECT

A method for converting natural gas methane into the more useful compound acetylene at room temperature has been developed by Japanese chemists (*Chem.Comm.*, 1999, p 2485). The technique uses an electric discharge rather than the 1273 K pyrolysis temperatures that are usually required for such a direct conversion, making it a simpler and cleaner process for utilising non-oil-delivered chemical feed stocks.

Shigeru Kadu and his colleagues at the University of Tokyo point out that methane is usually so stable that the only way to convert it directly into higher hydrocarbons is by using a combination of high pressure and high temperature or a suitable catalyst in a plasma discharge. For instance, with an NaY zeolite catalyst, high yields of C_2 hydrocarbon can be produced.

However, while simply heating to the pyrolysis temperature is effective at conversion, the blast usually decomposes much of the product down to carbon.

The Japanese team wanted to avoid the use of catalysts and high temperatures. As Kado explained: "We are using a pulse discharge lasting less than one microsecond, which means that only electrons are accelerated and other species remain in a non-equilibrium state, keeping the reaction at room temperature in the gas phase, and the products are not decomposed".

The researchers built a flow reactor into which methane could be pumped at atmospheric or higher pressure for greater product throughput and ambient temperature. They placed a steel electrode at each end of the flow chamber. They then fed in pure methane and pulsed the gas at up to 60 watts and obtained greater than 90 per cent conversion to acetylene in the absence of a catalyst.

There was little ethylene or ethane by-product and conversion to yet higher hydrocarbons such as 1-propyne and 1,3 butadiene was less than 1 per cent. Meanwhile, there was some soot deposition on the electrodes and the inside of the reaction chamber, which Kado says ultimately locks the reaction. A 5:1:4 mix of methane:oxygen:argon helped reduce the soot formation.

They found that with this gas feed there was not much change to the overall reaction products, with the proportions of by-products remaining fairly constant. There were, of course, the additional by-products of carbon monoxide and carbon dioxide. However, the reaction of the soot with the oxygen under discharge - from which these by-products originate - actually stabilises the discharge itself, thus boding well for a longer running reaction.

The researchers point out that they can avoid carbon monoxide as a by-product by using methane mixed with hydrogen gas at 1:4. This also helps stabilise the discharge and, up to a limit, achieves similar conversion selectivity.

David Bradley
Chemistry in Britain, **36** (3), March 2000

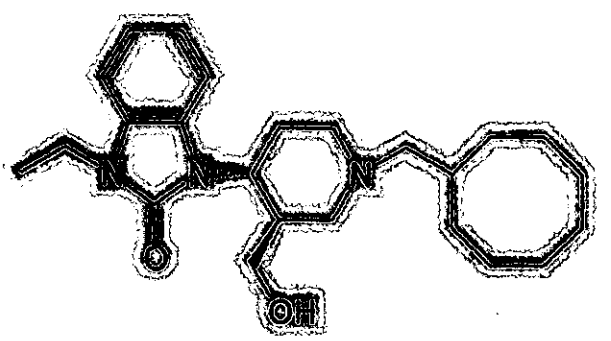
NEW TOOL FOR USE IN PAIN RESEARCH

The three classical opioid receptors, μ, δ and κ, on which morphine and related analgesics act - have important physiological and pharmacological roles, especially in pain regulation.

Opioid receptor-like 1 (ORL1), a fourth opioid receptor, was identified in 1994 through cDNA expression cloning techniques. In 1995, scientists found a peptide in the body that binds to the ORL1 receptor and suggested that blocking this hormone, known as nociceptin or orphanin FQ, may make a person less sensitive to pain.

Now researchers at Banyu Pharmaceutical, Japan, have come up with the first small molecule that can potently and selectively block this hormone-receptor system (*J. Med. Chem.*, 1999, **25**, p 5061).

The compound 1-[(3R, 4R)-1-cyclooctylmethyl-3-hydroxymethyl-4-piperidyl]-3-ethyl-1,3-dihydro2H-benzimidazol-2-one (J-113397) binds to ORL1 at nanomolar concentration with a selectivity greater that 600-fold over μ–, δ– and κ–receptors and inhibits ORL1 function.



The Japanese researchers say that this synthetic ORL1 antagonist will allow the functions of the hormone-ORL1 system to be observed and tested. This opens a new avenue for pain research and could be key to the development of new and improved drugs to treat pain.

Research Frontiers

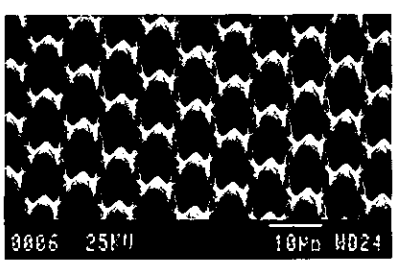
Studies in mice suggest that the ORL1 receptor and its corresponding hormones may play important roles not only in regulating pain response but also in morphine tolerance, learning and memory, food intake, anxiety, and other neurological responses.

Chemistry in Britain, **36** (3), March 2000

INSPIRING CLEANLINESS

According to the ancient Chinese game of Mah Jongg, the lotus plant signifies new ideas or enlightenment for the bearer of the card showing this flower. Recently, it appears that the plant has been living up to its reputation by providing the inspiration for researchers to develop novel self-cleaning materials. What's more, the fortunes of many researchers could rest on a startling discovery by Wilhelm Barthlott and Christoph Neinhuis at the University of Bonn in Germany, which explains why the leaves of the lotus plant are always so clean and dry.

Looking at the leaves of the lotus under a scanning electron microscope, Barthlott and Neinhuis found that the surfaces of the leaves are covered in a unique array of evenly spaced bumps (see figure below) tens of hundreds of μm in size. This 'microscopic bed of nails' helps keep the plant clean by preventing even a speck of dust from adhering to the lotus. The tiny protrubrances ensure that any dirt merely rests on the surface without sticking to the leaves; when it rains the dirt collects in drops on the surface of the plant and is simply rinsed away.



Now a group of other researchers, at the Creavis Company for Technology and Innovation in Marl, Fraunhofer Institute for Solar Energy (ISE)Systems in Freiburg and elsewhere in Germany, has begun to apply this same idea to make synthetic surfaces that can be cleaned quickly by using only water. Their success is down to finding an inexpensive way of recreating the lotus leaf bumps by coating a range of hydrophobic (water repelling) plastic surfaces with such tiny protruberances.

The method that they have come up with uses a process known as micro-replication, which involves making many copies of fine (50 μm to 5 mm thick) nickel foils with the same microstructured pattern. The first foil is very expensive to produce, because it involves using light exposure to demarcate the pattern on a light sensitive material known as photoresist before making the nickel foil by electroforming. Copies made from this original nickel foil are much easier and less expensive to produce.

The resulting nickel foils serves as stamps or dies that can be pressed into the hot polymer during the process of embossing, after which the nickel foil and polymer are cooled and separated. Polymer films made using these foils should be commercially available in the next two years, but the method should be potentially useful for many other materials with embossing process below 400 °C. Applications could include making cleaner traffic signposts, graffiti free concrete, and preventing algal growth on damp buildings.

Chemistry in Britain, **36** (3), March 2000

DESIGNER CATALYSTS

Recent work by California Institute of Technology (Caltech) researcher Robert Grubbs and coworkers to extend the catalyst toolbox available for constructing polyolefins promises to expand the current range of designer polymers.

Developments in metallocene catalysts that allow better reaction control compared with traditional heterogeneous Zieger-Natta catalysts have already seen the introduction of tailored varieties of polyolefins with new and improved properties over the past decade.

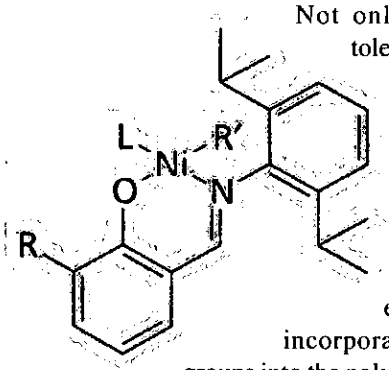
Metallocene catalysts owe their success to the fact that they possess a single active site, based on one or other of the early transition metals M; their activity involves the formation of a cationic metal centre, L_nMR+, where R is an alkyl, hydrido or aryl group and L is a ligand. However, the formation of this cationic metal centre means that the catalysts are susceptible to nucleophilic attack and are unable to tolerate heteroatoms such as O, N and S. Not only must the polymerisations be performed in a moisture-free atmosphere, but the starting materials and cocatalysts need to be scrupulously clean before reaction, which incurs a substantial cost.

Petrochemical company Shell overcome this drawback in this so-called Shop process for synthesising linear ethylene oligomers, with carbon chain lengths ranging from C_4 to C_{20}, by using a catalyst based on Ni chelated to a phosphorus-oxygenated ligand. Ni is to the right of the Periodic table and is a late transition metal - it is considerably less electrophilic and oxophilic (oxygen loving) than the early transition metals. This explains the

Research Frontiers

tolerance of the Shop process towards heteroatoms, which is why these oligomerisations can be performed in solvents such as ethanol or acetone. The resulting oligomers can be converted to plasticisers, lubricants, detergents and various fine chemicals.

Caltech researchers reasoned that replacing the P-O chelate of the neutral Shop catalysts with a harder, more sterically-hindered, nitrogen-based ligand might allow them to produce higher molecular weight polmers. The ligand that the researchers chose to use as the scaffold for their catalysts was based on salicyladimines - ligands that allowed them to vary systematically the electronic and steric properties. By making these ligands sufficiently bulky, Grubbs and his team were able to produce a series of Ni (II) salicylaldime complexes (see figure below) capable of catalysing the production of polyethylene (PE) with MWs > 250, 000 with just five to 20 branches per 1000 C atoms.



Not only did the catalyst tolerate heteroatoms, but including additives such as acetone, ethyl acetate, triethylamine and water in these experiments the researchers were effectively able to incorporate polar functional groups into the polymer chain - a feat not previously possible with conventional catalysts for olefin polymerisations. The discovery of these highly active, single-site late transition metal polymerisation catalysts therefore opens up the possibility of producing new polyolefins with novel functionality.

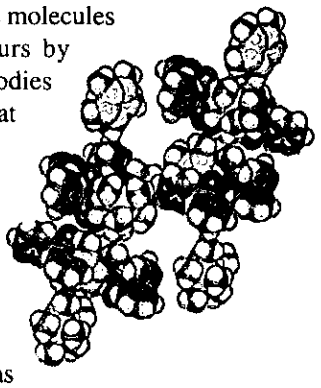
It is perhaps ironic that the metal at the centre of all this - Ni - was also once a source of irritation for earlier researchers investigating ethylene chemistry. In the 1950s Erhard Holzkamp, a doctor student of Karl Zeigler at the Max Planck Institute in Germany, found that nickel impurities were inhibiting his attempts to reproduce the Aufbau reaction, in which a molecule of ethylene is inserted into the C-M bonds of triethylaluminium. It was this observation that led the Zieger laboratory to carry out a systematic study of the effects on the Aufbau reaction - and ultimately to the discovery of the Zieger-Natta polymerisation catalysts.

Chemistry in Britain, 37 (**3**), March 2000

CAGED ELECTRON

US chemists have built a beautiful blue molecular cage in which they can trap a single electron. This cage is stable and the chemists believe it may help in the design of novel anticancer drugs, and in materials science.

Frederick Hawthorne and his colleagues at the University of California in Los Angeles are researching organoboron cage compounds, which can be used to deliver a radiation dose direct to tumors. The molecules are directed to the tumours by using, for example, antibodies and act like 'landmines' that are activated with a blast of neutrons. The neutrons trigger nuclear fission of the boron atoms, thus releasing helium and lithium nuclei, which are lethal to the cancer cells. This technology, known as boron-neutorn capture, is being tested in clinical trials for brain and other kinds of tumour that are difficult to treat surgically or with chemotherapy drugs.

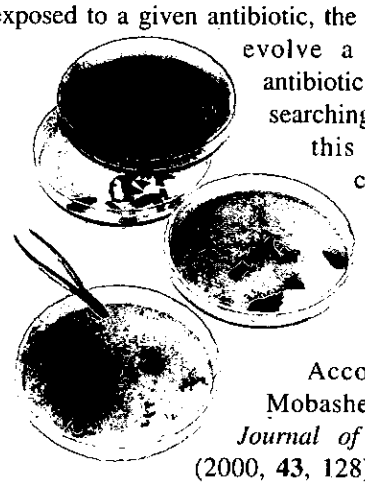


Hawthornes team, icluding Toralf Peymann and Carolyn Knobler, has built a $\{[closo\text{-}B_{12}(CH_3)_{12}].\}$cage. They used ceric (iv) ammonium nitrate (CAN) in acetonitrile to oxidise - by one electron - the non-radical cage. This formed a radical cage with a single electron trapped in the hydorcarbon layer of the borane molecule. Hawthorne believes that these molecules provide important clues about the chemistry of boron-neutron capture agents, and will ulitimately help in the design of better versions of these drugs.

Education in Chemistry, **37** (2), March 2000

CHEMISTS FIGHT DRUG RESISTANCE

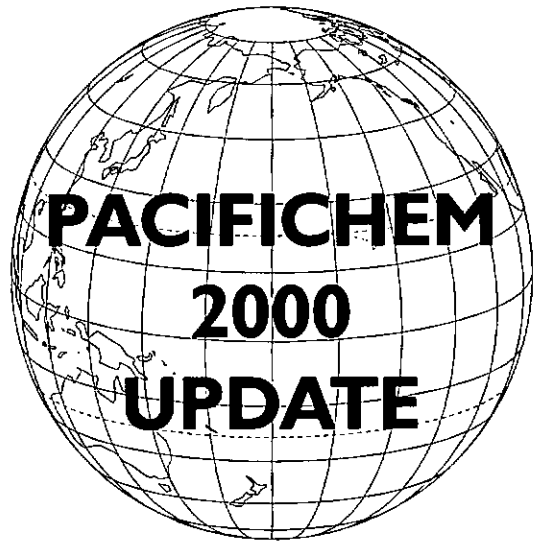
While antibiotics are among the most widely prescribed drugs in the world, paradoxically, their widespread use now poses a growing health threat - i.e. antibiotic resistance. Once bacteria are exposed to an antibiotic, in time they become resistant to its action by changing their own make-up to survive. The longer the bacteria are exposed to a given antibiotic, the more likely they will evolve a resistance to that antibiotic. Now after years of searching for ways to resolve this growing problem, chemists at Wayne State University in Detroit, USA, think they have found some answers.



According to Shahriar Mobashery, reporting in the *Journal of Medicinal Chemistry* (2000, **43**, 128), antibiotics are not usually metabolised in the body but are eventually eliminated into sewers and the environment. This provides

increased opportunities for the bacteria to develop resistance to the antibioticcs in these environments. By chemically modifying cephalosporin, which is structurally similar to penicillinm, Mobashery and his team have designed a new antibiotic with built-in light sensitivity. The 'light-sensitive' part of the molecule is destroyed when the drug is exposed to light outside the body. In theory, the researchers reason that this should limit the time that the antibiotic remains in the environment and therefore limit the development of resistance. The researchers believe that the antibiotics can be made to 'self-destruct' in other ways, including, for example, by making them sensitive to certain pH levels or other environmental conditions. The modified antibiotics have yet to be tested in humans or animals. In another project, Mobashery and his team have been looking at aminoglycoside antibiotics, which are also commonly used to fight infection. According to the researchers, reporting their results in the *Journal of the American Chemical Society* (1999, **121**, 1922), enzymes from disease-causing bacteria attack this antibiotic, rendering it inactive by adding an inhibitory group to its structure. The researchers have again chemically modified this antibiotic so that it receives the inhibitory group and then, after a short time, releases it. Thus, the original active form of the antibiotic regenerates and remains effective at fighting bacteria. According to the researchers, the 'self-generating' antibiotic fosters an environment on which the development of resistance enzymes in bacteria is no longer favoured. Like the 'self-destructive' antibiotic, however, these drugs have yet to be tested in humans or animals.

Education in Chemistry, **37 (2)**, March 2000



Pacifichem 2000 promises to surpass Pacifichem 1995! The electronic and hard copy abstract submission date was extended to 30 April by which time some 6000 original abstracts had been received. These are now being assessed by the various symposium organisers and the full December programme will be compiled by the Organising Committee at its final meeting in early June.

Abstract submission: Closed on April 30, 2000

Registration and Accommodation: Details for registration, accommodation, and tour options will be published in *Chemistry in New Zealand* in the July/August 2000 issue and will be available electronically from the web site from mid-July. Registration fees with late on-site registration fees in parenthesis are:

NZIC Member	$US340 (410)
Non-member	$US420 (505)
Full-time student	$US 75 (90)
Guest of Registrant	$US 50 (50)

http://www.acs.org/meetings/pacific2000/

Travel: As the number of airlines servicing Honolulu from New Zealand is not great [Air New Zealand (direct service), Air Pacific (via Fiji) and Qantas (via Sydney)] attendees are encouraged to make their travel arrangements early. Please remember that the Congress commences on Thursday, December 14 and concludes in the afternoon of Tuesday, December 19. The direct service from Auckland to Honolulu on Thursday December 14 arrives a little before midnight on Wednesday, December 13; direct departure to Auckland during the evening of December 19 (or shortly after midnight) will have a Thursday morning arrival in Auckland in good time for Christmas!

Further details are available from the web site listed above or from:

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International News

INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE (IPCC) REAFFIRMS HUMAN INFLUENCE ON GLOBAL WARMING

On 18 April, the United States Intergovernmental Panel on Climate Change (IPCC) released its latest draft report, which reaffirms and strengthens the major findings of its 1995 assessment of global warming.

The primary conclusion of both assessments: The body of evidence suggests "there has been a discernible human influence on global climate," primarily because of CO_2 emissions from burning fossil fuels.

According to the latest report, global average surface air temperatures have risen 0.7 to 1.5 degrees F since 1860 and are likely to rise an additional 1.8 to 1.9 degrees F by the end of the 21st Century. IPCC is a collaboration of hundreds of scientists sponsored by the United Nations and the World Meteorological Organisation.

The rate and duration of the rise in average global temperature during the 20th Century appear to have been the largest of any during the past 1,000 years, the IPCC report says. Better statistical methods for analysing data, better computer models, and a much better synthesis of paleoclimatic data have brought man-made climate change "out of the noise of natural variability," says Dr Kevin E Trenberth, Hon FRSNZ, Head of the Climate Analysis Section at the National Center for Atmospheric Research in Boulder, Colorado, USA, and a lead author of the draft report.

The IPCC report lists several climate changes that its authors conclude have already taken place. These include an increase in annual precipitation over land in the mid- and high latitudes of the Northern Hemisphere—owing largely to increases in extreme precipitation events—and a decrease in the extent of snow cover in the Northern Hemisphere due to early melting. In addition, the thickness of Arctic sea ice in summer or early autumn has declined 40% over roughly the past three decades, while the rate of sea level rise is now faster than at any time during the past 1,000 years.

For the 21st century, the report predicts relatively large increases in the heat index—the temperature the body feels—as temperatures and humidity continue to rise. On a global basis, average precipitation intensities will strengthen, leading to increased risk of flooding, while drought will be more likely in mid-continental areas.

The largest uncertainty in modelling future climate arises from clouds, the report notes. Major questions remain about whether clouds will dampen or accelerate the temperature rise as they respond to higher levels of CO_2 in the atmosphere.

EQUAL OPPORTUNITIES IN SCIENCE

The European Technology Assessment Network (ETAN) report on Women in Science was published late last year. Under the auspices of ETAN, a Women and Science committee was set up to examine gender aspects of research policy in the EU. To some extent this has followed the example of the 1994 UK report The Rising Tide, and the UK members of the ETAN group, Joan Mason and Anne McLaren (both from UK AWiSE) were involved in both.

The Women in Science Report has been presented to the European Commission, and to a policy seminar in Helsinki. Reports have also appeared in *Nature* and *Science*, 25 and 26 November 1999 respectively, and the *Times Higher Education Supplement* of 3 December 1999, entitled "Gender discrimination undermines science", "EU confronts the gender gap" and "On the shoulders of giantesses?"

Joan Mason reports "Journalists have taken an interest in the report's statistical data showing how few women survive in science to reach the top of their profession, in scientific academies, for example. The Royal Society of New Zealand Fellowship comes out well, with 7.3% of women fellows. The Royal Society of London does less well, although it is improving. The proportion has hovered around 3% since the middle 1960s. However, in 1999 the Royal Society of London elected five women out of 42 new fellows. The US National Academy of Sciences has increased its score from 4.4% in 1992 to 6.2% in 1999; in 1999 it elected nine women among its 60 new members."

Although the Royal Society of New Zealand comes out better than most in Fellowship terms, CEO Mr Ross Moore said the Academy Council acknowledged there was a need to improve the situation and was taking active steps to study the reasons why women were not being nominated for Fellowship in the same numbers as men. Mr Moore said women were about 25% of the Society's overall membership and this percentage was destined to increase significantly in the near future.

DIFFERING PERSPECTIVES ON AUSTRALIAN BUDGET

The official Australian Government statement concerning research funding is quoted below, together with editorial comment in the *Australian* and a press release by the President of the Federation of Australian Scientific and Technological Societies (FASTS). Can they be talking about the same document? First, the Education Minister's offering:

Australian universities will receive $A 62.8 million ($NZ 76.52 million) over three years to boost their research coffers. Education Minister Dr David Kemp said the Federal budget would also include a further $A 16.3 million over four years for infrastructure to support large-scale

collaborative research. "This funding will be used to strengthen university-industry collaboration and will continue to be strengthened with universities and industry working together in providing research opportunities for students and researchers," Dr Kemp said.

The funding boost comes just one week after Australian Research Council chief Professor Vicki Sara said Australia must invest in research or risk being left behind the rest of the world. Australian budget "disgraceful" An extract from the editorial in the *Australian* (10 May 2000) sums up the views of trans-Tasman scientists, technologists and educationalists on the 2000 Budget as presented to the Federal Parliament earlier this week. The extract reads:

"... But it is disgraceful that in education and science, both areas in which the Coalition has talked up expectations, the Budget fails to deliver. The Government stands condemned for its lack of commitment. It is unconscionable that a country that claims to be an important part of the increasingly global economy puts so little into tertiary education and fails to understand the need to stimulate scientific research..." The Federation of Australian Scientific and Technological Societies (FASTS) is similarly critical of the Australian Budget. In a statement issued on 9 May 2000, the FASTS President said:

Australia's peak council for scientists and technologists said that the Budget confirmed that Australia would continue to wear the "old economy" tag given it by international money markets. Professor Sue Serjeantson, President of FASTS, said that national policy had failed to come to grips with the speed the world is moving. "The rest of the world is investing in research and innovation while Australia considers reports," she said. "This Budget has not made the necessary investment decisions, and we are falling behind. Australia is failing to keep up with the challenges of the knowledge-driven economy. The future lies in industries based on high technology, and this requires investment in research, development, innovation and industry links".

She pointed to a study released yesterday by the University of Melbourne, showing education expenditure by the Government is at its lowest level since 1991-92. "This Budget should have doubled the funding for the Australian Research Council, which would have helped reverse the decline in funding for Australian universities. It should have encouraged more scientists and mathematicians to become teachers, to inspire the next generation. It should have worked to reverse the decline in R&D by industry, and it should have restored funding stripped out of universities since 1996."

Professor Serjeantson said the Government would excuse its general inaction because it is working through a process. Both the Innovation Summit Implementation Group and the Chief Scientist are scheduled to release major recommendations in the next few months. "But Australia can't wait until Budget Day in 2001 for the Government to authorise expenditure in these areas. These recommendations should be implemented in a special mini-Budget as soon as they are released," she said.

Professor Serjeantson said the only bright spot in an otherwise gloomy budget was additional funding for medical research, and some sorely needed assistance to the higher education sector. "Now let's see the Government deal with 'unfinished business' in other areas of science, technology and higher education," she said.

Professor Serjeantson said the Government was pinning too many hopes on stimulating private investment in research and innovation. "Amending the capital gains tax system is a positive move, and I understand this has led to a healthy increase in venture capital investment in these areas. But the Government has a responsibility to invest in its own right, for all Australians with an interest in the future."

SHIMADZU CORPORATION CELEBRATES 125TH ANNIVERSARY

The year 2000 marks the 125th Anniversary of the Shimadzu Corporation. Founded in 1875 by Genzo Shimadzu to help support Japan's commitment to the advancement of science, the company began to produce physical and chemical apparatus for educational purposes. Over the years Shimadzu has remained committed to its charter to provide "Solutions for Science" and has grown to become a $2 billion multi-national corporation employing over 5000 people. The Shimadzu Corporation is comprised of 3 major divisions including Medical Diagnostics, Aerospace/Industrial and Analytical Instrumentation with offices and manufacturing facilities in over 70 countries around the globe. Shimadzu's Analytical Division is one of the world's largest manufacturers of analytical instrumentation and environmental monitoring equipment.

True to the inventive spirit of the company's founder, Genzo Shimadzu and subsequently his son Genzo Shimadzu, Jr. who was honoured by the Emperor as one of Japan's great inventors, Shimadzu has produced many firsts. One year after the discovery of x-rays by Nobel Laureate Wilhelm Rontgen, the company introduced the first medical x-ray machine in Japan. Shimadzu pioneered the development of electrical storage batteries, designed process control instrumentation to accelerate the country's industrial growth and in the early 1930s began production of control electronics for airplanes. In 1934, Shimadzu entered the analytical instrumentation field with Japan's first spectrograph. The company began producing electron microscopes in 1947, introduced the world's first UV-visible spectrophotometer with a photomultiplier tube detector in 1952, and the world's first gas chromatograph in 1957.

Shimadzu is now a world leader in the development of new technology for chromatography. Other GC firsts include a flow control system automatically compensated for both temperature and pressure as well as the first GC autosampling system to enable both small and large volume injection and sampling from up to 150 x 1.5 mL vials. In the field of HPLC, the constant displacement quick return solvent delivery system of the Shimadzu LC-3A represented a significant breakthrough to enable better resolution. In 1982 the company introduced the LC 5A,

the first HPLC system for 1 mm microbore column analysis.

Today, the Shimadzu Corporation continues to provide innovative solutions to the world's technology hurdles. In response to environmental concerns, the company developed a lactic acid biodegradable plastic. Most recently, Shimadzu scientists and engineers worked hand in glove with major pharmaceutical companies to develop new enabling technology to advance the drug discovery process.

NEW COMBINATORIAL CHEMISTRY CONSORTIUM

The four leading Internet sites devoted to combinatoral chemistry have formed the "Combi-Web Consortium" to centralise the vast array of information relating to this rapidly growing field.

The four founding members of the Combi-Web Consortium (Ken Browne, Barry A Bunin, Michael Lebl, and Guillermo Morales) stated: "By merging 5z.com, combinatorial.com, combichem.net, and combichemlab.com into the www.combi-web.com consortium, we have created the place to go for all types of information related to combinatorial chemistry on the Internet. The Combi-Web portal conveniently addresses the diverse needs to chemists worldwide."

The consortium provides extensive information such as industry news and reviews, full details of upcoming symposia of interest, and direct links to the organisers' web sites. Importantly, all the information is updated in real time to track the world of combinatorial chemistry as the field evolves.

Published information includes the *Molecular Diversity* journal, listing patents, and a regularly updated archive of related publications on library techniques and solid phase synthesis. It is notable that all the new articles on combinatorial synthesis are conveniently available in "The Combinatorial Index" format widely used by organic chemists. There are lists of other relevant journals with links to the publishers' sites.

A supplier index has been organized into sections to locate products and/or services of interest as easily and efficiently as possible. Also, links to other relevant sites, job listings and the ability to aquire specialist products on-line have been incorporated using the latest e-commerce technology.

CHEMISTRY NUMBERS CONTINUE TO FALL

According to figures recently released by the UK Universities and Colleges Admissions Service (UCAS), the number of students taking up UK university and college places in autumn 1999 was up by nearly 5000 (1.5 per cent) compared with 1998. Computer science, nursing, and software engineering degrees have shown some of the largest increases, with 15 per cent, 24 per cent and 10 per cent rises respectively. However, the number of students taking up places to study the sciences, i.e. engineering, chemistry, physics and biology, continues to decline with 6.5 per cent and 6.2 per cent less students than in 1998.

The figures for the number of applications to study the sciences in autumn 2000 have also been released and do not offer much in the way of comfort. According to UCAS, the number of students applying for places on chemistry and physics degrees in 2000 is down on 1999; 6.6 per cent less students have applied to study chemistry, and the figure for physics is 7.1 per cent. However, UCAS notes that the 2000 figures relate only to applications received by 15 December 1999. Over the past three year, there has been a trend for students to apply after the deadline date. If this trend continues, the decrease in numbers of science students may not be as great. However, it appears that the decline in students wanting to study science is still continuing.

These statistics and figures for individual colleges and universities as well as figures for previous years can be found on the UCAS website (http://ucas.ac.uk).

FOSS ACQUIRES LINBROOK IN AUSTRALIA

Foss ElectricA/S (Hillerod, Denmark) has agreed to acquire the business and assets of Linbrook Pty Ltd (Thornleigh, NSW), subject to completion of satisfactory due diligence and customary conditions of closing. Terms have not been disclosed, but the companies expect the transaction to be completed by 30 June, 2000. Linbrook, which refocused its business on the food, feeds and pharmaceuticals markets two years ago secured an order in mid-1999 for Foss Tecator NIR instruments worth A$10 million helping Foss consolidate its position as the dominant supplier of analytical instruments to the Australian grain industry.

AGILENT ACQUIRES J&W SCIENTIFIC

Agilent Technologies Inc. (Palo Alto, California, USA) has signed a merger agreement with J&W Scientific (Folsom, California, USA), the world's largest manufacturer and supplier of capillary GC columns. Industry observers note that J&W was bought by Saratoga Partners in 1995 for US$35 million and suggest that the price paid by Agilent was around twice revenues, being approximately US$23 million in 1999. J&W's profits have continued to be strong, another reason why over 20 companies and investment banks were interested in acquiring the business. Jeff White, General Manager of Agilent's CAG Consumables and Accessories Business Unit, said that, "our strategy is to aggressively expand and grow the consumables and accessories business and this acquisition is a critical part of our growth strategy". He added, "the aquisition of J&W will offer GC customers the highest level of expertise and technical support, and the widest range of instruments and supplies from a single source". In addition, with Rockland's Jack Kirkland and J&W's Walt Jennings, Agilent now has two of the best-known chromatographers backing it's technologies and applications.

LETTERS TO THE EDITOR

Dear Editor

EDUCATIONAL CANCER

The cancer that has been destroying the New Zealand educational system is now poised to devastate the teaching of chemistry. The campaign was launched in your issue of March/April 2000 in the article by Coll and Taylor on "Improved" Tertiary Chemistry Teaching".

"Constructivism", the belief that knowledge is not discovered, but is a construct of the human mind, is an attack on science and on knowledge itself. It replaces the essential function of education, the transmission of knowledge and skills and the development of learning and scholarship, with the nebulous and metaphysical concepts of "cognitive psychology", "problem solving ability" and "making sense of the world". Education is put into reverse: the teacher learns from the pupil. There is no longer a difference between right and wrong. It is OK to believe in phlogiston, creationism, astrology, drug-taking, burglary, provided that it "makes sense"

The voluminous references that accompany the article of Coll and Taylor do not include a single one which shows improvements in examination of scholarly success from the adoption of "constructivist" methods. That is because the "experiment" has been a ghastly failure. Our universities are awash with illiterate, innumerate students. Our teachers are demoralised by the bureaucracy involved, and by their loss of status.

The delusion has widespread victims. A recent US news item showed that mathematical skills have plummeted in the United States because students no longer learn mental arithmetic and are taught to use electronic calculators instead.

Perhaps the greatest devastation has been in the arts. I recently visited an exhibition of children's art. In countries like Sri Lanka, Indonesia, China, Jamaica, and Brazil, they still teach children to draw and to design. As a result their work is charming and stimulating. In Western countries (including our own) they are taught no artistic skills, but encouraged to "express themselves" with meaningless blobs and crude daubs comparable to the efforts of apes. No wonder that our Western art has declined to insignificance.

I recently taught at two universities in China, where I found the students eager to learn, hanging on every word of the teacher. Those learning English had a comprehensive knowledge of English grammar. Few New Zealanders could tell you the difference between an adverb and a pronoun.

The resurgence of science in the United States has been built up by immigrants from under-developed countries where the teaching depends on the acquisition of knowledge, not on the development of "cognitive ability". New Zealand science teachers and university chemistry lecturers must resist attacks by theoretical philosophers on the fundamental principles of learning, scholarship and science.

Yours sincerely

Vincent Gray

A Reply By The Authors ...

The letter from Vincent Gray seems remarkable to say the least. First, it is strange that he ostensibly believes that one article represents a campaign to 'devastate the teaching of chemistry'. Such a stance also is rather off-putting in that it accuses the authors of attempting to damage chemistry teaching. In fact it was our intention to achieve the opposite. It is curious that we are criticised for providing too many references, yet Vincent Gray makes a large number of subjective assertions and fails to back up his claims with any reference to studies that might support such views.

However, we are not opposed to rational debate. In fact we are pleased that our article has stimulated interest in the teaching of chemistry. Naturally as constructivists, we recognise that Gray's mental constructions regarding this issue differ from ours. We do accept that we have not made much of a case for the critics of constructivism (although the issue is discussed in Good, Wandersee & St Julien, 1993) and we are happy to supply such an article in the near future.

Richard Coll

Dear Editor

THE SELF INTERESTS OF SCIENTISTS

Recent events in the science and technological sector lead me to wonder whether the way it is set up contributes to some of the nation's ills. Consider the following:

What impels us to drive ever more to extend the frontiers of knowledge? Many will say it is to search for the truth; others would say that, like Everest, it is there and has to be mastered. But whilst there is undoubtedly something in these assertions is it not more honest to admit that it is basically reputation we are chasing because that enhances our chance of promotion, increased salary, success in

acquiring funding in this highly competitive environment and the size of our research teams and empire? A dramatic confirmation of this is the recent enquiry by the Association of Scientists as to what effect regulating GM trials would have on the scientists involved - not what effect it might have on the environmental and economic future of New Zealand.

But what are the consequences of such a one-eyed approach. Perhaps an illustration will help. Electronic technology has given us, *inter alia*, television, and biotechnology the pill. Psychology and information technology has taught that anything goes or is possible. Put that lot together and what do you have? - an easy going undisciplined society, unbridled sex, AIDS, inexcusable violence, suicides, environmental degradation, mountains of trash, unemployment, the almighty dollar and worse.

No doubt some would say that this is not due to science, but to the changing values of society. But if the microchip, the influence of hormones, radio waves and a better understanding of the human condition had not occurred, neither could there have been such dramatic consequences to scientists' work. Of course, the positive benefits of science and technology cannot be denied, so it becomes a question as to how we can avoid damaging effects and still have the benefits. And so I ask the question: "To what degree are scientists personally culpable of making possible the abuse of their discoveries; how far are their actions coerced by the system in which they have to operate; and can anything be done about it?"

To answer these questions three possibilities suggest themselves to me:

- Alter the system so that there is less incentive to develop a reputation by chasing money, bigger teams and more publications.
- As well as the benefits of their work publicise the possible detrimental effects. To do this, it might be desirable to cooperate with other organisations to explore good and bad prognostications.
- For scientists to develop a much clearer understanding of the values held by society, and of their own motivations, so that it becomes clear where the limits of discovery and exploitation should be drawn. For instance, whilst most of us play God from time to time, is there anything which should not be done for any reason, such as altering the course of human development or terminating life itself?

It seems to me that scientists and technologists have a responsibility to consider these matters and give a lead to the community at large. One thing seems to be certain. If scientists continue to be only self-interested, pursuing money, publications, promotions and power to the neglect of other interests, it is inevitable that society will impinge more forcefully on our activities, restricting what we do and perhaps making some beneficial outcomes of discovery unattainable. How much better for us to take the initiative and sort this matter out properly ourselves.

J F Duncan
Past Chairman, NZAS
Emeritus Professor, Victoria University
Founder Chairman, NZ Science Fairs, NZ Futures Trust

Book Review

DRUG METABOLISM; DATABASES AND HIGH-THROUGHPUT TESTING DURING DRUG DESIGN AND DEVELOPMENT
NZ$216.00, 340 pages, ISBN 0-632-05342-9

This book, edited by Paul W Erhardt and published by Blackwell Sciences, Oxford, UK for IUPAC, is the result of an IUPAC Working Party's 18-month effort. The remit of the Working Party was to consider the use of metabolism databases and their use in the development of new drugs. This is an issue of unparalleled current importance in drug design. The advent of combinatorial chemistry for rapid drug synthesis and high-throughput robotic primary screening against pure protein targets have moved the bottleneck in drug development to pharmacokinetics and (especially) metabolism studies. Much time would be saved if such assays could be prospective, or at least moved "upstream" in the drug development pipeline. The book is thus very timely.

The book is in three main sections: Case Studies, New Directions and Emerging Products. The reports in the Case Studies section on the use of computer-based "expert systems" to predict metabolism are interesting to read. Most of these do not rank the systems very highly, but (as retrospective studies) many are quite out of date, and one wonders if this is a fair representation of current programs. However, the Emerging Products section, describing current systems and written by authors from the vendor organisations, provides a counterbalance and very useful comparisons. Perhaps the most broadly useful part of the book is the New Directions section. These 13 chapters provide good background information in areas that are of current interest, particularly aspects of high throughput screening. The latter include specifically screening methods for GI absorption, CYP metabolism (2 separate chapters), more general metabolism and pharmacokinetics. Overall, the book provides very useful coverage of relevant topics related to high throughput screening of drug metabolism. It would be a useful addition to the libraries of any organisations involved with the metabolism aspects of drug development.

William A Denny
Auckland Cancer Society Research Centre
The University of Auckland

NEW PERKIN ELMER OPTIMA 4000 DV SERIES OES DELIVERS THE PERFORMANCE REQUIRED TO MAXIMISE ICP RODUCTIVITY

The new Optima 4000 Inductively Coupled Plasma (ICP) series from Perkin Elmer Instruments has the fundamental design performance required to improve method development and provide accurate and reliable answers. The instrument's powerful Segmented-array Charge-coupled Device (SCD) detector simultaneously measures all analyte wavelengths and background correction points, providing unmatched precision and accuracy while significantly reducing analysis time. Automatic dual viewing (DV) ensures the lowest detection limits and the widest working ranges. WinLab32, the Optima 4000's 32-bit Windows software, provides the tools needed to analyse samples, report and archive data, and ensure regulatory compliance.

The Optima 4000 series is different by design. Based on the highly successful Optima 3000, the new system combines proven technology with innovative enhancements, resulting in a reliable system that provides high sample throughput. The dual-detector option of the Optima 4000 series maximises light throughput and resolution for both the UV and visible wavelengths. The high resolution optical system provides fewer line interferences, making method development easier and faster, with better results.

Computer-controlled gas flows and mass flow of the nebuliser gas ensure day-to-day reproducibility. To eliminate interferences caused by the cooler regions in the plasma gas, the Optima 4000 ICP uses a unique compressed air shear gas system to remove the cool tail plume of the plasma. This provides a maintenance-free, reliable solution compared with other methods that use expensive argon gas and are prone to clogging.

WinLab32 software provides advanced capabilities and flexible control to boost productivity. It contains tools for both basic operation and advanced work, adapting well to multi-user environments. The WinLab32 software, based on Windows NT, also contains extensive security features, such as password-controlled access to software functions. To ensure regulatory compliance, the WinLab32 software offers multiple user-defined quality control (QC) standards, as well as a selection of calibration procedures. Programmable start-up and shut-down modes reduce cost of ownership and improve productivity. Advanced features, such as simultaneous background correction, Inter-Element Correction (IEC), and Multi-component Spectral Fitting (MSF), significantly enhance analytical performance and minimise potential interferences.

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REVOLUTIONARY NEW PERKIN ELMER OPTIMA 2000 DV SCANNING CCD ICP SYSTEM OFFERS INCREASED TIME SAVINGS AND PERFORMANCE

The new Optima 2000 DV Inductively Coupled Plasma (ICP) system from Perkin Elmer Instruments delivers the increased flexibility, superior performance, and enhanced reliability previously available only in high-end simultaneous systems. The instrument's unique scanning Charge-Coupled Device (CCD) significantly reduces analysis time for research and quality assurance laboratories by measuring the wavelength range around the emission line of interest simultaneously. Automatic dual viewing (DV) ensures the lowest detection limits and the widest working ranges. WinLab 32, the Optima 2000's 32-bit Windows software, provides the tools needed to analyse samples, report and archive data, and ensure regulatory compliance.

The Optima 2000's custom-designed solid-state detector, solid-state RF power supply, and sealed optical system reduce operating costs and ensure that the instrument is available when needed. In addition, the solid-state design makes the power supply exceptionally compact, saving valuable laboratory bench space. Computer-controlled gas flows and mass flow of the nebuliser gas ensure day-to-day reproducibility. To eliminate interferences caused by the cooler regions in the plasma gas, the Optima 2000 ICP system uses a unique compressed air shear gas system to remove the cool tail plume of the plasma. This provides a maintenance-free, reliable system as compared to other methods that use expensive argon gas and are prone to clogging.

The Optima 2000 system continually references a neon background making it faster and more precise than conventional systems that rely on mercury references between reads. Dynamic Wavelength Stabilisation (DWS) allows direct on-peak measurement that eliminates the need for peak searches and ensures long-term stability.

The unique optical system and the exceptional stability of the Optima 2000 instrument allow the WinLab32 software to include tools previously available only in high-end simultaneous ICP-OES instruments. Simultaneous background correction, Inter-Element Correction (IEC), and Multi-component Spectral Fitting (MSF) significantly enhance analytical performance and minimise potential interferences. The WinLab32 software, based on Windows NT, also contains extensive security features, such as password-controlled access to software functions. To ensure regulatory compliance, the Win32 software offers multiple user-defined quality control (QC) standards, as well as a selection of calibration procedures.

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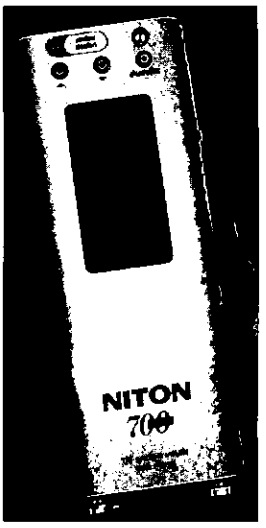
SOIL ABATEMENT WITH NITON XRF
Saving Money in Your Remediation Efforts Using NITRON's XRF Analysers

A rifle and handgun firing range may pose a significant lead contamination problem to surrounding communities. This problem occurred in a town in Connecticut, USA which contained an abandoned rifle and handgun firing range. The property had a potential buyer if remediation could occur quickly. In order to minimise the excavation and provide rapid turnaround of sample results, the project manager needed a device that could rapidly identify "hot spots" of lead on-site. The remedial plan, issued by the state of Connecticut, required that lead be removed to below 500 ppm in soil and have a mobility criteria less than 0.015 ppm. The sale of this property was contingent upon the expedited removal or abatement of the lead contamination.

The project manager, Fuss & O'Neil, selected an XRF manufactured by NITON Corporation due to its accuracy, ease of use, and portability. To initiate this removal effort Fuss & O'Neil re-evaluated 21 of the soil samples, perviously analysed by atomic absorption spectrometry (AAS), in a conventional field-based laboratory. This gave the contractor and regulator the confidence on data quality required to proceed with NITON's XRF as the primary decision-making tool to evaluate the site for removal and provide "real-time" measurements for remediation activities.

Based on the initial confirmation the use of NITON's XRF was approved and it was determined that one person could perform up to 100 analyses per day on unprepared samples. The remedial effort was conducted in only 4 days with Niton's XRF providing confimation that the remediation performed was sufficient to meet Connecticut's data quality objectives on-site. This effort provided outstanding correlation with AAS methods conducted in the fixed base laboratory. The majority of the 200 samples analysed by XRF was done in a two-day period. The cost equated to approximately US$15 per sample which included an operator, as compared to double that if conventional analysis has been used. "Per sample costs would have dropped significantly had we used this equipment for a longer period" stated Fuss & O'Neil. The length of use is directly proportional to the cost per sample, with higher volumes of sample decreasing per sample cost.

By using NITON's hand-held XRF, Fuss & O'Neil were able to save their client considerable money and time over conventional phased investigations and remediations. Cost savings were experienced in sample evaluations and reduction in contractor mobilisation charges, not to mention loss of the property sale by their client. NITON's XRF can perform numerous measurements of over 25 different metals in soil, dust wipes, air filters, paint, cement and alloy identification. Additionally, the NITON XRF can analyze all 8 RCRA metals allowing its users greater flexibility and improved efficiency for all environmental and worker exposure environments.



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TJA SOLUTIONS' IRIS ADVANTAGE ICAP SPECTROMETER

The innovative IRIS Advantage ICAP (Inductively Coupled Argon Plasma) Spectrometer series from TJA Solutions combines the speed and accuracy of a simultaneous ICP with the flexibility of a sequential system. The result is a powerful, easy-to-use elemental analysis solution that delivers high productivity and optimum analytical data - no compromises required.

The IRIS Advantage is versatile too. There are options for enhanced resolution as well as extended wavelength coverage. Both HR and standard systems can be designed for radial, axial or dual (radial or axial) plasma viewing.

Productivity: Simultaneous ICP analytical speed, Sequential ICP flexibility, ThermoSPEC/Win Software, high-performance Echelle Spectrometer, Proven crystal-controlled RF source.
Simplicity: Simple, elegant design, Intuitive Windows® 95/98 software.
Accuracy: Multiple lines for each element, Enhanced resolution for complex matrices.
Sensitivity: Excellent detection limits in radial, axial, and duo configurations.
Versatility: Full wavelength coverage with all spectral information available at a single glance, a complete range of accessories extends your analysis capabilities.

TJA Solutions' IRIS Advantage series extends the limits of ICP performance through a unique combination of leading-edge optical and detection technologies and pragmatic real-world engineering.

Extended wavelength range: The wavelength range now extends down to 165 nm, allowing the determination of Al at the sensitive 167.081 nm line, as well as the determination of N using the 174.272 nm line, while retaining the ability to measure K at 766.490 nm.
Full-range dual viewing capabilities: Select full-range axial, full-range radial or automatic plasma viewing orientation. In the automatic mode, low wavelengths are measured axially while longer wavelengths are viewed radially.
High-performance Echelle optics: Two dispersing elements - a grating and a prism - provide very high resolution as well as extended wavelength range.
Pumped drain and improved sample introduction options: A pumped drain improves analytical performance and minimises the handling of potentially hazardous materials, particularly when changing sample introduction systems.

TJA Solutions' exclusive CID technology enables selection of the best wavelengths for each element in every sample type. Entire sample spectra can be stored in memory, then recalled and reprocessed using different background corrections or internal standards to improve stability and sensitivity, without having to rerun the samples.

Contact: Glenn Grayston, Biolab Scientific Ltd
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VARIAN'S VISTA ICP-AES WINS ENGINEERING EXCELLENCE AWARD

Australia's Institution of Engineering recently honoured Varian, Inc's Vista ICP-AES for innovations that provide substantially increased productivity for users. Varian received one of only twelve 1999 Engineering Excellence Awards at the biennial awards ceremony held in Melbourne, Australia in October 1999.

The judges praised Varian for identifying the technological shift toward emission spectrometry and capitalising on that trend to satisfy a growing market need for simultaneous measurements. Vista's ability to concurrently measure both trace and major concentrations with alternate wavelengths translates into significant productivity gains for users.

The Vista CCD Simultaneous ICP-AES is the world's fastest instrument of its kind, featuring next-generation charge-coupled device (CCD) technology. Vista uses Varian's patented VistaChip detector technology to measure 73 elements in just 35 seconds, with a detector readout speed up to 80 times faster than competing instruments.

Approximately 100 entries were judged on each product's individual merits and on the extent to which they met the following mandatory criteria: use of sound engineering practices and principles; originality and ingenuity of the solution; benefit to the community; skills formation; adherence to the budget and program; and quality of business case.

The last awards ceremony occurred in 1997, at which Varian was honoured for its Cary 50 UV-Visible Spectrophotometer and SpectrAA-220 Fast Sequential Atomic Absorption Spectrometer. Varian was the only company to receive awards at two consecutive ceremonies.

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AANALYST 800 AA SPECTROMETER TECHNICAL NOTES HIGHLIGHTING INSTRUMENT DETECTION LIMITS NOW AVAILABLE FROM PERKINELMER

A series of new technical notes detailing instrument detection limits (IDL) for Perkin-Elmer's AAnalyst 800 atomic absorption (AA) spectrometer is now available from Perkin-Elmer. The series of technical notes describes elemental analysis for the following: cadmium (Order No D-5733); palladium (Order No D-5731); selenium (Order No D-5732); chromium (Order No D-5733); copper (Order No D-5734); maganese (Order No D-5735); molybdenum (Order No D-5736); nickel (Order No D-5737A); and arsenic (Order No D-5743). The technical notes provide support data for the instrument detection limits produced on the AA800 system. This includes the experimental details, typical graphite furnace atomic absorption signals and other data used to calculate the IDL, precision at low concentrations and the characteristic mass data. Further information is provided to allow an experimental user to repeat these measurements.

The AAnalyst 800 atomic absorption (AA) spectrometer is equipped with a unique solid-state detector for unmatched analytical performance over the entire AA wavelength range. High performance, single path optics provides the AAnalyst 800 spectrometer with maximum light throughput and an exceptional signal-to-noise ratio for superior detection limits and precision. In addition, the spectrometer features an easily accessible eight-lamp holder with built-in power supplies for hollow cathode and electrodeless discharge lamps. Automatic lamp selection and alignment provide enhanced convenience and productivity.The AAnalyst 800 spectrometer's state-of-the-art detector and high-performance optical system are combined with a Transversely Heated Graphite Atomiser (THGA) furnace assembly, longitudinal Zeeman-effect background correction, enhanced STPF technology and True Temperature Control (TTC) for unmatched graphite furnace AA performance.

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Patent Proze

by Jane Calvert and Greg Lynch

CONFIDENTIALITY AGREEMENTS

From an earlier *Patent Proze* (see *Chemistry in New Zealand* **61**, 3 (May/June 1997)) you may recall that it is a statutory requirement for the grant of a patent that the "invention" for which patent protection is sought, is novel. This means that any publication or use of the invention before any patent application is filed may jeopardise the grant of a valid patent.

We have received a number of enquiries from people concerned about whether or not it is possible to rely on confidentiality agreements or marking documents "Confidential" when disclosing information before filing a patent application. Such situations might arise when one is making applications for funding or when disclosing details of an invention to an interested potential collaborator or funding partner.

What Is A Confidentiality Agreement?

A confidentiality agreement is an agreement between a party disclosing some confidential information and a party receiving that information. The agreement basically states that the receiving party agrees not to disclose or use the information without the approval of the disclosing party. However, if a confidentiality agreement is breached by the receiver of the information, the discloser can sue for the damage suffered as a result of that disclosure. This could be the profit that could have been made from the use of the information and any additional damage that has been suffered.

However, there are serious drawbacks with the use of confidentiality agreements as follows:

- It may be difficult to prove that the discloser has disclosed the confidential information to another party, especially where the only evidence is that a similar product to yours is being commercialised. You must therefore satisfy yourself that the party receiving the information is trustworthy.
- Once the information is public your only remedy is to sue the party that disclosed the information without your approval. Such legal proceedings are expensive and the outcome may be uncertain.
- Any damages recoverable from the party that disclosed the information will be limited by the available assets of that party. It is our recommendation that you must be satisfied that any party signing a confidentiality agreement has sufficient assets to meet such a claim.

Sometimes it is even difficult to establish the significance of some confidential information being disclosed. The factors to be kept in mind to help establish the significance are:

- the nature of the material
- the obligation of confidence
- the loss that could accrue if the material was used without authorisation.

If it is not possible to file a patent application prior to entering into discussions, a confidentiality agreement should be obtained. Additionally, it would be advisable to reinforce with your employees or students that the details of the invention are confidential and that no disclosure is to be made without appropriate approval. Some organisations require their own employees or students to sign confidentiality agreements.

Most applications for funding are handled on a confidential basis. However, some funding applications involve third party reviewers. For those applications it is not always clear that the third party reviewer is under an obligation of confidence and that the information supplied is done so on a confidential basis. There is well known case law that makes it quite clear that where a single copy of a particular document was obtained by a third party or a commercial organisation before a patent application was filed, and it was not clear from the face of the document that the information was confidential, then the novelty of the patent in question is destroyed. We would certainly recommend in those instances to mark all confidential documents clearly with the word "Confidential" to avoid such doubt.

Jane Calvert

Jane Calvert and Greg Lynch are both employed in the patent department of Baldwin Shelston Waters, Patent and Trademark Attorneys and Solicitors, where they specialise in chemistry patents. Jane joined the firm after completing a PhD in Chemistry at the University of Canterbury in 1994. Greg also joined the firm in 1994 after three years research at Industrial Research Limited in Wellington. Following completion of a PhD in chemistry at the University of Otago in 1989, he spent a two year period as a post-doctoral researcher at Oxford in the United Kingdom.

Greg Lynch

In summary, confidentiality agreements should be used with caution. If there are doubts, it is wise to file a patent application before any disclosure is made. It is possible to file a patent application covering the basic concept of an invention. Once further research has been done, a second application can be filed covering the details of the invention that the research develops. If you are interested in adopting this strategy, it would be best to consult your patent attorney to discuss the options that are available.

A reminder: If you have any queries regarding patents, or indeed any form of intellectual property, please direct them to:

Patent Proze
Baldwin Shelston Waters
P O Box 852, Wellington
Email: email@bswip.co.nz
Internet: www.bswip.co.nz

IUPAC NEWS

A STRATEGY FOR EDUCATIONAL POLICY

The first two-day meeting of the *ad hoc* IUPAC Education Strategy Development Committee (ESDC) was held 20-21 February 2000 at the Royal Institution in London. Among the members of the Committee, only one was unable to attend; in addition, Professor Joshua Jortner, IUPAC's Immediate Past President, was present for the first day of the meeting. The ESDC Chairman, Professor P W Atkins (Lincoln College, Oxford, England, OX1 3DR, UK; E-mail: peter.atkins@lincoln.ox.ac.uk), has provided the following letter. Please pass it along to your colleagues who may have an interest in educational matters.

The Committee on Teaching Chemistry (CTC) has had a long and honorable history under a sequence of inspired and enthusiastic chairmen. It has done notable work in fields springing from its original interests, which lie in the general domain of secondary education, and its work has been extended to include tertiary education, too. Its notable successes lie in its contribution to the furthering of chemistry education in developing countries, with its provision of access to inexpensive equipment, small-scale procedures, and printed resources.

As part of its general strategic development, the Bureau has decided that the time has come for IUPAC to examine its educational role, and particularly the role of the CTC, in the modern world, to encourage the CTC to broaden its horizons, to engage in a wider range of activities, and to consider its direction afresh. To that end, it has set up a committee, the Education Strategy Development Committee (ESDC), under my chairmanship. The members of the committee come from a wide range of countries and represent a variety of interests. The terms of reference of the ESDC can be found on the IUPAC web site at http://www.iupac.org/organ/ad_hoc_cmt/education.html

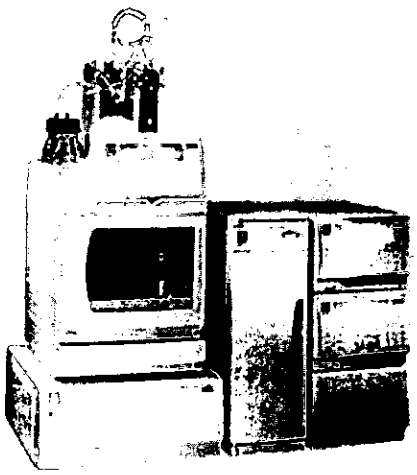
Broadly speaking, they encourage the committee to carry out a root-and-branch analysis of the current structure of the CTC and other contributors to the educational program of IUPAC, and to look for imaginative ways to extend its reach. In particular, the ESDC is asked to consider how to incorporate into IUPAC's activities support for the public understanding of chemistry. So far, the ESDC has had one meeting (at the Royal Institution in London, arguably the historical home of public understanding of chemistry). It quickly became clear at the meeting that there was one task we had to do if we were to compile a worthwhile report; we had to discover what the members of IUPAC wanted. There are already numerous educational initiatives under way throughout the world, and the ESDC wanted to avoid replication, inappropriate expenditure of effort, and—to express it directly—the treading on of toes. What is there that's special about IUPAC that can lead it to make a useful, effective, and welcome contribution to chemical education throughout the world? Which of its current activities are wasteful of volunteers' enthusiasm and effort?

In an attempt to gather our stakeholders' views, I have written to a large number of organisations. However, I know that lurking in the world are numerous good ideas. I am, therefore, using the pages of this journal to encourage anyone who has a view to write to me. I am particularly interested in imaginative *global* visions. An idea for developing an inexpensive synchrotron storage ring, reusable litmus paper, or whatever, can wait until the newly constituted CTC (if that is our recommendation) is in place; what the committee seeks are *strategic* ideas. Where should IUPAC's educational effort be directed? Where is its current effort wasted? How can it best reach the people who will benefit from its activities? How can IUPAC's activities mesh helpfully and constructively into the infrastructure of national and individual initiatives? Where should it step aside? Where would it be most welcome? Is there a role for IUPAC in contributing to the public understanding of science? How do we deploy the new media? What new media should we anticipate?

In considering these questions (and others like them), we have in mind two sets of slices through our stakeholders. One set divides our constituency into three horizontal bands: secondary education, tertiary education, and the general public (to cover public understanding of chemistry). The second way of dividing up our domain is into the developed world, the developing world, and global issues. We are aware, for instance, that in some developed countries, there is a worrying drift away from science and from chemistry in particular. In developing countries, the principal object of concern is perhaps the expansion of the technological base through education. The most obvious global issues are the protection and reclamation of the environment and the encouragement of sustainable development. Views on any aspect of our task—or entirely different ways of approaching the problem—would be most welcome.

The committee is already working hard on a number of issues that we have identified. It will meet again in July 2000, when it hopes to be able to work toward compiling at least an interim report. That report will be infinitely more valuable if it includes ideas that reflect what the world really wants rather than what we think it needs. Please do write to me, or pass on your comments to other members of the committee (see the web site).

THE NEW BIOLC SYSTEM PROVIDES HIGHLY SPECIFIC DETERMINATIONS OF BIOMOLECULES



Ai Scientific is pleased to introduce the new Dionex BioLC® System for powerful, high-specificity separation and quantification of biological molecules. The BioLC System is useful in the determination of: amino acids and simple sugars in one run without pre- or post-column derivatisation; proteins and peptides that differ by as little as one amino acid; nucleic acids that differ by as little as one base; and small biomolecules.

This broad range of applications is made possible by configuring the BioLC with any of three low-noise detectors: the ED50 Electrochemical Detector, PDA-100 Photodiode Array Detector, and AD25 Absorbance Detector. Never before have laboratories in the biotechnology, pharmaceutical, food and beverage, and nutriceutical industries had such a powerful tool for HPLC. The BioLC overcomes limitations of other HPLC systems by using inert, metal- free, polyetheretherketone (PEEK) flow paths and modular design. With PEEK construction, chemists have the freedom to choose the best buffers required for their separations.

BioLC also features a new low delay volume quarternary gradient pump, the GS50, and a high precision autosampler, the AS50. When the BioLC is used with Dionex's powerful new PeakNet™ 6 chromatography data management software, "System Wellness" features remind the user when to re-calibrate the instrument and automatically records calibration results, greatly simplifying audits.

Calibration and maintenance reminders save precious hours that may otherwise be wasted running an improperly calibrated instrument.

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NEW SELECTAPORE C_{18} COLUMN BROCHURE FOR PHARMACEUTICAL ANALYSES

Ai Scientific is pleased to announce the release of the Dionex SelectaPore™ C_{18} columns for pharmaceutical analyses. The new SelectaPore C_{18} columns are designed for small molecule separations. The SelectaPore columns are available in three varieties with differences in retention and selectivity to provide flexibility for small molecule methods development. These options include: 90 Å pore size with monomeric C_{18}, 300 Å pore size with monomeric C_{18}, and 300 Å pore size with polymeric C_{18}. All SelectaPore C_{18} columns are stable and produce highly reproducible separations.

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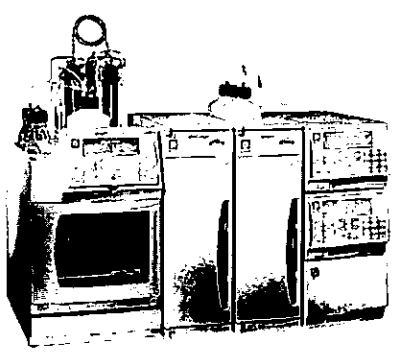
INTRODUCTION OF DX-600: NEW IC PERFORMANCE BREAKTHROUGH



Ai Scientific is pleased to introduce the highest performance ion chromatograph: the DX-600 IC System from Dionex. The DX-600 features technologically advanced pumps, columns, suppressors, detectors and "Just Add Water" technology. All instruments are controlled with PeakNet™ 6, the most powerful data management software available. With this combination of hardware and software, the DX-600 ensures the highest level of sensitivity and reproducibility, and the lowest noise for isocratic and gradient IC. No other IC system offers this level of performance, flexibility, and dependability. Whether running IC for environmental, food/beverage, pharmaceutical, semiconductor and electronics, or power applications, chemists using the DX-600 can generate chromatographic data with minimal effort and maximum reliability. DX-600 System Wellness reminds you when to re-calibrate instruments and automatically records calibration results, which greatly simplifies audits. By reminding the user when to re-calibrate modules, System Wellness saves precious hours that may otherwise be wasted running an improperly calibrated instrument.

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NEW AS14A FAST ANION-EXCHANGE COLUMN, AS14A ELUENT CONCENTRATE, AND SEVEN ANION STANDARD

Dionex Corporation has introduced the IonPac® AS14A column which uses a new, small diameter resin for fast, isocratic separation of inorganic anions. This carbonate-selective column is available in two formats: AS14A-5µm (3 x 150 mm) for faster run times, and AS14A-7µm (4 x 250 mm) for higher capacity applications and complex matrices. The high-efficiency AS14A-5µm 3-mm provides faster run times for common anions (3 x 150 mm), a two-fold reduction in eluent consumption, ultra-fast analyses of less than 5 minutes, and 2-3 times greater sensitivity compared to the 2-mm and 4-mm columns. The IonPac AS14A column meets US EPA Method 300 (A) requirements and directly replaces all IonPac AS4A, AS4A- SC, and AS14 applications. Specifically, it can be used to analyse anions including fluoride, acetate, chloride, nitrite, bromide, nitrate, carbonate, sulfate, and phosphate in diverse matrices such as drinking water, wastewater, industrial cooling water, scrubber solutions, acid rain, foods and beverages, and polymers.

The AS14A's selectivity distinguishes it from other columns, providing excellent retention of fluoride away from the water dip with elution of highly retained analytes such as sulfate in less than 8 minutes (3 x 150 mm format) or 13 minutes (4 x 250 mm format) using an 8.0 mM carbonate/1.0 mM bicarbonate eluent. Dionex also introduces the new AS14A Eluent Concentrate, a 100X concentrate for the AS14A column that contains 0.80 M carbonate/0.1 M bicarbonate. The concentrate is ready to use after dilution with deionised water, saving time and eliminating inaccurate eluent preparation and contamination. Dionex's new Seven Anion Standard for inorganic anion analysis is a great complement to the AS14A column. It is a ready-to-dilute calibration standard containing fluoride (20 mg/L), chloride (30 mg/L), nitrite (100 mg/L), bromide (100 mg/L), nitrate (100 mg/L), phosphate (150 mg/L), and sulfate (150 mg/L). This standard is shipped with complete NIST-traceable quality assurance data; concentrations are verified by two independent methods.

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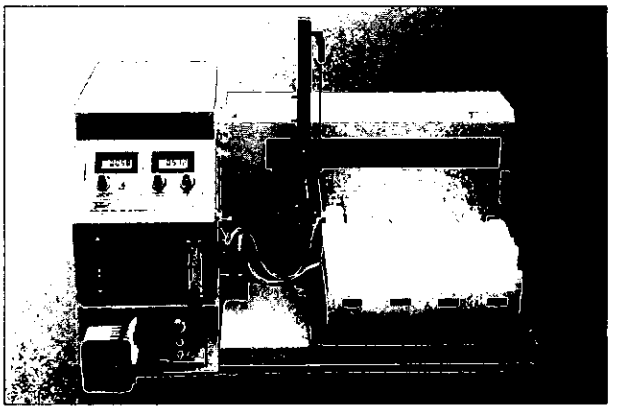
NEW MERCURY ANALYSER COMPLIANT WITH EPA METHODS 1631 AND 245.7



Ai Scientific is proud to announce the release of the Tekran® Series 2600 system for the analysis of ultra-trace levels of total mercury in liquid samples. It offers unparalleled sensitivity and flexibility for those who require truly sensitive total mercury analysis. The instrument is capable of providing a fully automated implementation of the new US EPA Method 1631. This method is capable of measuring waters with a detection limit of much less than the required < 0.5 ng/L (ppt). Unlike conventional systems, the Series 2600 is available in a wide range of configurations, with options to suit various applications.

The system can perform virtually any type of ultra-trace total mercury analysis and provides greater sensitivity, selectivity and dynamic range than atomic absorption-based systems. The Tekran Series 2600 works with stannous chloride or sodium borohydride reduction. Series 2600 modules can be interconnected by the end user, allowing easy migration from a starter system to a fully automated, high throughput configuration.

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HIGH-PURITY SILICA GEL COLUMN ENABLES HIGH-QUALITY ANALYSIS OF NEUTRAL, ACIDIC AND BASIC COMPOUNDS

Ai Scientific announces the release of Varian's OmniSpher™ 5 C18 Universal Column, a new generation, truly universal RPLC (Reverse Phase Liquid Chromatography) column for analysis of neutral, polar, acidic, and basic compounds. The OmniSpher 5 C18 relies on new column material, a high-purity silica gel composed of 5-micron spherical particles, making it ideal for the separation of small and medium molecular weight components.

The OmniSpher C18 demonstrates exceptional quality in clinical, pharmaceutical, environmental, and food applications including the analysis of antidepressants, antiepileptics, heterocyclic amines and anilines, organic acids, food constituents, preservatives, and flavanoids. The new column is synthesised to obtain a uniform stationary phase and high ligand density of 3.5 μmol/m^2 and a carbon loading of 20%. In addition, the pre-packed columns show an excellent efficiency of over 80,000 plates per meter.

Acidic, polar, and basic compounds elute from the column producing symmetrical peaks, without additives being used in the mobile phase, and maintain excellent reproducibility. The column also enables high-speed separations and LC-MS analysis without losing column separation power.

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RAPID-MS™ FROM VARIAN, INC. BOOSTS GC/MS PRODUCTIVITY UP TO 10 FOLD

Ai Scientific is pleased to announce the release of Varian, Inc.'s Rapid-MS™. This technology combines a breakthrough in capillary column technology with the stable high-vacuum environment of the Saturn 2000 Ion Trap GC/MS, and provides up to 10 times faster analysis with no compromise in data quality.

The Rapid-MS technology increases sample throughput significantly, with a corresponding decrease in operational costs. The technology is suitable for every GC/MS analysis - monitoring, screening, and confirmation - in industries ranging from basic chemicals to environmental to pharmaceutical. The patent-pending Rapid-MS™ technology uses a new concept of low-pressure gas chromatography (separation process under partial vacuum) but still allows standard GC injector operation at positive inlet pressures. The Rapid-MS™ technology carries forth Varian, Inc.'s ion trap GC/MS innovation and price/performance leadership. For more than 10 years, Varian, Inc. has used the ion trap GC/MS platform to extend the range of applications far beyond that normally available on benchtop instruments.

The capillary column technology that Varian, Inc. acquired with Chrompack is key to the decrease in GC/MS analysis times. The Saturn 2000 consists of three principal hardware modules: a workhorse Varian Model 3800 GC; a simply designed yet exquisitely sensitive ion trap mass spectrometer; and a powerful Saturn computer workstation with a full Windows® software interface. Rapid-MS™ technology is available with new Saturn 2000 instruments and as an upgrade to existing Saturn 2000's equipped with electronic flow control. In addition to Rapid-MS™ technology, the Saturn 2000 can also be outfitted with the recently introduced 100-sample CP-8400 AutoSampler and the new high-performance 1177 split/splitless injector for the ultimate in GC/MS productivity and unattended operation.

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CEM MARS5 FOR MICROWAVE SYNTHESIS

Ai Scientific is pleased to announce the release of the CEM MARS5 microwave specifically designed for the synthesis laboratory. The unit may be used for organic and inorganic synthesis including "solvent-free" organic synthesis and hydrothermal synthesis. The potential benefits include reduced reaction times, improved yields and purity, as well as pathway simplification, which are of considerable value to the synthetic chemist.

The system is up to 100 times faster than conventional methods, easy-to-operate and offers the flexibility to use existing glassware in a variety of sizes including:

- microplates
- 15 mL vessels
- 50 mL vessels
- 100 mL closed vessels
- 0.5-3 L round-bottom flasks

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MMS NIR - A STURDY SPECTRAL SENSOR FOR PROCESS ANALYSIS IN THE NEAR-INFRARED RANGE

The new MMS NIR sensor upgrades the Carl Zeiss series of MMS spectral sensors for the near-infrared range. This opens up a multitude of optimisation possibilities for production processes, e.g. in the fields of petrochemistry

and food analysis. Featuring a compact and sturdy design, the sensor is highly flexible and very reasonably priced in comparison to earlier systems. Its remarkable reliability and accuracy set a new milestone in process analysis technology. It is now possible to perform reliable in-process and shop-floor measurements, e.g. humidity or molecular analyses.

Like the MMS 1, the NIR spectral sensors consist of a solid quartz body to which a fibre shape converter and a InGaAs diode array are permanently connected, and which also directly carries the immovable imaging flat field grating. This technology yields extremely high reproducibility with respect to both the wavelengths and intensity information. The image-corrected and NIR-blazed grating, the large aperture and the shape converting technique results in high light intensity.

The module can be equipped with different diode arrays, depending on the spectral range requirements. The most budget-priced solution - an uncooled standard InGaAs array with 128 pixels covers the range from 0.9 to 1.7 nm. Using a cooled "extended" InGaAs array, the spectrum can be determined from 0.9 to 2.4 μm. Pixel dispersion totals approximately 6 nm, resulting in a spectral resolution of better than 20 nm. This makes the spectrometer module ideal for the identification of OH-like absorption bands. The wavelength reproducibility is better than 1 nm.

The integrated preamplifier provides simple control and selection of the sensor modules. Light is coupled via a fibre bundle equipped with an SMA connector.

Contact: Carl Zeiss (NZ) Ltd
9-15 Davis Crescent, Newmarket, Auckland
Phone: (09) 5205626, Fax: (09) 5205619
Suite 2, 7 Ward Street, Lower Hutt
Phone: (04) 5667601, Fax: (04) 5667501
Email: info@zeiss.com.au
Website: http://www.zeiss.de
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R&D SEPARATIONS RELEASES NEW PUREFIT MODULAR SYSTEM BROCHURE

R&D Separations, first to introduce the all metal cartridge model gas purifier to the gas chromatography market, releases their latest innovation in gas purification, the new PureFit Modular System. A turn-key gas purification, distribution, and control package all-in-one. PureFit is capable of providing a purified gas supply to multiple instruments from a single gas source, while maintaining an orderly and systematic solution to gas management.

PureFit utilises ultra high purity, mega capacity purifiers for the effective removal of oxygen, water, hydrocarbons, carbon dioxide, carbon monoxide and other organics from gases commonly employed in gas chromatography. PureFit Modular Systems are available with 1/4-inch inlet/outlet connections.

PureFit can save money on the cost of GC gases. In fact, a PureFit System can pay for itself in less than one year. One pays for purifications and saves money in the process.

Contact: Barbara Bogue, J&W Scientific
91 Blue Ravine Road, Folsom, CA 95630, USA
Phone: (+1-916) 9857888, Fax: (+1-916) 9851101
Website: www.jandw.com
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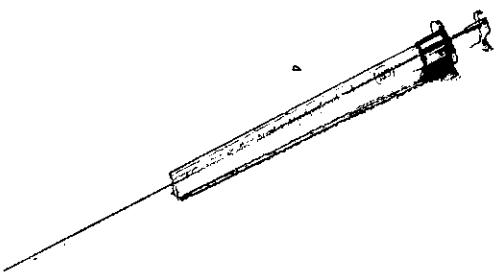
UNIMETRICS RELEASES BROCHURE FOR NEW AUTOSYRINGE



Unimetrics, manufacturer of syringes and syringe accessories for nearly 30 years, introduces the next wave of low cost, quality syringes. Now available are 10 μL standard barrel syringes compatible with the Agilent HP7673A Autosampler. Offered with 23, 26, and 23/26 dual gauge needles, these syringes are 100% compatible with the world's most popular GC instruments.

Also available is the 10 μL standard syringe compatible with earlier HP Autosamplers and many autosamplers from other manufacturers.

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MKS MAKES AVAILABLE NEW LITERATURE ON ORION COMPACT QUADRUPOLE MASS SPECTROMETER SYSTEMS

MKS Instruments Inc., has published colour brochures describing its new Orion Compact quadrupole mass spectrometer systems. Brochures are available for the new Orion CompactRGA, CompactPVD, CompactCVD, and CompactETCH process monitoring systems, that describe the systems and their related applications and benefits. The brochures also list the operating specifications and ordering information.

The Orion Compact mass spectrometers comprise a family of residual gas and process gas analysis systems that integrate control electronics into one on-board unit, saving space and simplifying installation. They are designed for specific applications that can benefit from a residual gas analysis or process monitoring capability - from ultra-high vacuum to atmospheric pressure - including semiconductor and thin-film processes, such as plasma etching, chemical vapour deposition, evaporation or sputter deposition, and rapid thermal processing.

Contact: MKS Instruments Inc.
Phone: (+1-800) 2778766, Fax: (+1-978) 9750267
Website: http://www.mksinst.com
circle number 32 on the reader reply card

NEW VARIAN CARY 384-WELL MICROPLATE READER FOR COMBINATORIAL ANALYSES

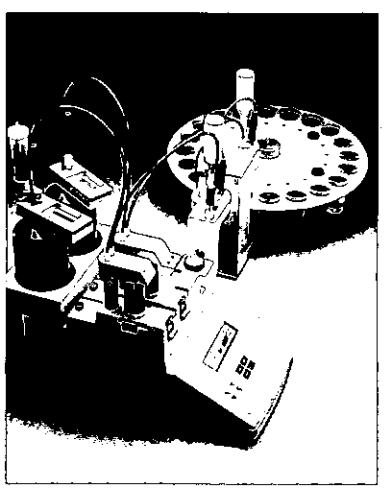
Varian, Inc introduced a 384-well microplate reader as an accessory for its Cary Fluorescence Spectrophotometer at the recent 2000 Pittsburgh Conference. Designed for combinatorial chemistry analyses in life science and pharmaceutical laboratories, the Cary microplate reader offers the highest throughput available without compromising sensitivity.

The Varian microplate reader can measure up to 384 wells incorporating reflective optics to focus the light on each well. As a result, there is little loss in transmission, unlike designs that use optical fibres. The microplate reader can measure difficult samples quickly and accurately. Measurement flexibility allows wavelength scans with a minimum resolution of 1.5 nm, kinetics, and single-intensity readings. Customised measurement capabilities are also available.

The microplate reader is an important accessory for the Cary Fluorescence Spectrophotometer, the first truly new mid-range fluorescence instrument in more than 10 years. The affordable Cary Fluorescence Spectrophotometer combines the latest advances in electronics and software technology with 50 years of the Cary products' quality and performance. Fluorescence spectroscopy is used increasingly for a number of fast growing life science applications. These include combinatorial chemistry, molecular probes, and DNA thermal denaturation/ renaturation. The speed and sensitivity of the Cary is ideal for these measurements.

Contact: Mark Albertson
A.i. Scientific (NZ) Ltd
P O Box 35579, Browns Bay, Auckland
Phone: (09) 4781351, Fax: (09) 4781360
Email: aiscinz@ihug.co.nz
circle number 33 on the reader reply card

TITRATION MADE EASY FROM METTLER



METTLER TOLEDO has introduced a new Titrator targeted at users who need a compact, easy to use, but powerful titration solution for the laboratory or the near process environment: The DL50 Graphix.

The DL50 Graphix has been designed to make every step in automatic titration as simple and elegant as possible:

The large back-lit screen enhances communication with the user. It displays messages in clear plain language (5 languages selectable) and provides the user with excellent feedback on the instrument's actions.

When it comes to establishing a new analysis, the unique LEARN TITRATION function helps in finding the best titration parameters automatically. There is no need for the user to learn all the theory behind it. Titrants, sensors and calculation formulas can be selected from existing lists. The user is never required to type in any cryptic codes! For the definition of names for methods, operators etc, any PC compatible keyboard can be connected.

During titration, the signal curve may be displayed in real-time, giving the user a visual confirmation that everything is proceeding as planned. After the titration is finished, you get a printed report containing all the information that is required, including answers to questions such as where, when, by whom and with what the analysis was done. The printout therefore provides full compliance with all regulatory bodies.

When it comes to additional manual functions, pictogram-keys allow direct and simple access to functions like dispensing, stirring and pH measurement.

The DL50 Graphix can be connected to a balance, a sample changer, a standard parallel or serial printer, the compact METTLER TOLEDO GA42 printer, to a personal computer (by using optional METTLER TOLEDO DLWin software) and, via a PC keyboard, to a barcode reader.

Contact: John Small, Medic Scientific
Medic Corporation Ltd, Phone: 0800 50 80 70
circle number 34 on the reader reply card

PERKINELMER 2000 TRAINING COURSES

Sample Preparation, Flow Injection Atomic Spectrometry, Atomic Absorption Spectrometry, ICP Emission Spectrometry, ICP Mass Spectrometry, Thermal Analysis, FTIR & NIR Spectroscopy, UV/Visible Spectroscopy, Fluorescence Spectroscopy, Gas Chromatography, GC/MS, Valved GC for Refinery & Natural Gas, and Liquid Chromatography.

Teaching people to accomplish more with our products has been a PerkinElmer endeavor marked by continuing changes – in instruments, teaching facilities, instruction methods and other elements reflecting our technological progress.

With every new innovation we have aimed to improve the benefits enjoyed by our students. We are proud of the results. Attendees tell us they learn more in a few hours than in weeks of work with instruments on their own.

us. Networking with other students, for example in solving problems, the hands-on experience gained in a laboratory situation with the latest equipment can be an invaluable faculty.

This is the broadest international program of its kind, operated by the leading manufacturer of analytical equipment. Training courses are conveniently offered in Melbourne, Sydney, Auckland, Perth and Brisbane. This gives you a degree of accessibility that saves time, travel, and expense.

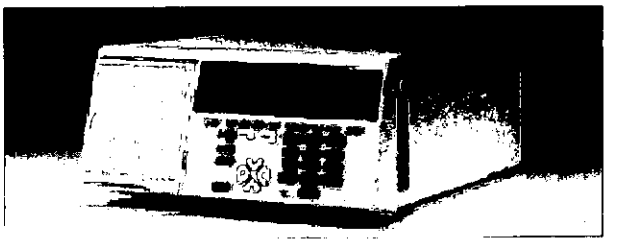
PerkinElmer also offer a range of customised courses. If you don't see a course that fits your needs, but would like to combine aspects of one or more, call us about tailoring an onsite course to meet your specific needs.

Classrooms and laboratories have the most modern facilities, including such instructional aids as computers, dual-screen projection, LCD projection panels, and video. We keep the classes small to maximise hands-on use of the equipment and to encourage your interaction with the faculty. Students are accepted on a first-come, first-served basis.

To receive a copy of the PerkinElmer Atomic Spectrometry or Spectroscopy/Chromatography Training Course brochure,

Contact: Laurence Van Dam, NZ Scientific Ltd
Free Phone: 0800 776767, Free Fax: 0800 776000
Internet address: http://www.perkinelmer.com
E-mail: perkin-elmer@clear.net.nz
circle number 35 on the reader reply card

NEW PERKINELMER SERIES 200 UV/VISIBLE DETECTOR



The new Series 200 UV/Vis Detector from PerkinElmer is the worthy successor to the most popular UV/visible detector in history - the Model 785A. Relying on nearly 15 years of experience and continuous improvement, the Series 200 continues the tradition of superior detector performance and quality set by such well respected detectors as the 785A, 759A and 757.

High sensitivity, stability, flexibility, and reliability are features you'd expect from the Series 200 UV/Vis detector - and add to that an ergonomic, fully stackable design, a

- and add to that an ergonomic, fully stackable design, a large, easy to read display and direct digital output of data for easy connectivity to Turbochrom! You can even view the chromatogram in real-time on the detector display - ensuring your chromatographic performance without having to go back to your data system!

The detector offers an outstanding and real-world proven noise and drift specification (< +/- $1x10^{-5}$ AU noise, <$1X10^{-4}$ AU/hr drift) along with performance in the 190 to 700 nm range when using the optional tungsten lamp for visible wavelengths. The tungsten lamp offers true visible performance and eliminates the issue of low deuterium lamp energies or second order interference in the visible - for increased confidence in your analyses!

Complete wavelength programming capabilities - via the detector keypad or through Turbochrom control allows for optimum performance and flexibility during the analysis!

Contact: Laurence Van Dam, NZ Scientific Ltd
Free Phone: 0800 776 767, Free Fax: 0800 776 000
Internet address: http://www.perkinelmer.com
e-mail: perkin-elmer@clear.net.nz
circle number 36 on the reader reply card

NEW CARBOPAC PA1, PA10, AND PA-100 2 MM MICROBORE COLUMNS FOR CARBOHYDRATE SEPARATIONS

Ai Scientific is pleased to introduce the Dionex CarboPac™ PA1, PA10, and PA-100 series columns in the microbore 2 mm x 250 mm format for carbohydrate determinations using amperometric detection.

Resin selectivity and particle size are identical for both 2 mm and 4 mm anion exchange columns. Benefits of the 2 mm microbore format include: direct transfer of 4 mm applications, lower eluent consumption, and equivalent sensitivity to 4 mm operation. The CarboPac series columns are designed to address a wide range of carbohydrate applications. The CarboPac PA1 column is a rugged, all purpose column suitable for the analysis of monosaccharides and disaccharides in a wide variety of matrices. The CarboPac PA10 column is designed for the analysis of neutral, acidic, and amino monosaccharides found in glycoproteins. The CarboPac PA-100 is an optimised high resolution column for the separation of neutral and charged oligosaccharides and linear polysaccharides.

Contact: Mark Albertson, A.i. Scientific (NZ) Ltd
P O Box 35579, Browns Bay, Auckland
Phone: (09) 4781351, Fax: (09) 4781360
Email: aiscinz@ihug.co.nz
circle number 37 on the reader reply card

LAB SOLUTIONS SOFTWARE FOR GC/MSAND LC/MS

Shimadzu Scientific Instruments has introduced Lab Solutions software for their GCMS-QP5000 series, the QP-8000 LC/MS and the new LCMS prepSTAR preparative LC/MS. Lab Solutions software is extremely easy to operate and can enable all types of users to maximise the full potential of their system quickly and efficiently. All setup and quantitative functions can be performed on one screen and a compound table wizard leads the user through the process. Lab Solutions software allows control of all parameters including customised applications throughout method development, instrument operation, and data processing. The page layout functions for the report generator allow complete customisation of printed results.

Contact: Shimadzu Scientific Instruments
PO Box 45 077, Auckland 1230
Free Phone: 0800 12 SHIM (0800 12 7446)
Fax: (09) 8367757, Website: www.shimadzu.com.au
circle number 38 on the reader reply card

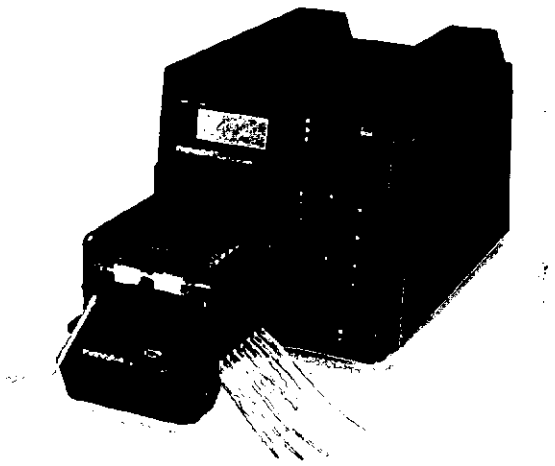
HIGH PERFORMANCE BENCHTOP LC/MS FROM SHIMADZU

Shimadzu Scientific Instruments has introduced the new versatile LCMS-QP8000α Liquid Chromatograph/ Mass Spectrometer which puts enhanced quantitative and qualitative resolving power of LC/MS onto the laboratory bench. Designed to be a routine LC detector for the Shimadzu VP Series HPLC, the compact, affordable LCMS-QP8000α provides greater sensitivity than previous models. Enhanced features include ramping voltages that improve sensitivity and provide a more uniform response for ions over a wide range of masses plus the ability to tune on a mixture of calibration standards to provide the best performance over a wide mass range The LCMS-QP8000α is rugged, easy-to-operate and extremely easy to maintain. The orthogonal, directly-heated capillary design provides excellent desolvation and reliability. The easily changed electrospray and APCI interfaces enhance flexibility for use in a wide range of HPLC applications.

New Lab Solutions LC/MS 32-bit software for Windows® provides single point control for the entire LC/MS system. The software features control of multi-channel UV and PDA detectors, and the ability to acquire data from other detectors as well. The page layout functions for the report generator allow complete customisation of printed results. Comprehensive validation functions including audit trail facilitate GLP/GMP compliance.

Contact: Shimadzu Scientific Instruments
PO Box 45 077, Auckland 1230.
Free Phone: 0800 12 SHIM (0800 12 7446)
Fax: (09) 8367757, Website: www.shimadzu.com.au
circle number 39 on the reader reply card

NEW CARTER RANGE OF CASSETTE PUMPS



Barnant Company has introduced the Carter family of multi-channel cassette tubing pumps for a wide range of laboratory and process applications. There are three modes of pump operation available: flow, timed flow and programmable cycle dispensing. There are six pump configurations to choose from with available pumping channels ranging from 2 to 12 to meet most applications with a flow range from 3 microlitres per minute per channel up to 760 ml/min per channel.

Carter multi-channel pumps feature a large digital display which provides the operator with visual display of pump speed in rpm, percentage of maximum speed and the number of dispensed cycles. Features include remote input/output control of pump speed and pumping direction, start/stop/purge functions and all pumps are reversible for purging.

The drive units comprise a 74 watt motor with 3.5 to 200 rpm range and 0.25% accuracy at full speed in an IP:23 enclosure and all models are supplied for 230 volt, single phase, 50 Hz power. Additional cassettes and a wide assortment of compatible tubing are available separately to suit a wide range of applications.

Contact: Ian McEwen, Pump Systems Ltd
Phone: (03) 3661858, Fax: (03) 3666769
Email: ianm@pumpsystems.co.nz
circle number 40 on the reader reply card

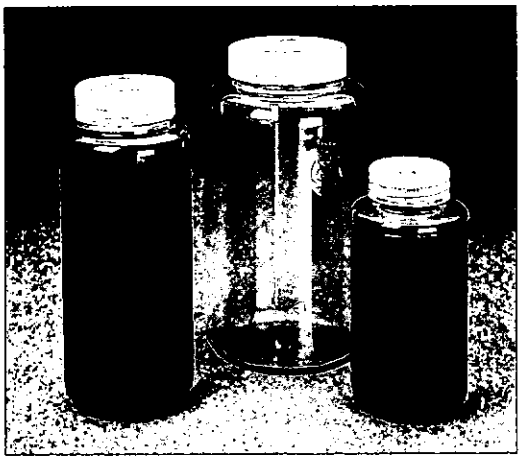
FULLY AUTOMATED PREPARATIVE LC/MS FROM SHIMADZU

Shimadzu Scientific Instruments has introduced the LCMS prepSTAR Preparative LC/MS which features real-time mass directed fraction collection in a fully automated system. The prepSTAR is a complete system including all HPLC components, valves, splitters, and fraction collector needed to separate, detect and collect target compounds in preparative HPLC. The LCMS prepSTAR has been optimised to collect fast peaks and to perform "heart cut" peak collection based on detected masses. Peaks can also be collected based on threshold, peak height or slope.

The highly flexible LCMS prepSTAR pumps can readily deliver analytical to preparative flow rates from 0.1 – 150 mL/min. Valve switching from analytical to preparative and fraction collection is automatically controlled. Each peak is tracked and all fractions are reported to ensure accurate fraction identification.

Contact Chris Nipper Ph: (09) 836 7752 or Bruce Fraser Ph: (03) 545 6016 at Shimadzu, Fax (09) 836 7757 or email sales@shimadzu.co.nz
circle number 41 on the reader reply card

STRONG AND RIGID NALGENE CENTRIFUGE BOTTLES ARE RATED FOR 27,500 X g



Manufactured of strong, transparent, rigid polycarbonate, Nalgene Centrifuge Bottles from Nalge Nunc International are autoclavable and provide excellent mechanical strength. When used wiwth polyproylene sealing caps they provide leakproof service for up to 27,500 x g on hazardous materials, and are available in 250 mL, 500 mL and 1000 mL nominal capacities.

Nalgene Sealing Cap Assemblies and Nalgene Centrifuge Bottle Adapters are available for use with designated manufacturer's rotors. Nalgene Centrifuge Bottles are also available in polypropylene copolymer, Telfon FEP.

Contact: NNI Documentation Centre, Sevenoaks
Kent TN14 5XA, England, United Kingdom
Fax: +44 (0) 1732 453166
Website: www.nalgenunic.com
circle number 42 on the reader reply card

14-18 June 2000
Challenges for Science and Engineering in the 21st Century
Venue: Stockholm, Sweden
Contact: Dr John Peet, Department of Chemical & Process Engineering, University of Canterbury
Private Bag 4800, Christchurch, New Zealand
Tel: (+64-3)-3642538, Fax: (+64-3)-3642063
Email: j.peet@cape.canterbury.ac.nz
Website: www.cape.canterbury.ac.nz/people/njp/njp.htm

20-21 June 2000
Pharma 2000: Engineering and Technology for the 21st Century
Venue: Nottingham, United Kingdom
Contact: W Dew, Conferences and Courses, IchemE
169-189 Railway Terrace, Rugby CV21 3HQ
United Kingdom
Tel: (+44-1788)-578214, Fax: (+44-1788)-577182
Email: wdew@icheme.org.uk

26-28 June 2000
Pharma R&D Directions 2000
Venue: Barcelona, Spain
Contact: Tracy Moring, Marketing Manager, ECPI
QAiC Worldwide, Second Floor, 100 Hatton Garden,
London EC1N 8NX, United Kingdom
Tel: (+44-171)-8275977, Fax: (+44-171)-2421508,
Email: ecpi@aic-uk.com
Website: www.ecpi-online.com

1-5 July 2000
13th International Conference on Organic Synthesis
Venue: Warsaw, Poland
Contact: Professor M Chmielewski, Institute of Organic Chemistry, Kasprzaka 44, 01-224 Warsaw 42
P O Box 58, Poland
Tel: (+48-22)-6318788, Fax: (+48-22)-6326681
Email: ichos@ichf.edu.pl

2-7 July 2000
Conasta 2000
National Conference of The Science Teachers' Association of Australia
Venue: Perth, Western Australia
Contact: Website: www.stawa.asn.au/conasta2000.html

3-6 July 2000
University of Waikato/Amersham Pharmacia Biotech Protein Purification Course
Venue: Hamilton, New Zealand
Contact: R McGowan, Centre for Continuing Education
University of Waikato, Private Bag 3105
Hamilton, New Zealand
Email: rmcgowan@waikato.ac.nz
Website: www.mape.waikato.ac.nz/courses/522.htm

9-14 July 2000
34th International Conference on Coordination Chemistry
Venue: Edinburgh, Scotland, United Kingdom
Contact: Professor P Tasker, Chairman; Dr John F Gibson, Secretary, The Royal Society of Chemistry
Burlington House, London W1V 0BN
England, United Kingdom
Tel: (+44-171)-4403321, Fax: (+44-171)-7341227
Email: gibsonj@rsc.org

9-14 July 2000
38th International Symposium on Macromolecules
Venue: Warsaw, Poland
Contact: Professor Stanislaw Penczek, Polish Academy of Sciences, ul. Sienkiewicza 112, 90363 Lodz, Poland
Tel: (+48-42)-6819815, Fax: (+48-42)-6847126
Email: speczek@bilbo.cbmm.lodz.pl

9-12 July 2000
Chemeca 2000: Opportunities and Challenges for the Resource and Processing Industries
Venue: Perth, Western Australia
Contact: Conference Secretariat, Chemeca 2000
C/O Congress West Pty Ltd, P O Box 1248
West Perth, WA 6872, Australia

17-20 July 2000
40th Microsymposium on Polymers In Medicine
Venue: Prague, Czech Republic
Contact: Dr Jaromir Lukas, Institute of Macromolecular Chemistry, Academy of Sciences of the Czech Republic
Heyovskeho na. 2, 162 06 Praha 6, Czech Republic
Tel: (+420-2)-360341, Fax: (+420-2)-367981
Email: sympo@imc.cas.cz

6-11 August 2000
16th IUPAC Conference on Chemical Thermodynamics
Venue: Halifax, Nova Scotia, Canada
Contact: Dr Peter G Kusalik, Department of Chemistry
Dalhousie University, Halifax
Nova Scotia B3H 4J3, Canada
Tel: (+1-902)-4943627, Fax: (+1-902)-4941310
Email: kusalik@is.dal.ca

6-11 August 2000
7th International Symposium on Polymer Electrolytes
Venue: Noosa, Queensland, Australia
Contact: Dr Astrid Nordmann, Centre for Advanced Materials Technology, Monash University
Wellington Road, Clayton, VIC 3168, Australia
Tel: (+61-3)-99055791, Fax: (+61-3)-99054998
Email: ispe7@eng.monash.edu.au
Website: www.chem.monash.edu.au/electrolytes/ispe7

14-18 August 2000
12th International Conference on Thermal Analysis and Calorimetry
Venue: Copenhagen, Denmark
Contact: Dr O Toft Sorensen
Risoe National Laboratory
Tel: (+45-4)-6775800, Fax: (+45-4)-6775758
Email: o.toft.sorensen@risoe.dk

14-18 August 2000
Drug Discovery Technology 2000
Venue: Boston, USA
Contact: Website: http://www.drugdisc.com

15-19 August 2000
17th Annual Meeting of the International Society of Chemical Ecology
Venue: Pocos de Caldas, Minas Gerais, Brazil
Contact: Evaldo F Vileda
Tel: (+55-31)-8913204, Fax: (+55-31)-8913911
Email: evaldovilela@insecta.ufv.br

20-25 August 2000
XIIIth International Congress on Rheology
Venue: Cambridge, England, United Kingdom
Contact: Dr D M Binding
Fax: (+45-1970)-622777
Email: rheology2000@aber.ac.uk

1 September 2000
22nd International Symposium on the Chemistry of Natural Products
Venue: Sao Paulo, Brazil
Contact: Dr M Fatima das G F da Silva, Universidade Federal de Sao Carlos, Depto. de Quimica, Via Washington Luiz km 235, CP676, Sao Carlos, Brazil
Tel: (+55-16)-2748208, Fax: (+55-16)-2748350
Email: dmfs@power.ufscar.br

3-8 September 2000
ICHC 2000, XIth International Congress of Histochemistry and Cytochemistry
Venue: York, England, United Kingdom
Contact: Royal Microscopical Society
37/38 St Clements, Oxford OX4 1AJ, United Kingdom
Tel: (+44-1865)-248768, Fax: (+44-1865)-791237
Email: info@rms.org.uk, Website: www.rms.org.uk

3-8 September 2000
11th International Biotechnology Symposium
Contact: Professor G Kreysa, DECHEMA eV
C/O 11th IBS, Theodor-Heuss-Allee 25
60486 Frankfurt/Main, Germany
Tel: (+49-69)-7564205, Fax: (+49-69)-7564201
Email: info@dechema.de

10-15 September 2000
9th International Magnesium Symposium
Venue: Vichy, France
Contact: Y Rayssiguier, INRA
Clermont-Ferrand - Thiex
F-63122 Saint-Genes-Champanelle, France
Fax: (+33-4)-73624638
Email: mag2000@clermont.inra.fr
Website: http://www.inra.fr/clermont/mag2000

10-15 September 2000
XXth International Conference on Polyphenols
Venue: Freising-Weihenstephan, Germany
Contact: Professor Dr G Forkmann, Chair of Floriculture and Horticultural Plant Breeding
Technical University Munich
D-85350 Freising-Weihenstephan, Germany
Fax: (+49-81)-61713886
Email: d.treutter@lrz.tum.de

11-14 September 2000
21st International Federation of The Societies of Cosmetic Chemists
Venue: Berlin, Germany
Contact: DGK Secretariat, Konrad-Zirkel-Str 22
D-97769 Bad Bruckenau, Germany
Tel: (+49-9)-7414323, Fax: (+49-9)-7413934
Email: dgk.ev@t-online.de

19-22 September 2000
5th International Chemical Industry Fair
Venue: Beijing, China

26-28 September 2000
World Vaccine Congress 2000
Venue: Paris, France
Contact: T Moring, ECPI, AiC Worldwide Ltd
100 Hatton Garden, London ECIN 8NX
United Kingdom
Tel: (+44-20)-78275977, Fax: (+44-20)-72421508
Email: ecpi@aic-uk.com

1-5 October 2000
7th International Symposium on Selenium in Biology and Medicine
Venue: Venice, Italy
Contact: Professor Fulvio Ursini
Department of Biological Chemistry
viale G Colombo 3, I-35121 Padova, Italy
Fax: (+39-49)-8073310

7-10 October 2000
NZIFST/MIRINZ Joint Conference 2000: Horizons MM! - Designing Foods That Consumers Will Choose.
This conference will run concurrently with Xpo's Food

Tech 2000, Pack Tech 2000 and Massey Food Awards.
Contact: Julie Watson, Swift NZ Ltd
P O Box 27056, Mount Roskill, Auckland
Tel: (+64-9)-6256169, Fax: (+64-9)-6256655
Email: jwatson@im.aust.com

8-10 November 2000
2nd International Symposium on Food Packaging - Ensuring the Safety and Quality of Food
Venue: Vienna, Austria
Contact: Dr L Contor, ILSI Europe, 83, Avenue E. Mounier, Box 6, B-1200, Brussels, Belgium
Tel: (+32-2)-7620044, Fax: (+32-2)-7710014
Email: laura@ilsieurope.be

19-22 November 2000
Corrosion & Prevention 2000
Venue: Hyatt Hotel, Auckland, New Zealand
Contact: Corrosion Prevention Centre
P O Box 2340 Mount Waverley, VIC 3149, Australia
Tel: (+61-3)-98095266, Fax: (+61-3)-98095344
Email: corrprev@internex.com.au

3-8 December 2000
Soil 2000: 2nd Joint New Zealand and Australian Soil Science Societies Conference
Venue: Lincoln University, Canterbury, New Zealand
Contact: Helen Shrewsbury
P O Box 84 Lincoln University
Christchurch, New Zealand
Tel: (+64-3)-3252811 ext 8955, Fax: (+64-3)-3253840
Email: shrewsbh@lincoln.ac.nz

9-13 December 2000
Poly Millennium 2000
Venue: Hilton Waikoloa Village, Waikoloa, Hawaii
Contact: William H Daly, Department of Chemistry
Louisiana State University, USA
Email: bill.daly@chem.lsu.edu

14-19 December 2000
Pacifichem 2000
Venue: Waikiki, Honolulu, Hawaii
Contact: Professor B Halton, Department of Chemistry
Victoria University of Wellington
P O Box 600 Wellington, New Zealand
Fax: (+64-4)-4955241
Email: brian.halton@vuw.ac.nz

19-20 January 2001
Chem Expo India 2001
Venue: Mumbai, India

16-20 May 2001
8th Symposium of the European Society for the Study of Purine and Pyrimidine Metabolism in Man
Venue: Bruges, Belgium
Contact: Professor G Van den Berghe, Metabolic Research Group, Christian de Duve Institute of Cellular Pathology (ICP) and Universite Catholique de Louvain Avenue Hippocrate 75/39, B-1200 Brussels, Belgium
Fax: (+32-2)-7647598

19-21 June 2001
10th Loss Prevention and Safety Promotion in the Process Industries Conference
Venue: Stockholm, Sweden

1-6 July 2001
World Chemistry Congress
Venue: Brisbane
The congress comprimises the 38th IUPAC Scientific Congress ("Frontiers in Chemistry") together with the 9th Asian Chemical Congress and AIMECSO1, the biannual meetings of the Federation of Asian Chemical Societies and the Asian Federation of Medical Chemistry respectively.

26 August - 1 September 2001
XXXIV International Congress of Physiological Sciences "From Molecule to Malody"
Venue: Christchurch, New Zealand
Contact: The Conference Company
P O Box 90040, Auckland, New Zealand
Tel: (+64-9)-3601240, Fax: (+64-9)-3601242
Email: info@tcc.co.nz

NEW ZEALAND INSTITUTE OF CHEMISTRY

NZIC COUNCIL NEWS

NZIC PRIZES

The winners of the 1999 NZIC prizes will be profiled in the next issue of *Chemistry in New Zealand.*

Nominations are called for the 2000 NZIC Prizes:

SGS Prize
This prize of NZ$1,000 and a plaque has been donated by SGS (New Zealand) Ltd. The prize shall be awarded to a member of the Institute who, in the opinion of the Council, has made a significant contribution to some branch of chemical science, the contribution to be judged by research work published during the five years immediately preceding 30th April in the year of the award.

Applications by members or nominations which may be submitted by Branch Committees, or individual members must be received by the NZIC Office , New Zealand Institute of Chemistry, PO Box 39283, Howick, Auckland, by the 30th June 2000 and must be accompanied by copies of papers presented in support of the entry.

FERNZ Prize for Industrial and Applied Chemistry
A prize of $1,000 and a certificate will be awarded annually by FERNZ Corporation Ltd. to further the recipient's studies in industrial chemistry and to commemorate the achievement. The prize will be awarded for meritorious achievement in the field of industrial or applied chemistry.

The prize will be restricted to financial members of the New Zealand Institute of Chemistry of any grade of membership. In the case of joint work the prize may be shared between two or more members.

Applications should include a written statement of the industrial or applied chemistry activities or achievements of the candidate(s) and their significance in terms of improved technology, new products or other benefits to industry or the community. Supporting documents and publications may be submitted with the application and will be held confidential to the assessors. If possible, the value of the work should be attested by an accompanying statement from the manager or directors or head of the organisation. There is no limit on the period of time over which the work was carried out.

Individual members may make applications for the prize or nominations may be made by Branch committees.

Applications or nominations must be received by the NZIC Office, New Zealand Institute of Chemistry, PO Box 39283, Howick, Aucklamd, by the 30th June 2000.

NZIC Award for Chemical Education
The award of NZ$250 shall be made to a person who, in the opinion of Council, has made an important contribution to chemical education in New Zealand. (Note: the award will normally be made to a secondary teacher actively involved in teaching chemistry.)

The award is not restricted to financial members of the Institute. Individuals may make application for the award, or nominations may be made by any Branch committee or by any individual financial member of the Institute.

Applications or nominations must be received by the NZIC Office, New Zealand Institute of Chemistry, PO Box 39283, Howick, Auckland, by the 30th June 2000. Each application or nomination must include a full curriculum vitae and two independent supporting statements from referees commenting on the educational activities of the candidate and their significance to chemical education.

The Arthur C Kennett Memorial Award
An award sponsored by the Australian Corrosion Association and the New Zealand Institute of Chemistry as a memorial to Mr A C Kennett, a very active member of both organisations.

The subject matter of any paper to be considered for the award must cover the key aspects of "corrosion" and "non-metallics", and should materially add to the knowledge of corrosion mitigation for non-metallics, and/or the use of non-metallics in corrosion mitigation. This implies that the paper should have scientitific value.

For a paper to be eligible for consideration it must have been presented at a technical meeting, seminar, symposium or conference run under the auspices of either of the sponsors of the award, solely or jointly with another learned organisation, or published in either of the journals of the sponsoring bodies during the 12 months ending June 30th of the year in which the award is made.

The author(s) does (do) not necessarily have to be a member of either of the sponsoring organisations but should be a citizen of either Australia or New Zealand.

Application forms are available from the Corrosion Prevention Centre, Melbourne, or through Branch Secretaries of ACA and NZIC.

The completed application form, together with the text of the paper and a synopsis, is to be sent to the Corrosion Prevention Centre, PO Box 2340, Mount Waverley, Victoria 3149, Australia no later than 30 September 2000.

Become a member of the NZIC Now!

REPORT OF THE NZIC COUNCIL MEETING 14 APRIL 2000

The NZIC Council for 2000 is:

President:
Professor Keith Hunter, University of Otago
1st Vice President:
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Dr Gordon Rewcastle, Auckland School of Medicine
Waikato Delegate:
Dr Pat Holland, HortResearch
Manawatu Delegate:
Professor Andrew Brodie, Massey University
Wellington Delegate:
Professor John Spencer, Victoria University
Canterbury Delegate:
Dr Jonathan Morris, University of Canterbury
Otago Delegate:
Professor Keith Hunter, University of Otago

The council met at the University of Canterbury and the points raised at the meeting are summarised below. Contact your branch delegate or Grant Boston (Secretary@nzic.org.nz) for a copy of the minutes.

Financial Report
Rob Whitney presented the provisional 1999 Financial Report. The final result was a deficit of $7,103. However, loans to both the 1999 NZIC Conference, and *Chemical Processes in New Zealand* are due to be repaid soon and this will improve the situation.

Rob tendered his resignation, which was accepted with a unanimous vote of thanks. Rob will stand down in November. Dr Colin Freeman, University of Canterbury has agreed to take his place.

Membership Report
Council welcomed the following 36 new members to the NZIC:

Auckland

Rinaldo Azzara	
Vinod Patel	SGS
Darren R Handforth	SGS
Wei-Te Chen	
Peter Slijp	Drew NZ Ltd
Mark Stuart Jones	Industrial Research Ltd
Grant Allen	Student
Sharlene Peterson	Student
Daniel Furkert	Student
Yu Huay Michelle Lai	Student
Profesor Margaret Brimble	University of Auckland

Waikato

Colin Malcolm	HortResearch
Tanra Trower	HortResearch
Tracey Adams	Student
Sadiq Al-Haidar	Student
Rebecca Cheatley	Student
Stefan Hill	Student
Natalie Panova	Student
Kathleen Paterson	Student

Manawatu

Chris Hillmer	Taranaki Nuchem Ltd
Barry Scott	BDH Chemicals (NZ) Ltd
Alexandra Park	Student

Wellington

Stephen Bagshaw	Industrial Research Limited
Carissa Jones	Student
Lyndon West	Student

Canterbury

Mr Richard Rendle	
Sie-Ping Ting	
Scott Bringans	Student
Sean Devenish	Student
Warren Maclean	Student
Andrew Rea	Student
Gregory Smith	Student
Michael Townsend	Student

Otago

Helen Palmer	University of Otago
Oliver Hutt	Student

Overseas
Dr Vaughan Langford University of Western Australia

Members Lost
The death of Mr D W Lockhart FNZIC, Otago, was reported.

Resignations

Auckland
Dr D J McLennan FNZIC
Mr F G Komen MNZIC
Mr G C Brent MNZIC
Mr H S Ayling MNZIC
Miss L S Roberts MNZIC
Miss S Kinnon MNZIC

Waikato
Mr L A Campbell MNZIC
Dr B S W Dawson MNZIC
Dr P A Watson MNZIC

Manawatu
Mr K R Lockhart MNZIC
Dr W J Belcher MNZIC
Mrs G Sivalingam-Reid MNZIC

Wellington
Mr J C Wallaart FNZIC

Mr D B Adams MNZIC
Dr T Kemmitt MNZIC
Dr D G McGavin MNZIC
Dr A Falshaw MNZIC
Mr W D Gooley MNZIC

Canterbury
Ms R Johnson MNZIC
Mrs L Bull MNZIC
Ms S Meade MNZIC
Ms A R Wilkinson MNZIC
Mr M A Bond FNZIC

Otago
Mr M J R Halstead MNZIC
Ms C McLean MNZIC
Mr N R Harrison MNZIC

Overseas
Professor R M Allen

Overdue Subscriptions
Grant Boston reported that 205 members were a year or more overdue in payment of their subscription and should be suspended from membership under Rule 7. Council was concerned at the high numbers and asked Branches to examine the names of these people and report back to Grant.

Council moved to accept these resignations and suspensions by the end of June 2000 contingent on reports from branches.

Fellow of the NZIC
Council welcomed Professor Ian Shaw FRSC as a Fellow of the NZIC.

Special Funding Requests
The Council approved the following requests:

$2200 to the Wellington Branch for the Secondary Schools project.
$550 to the Waikato branch for the 2000 National Crystal Growing Competition.
$2000 to the Graham Townsend, Canterbury, for the development and production of a "Careers in chemistry" poster series.
$1000 Manawatu Branch to develop an online careers database.

Reports
Reports of the following NZIC activities were received:

1999 Chem Olympiad
Year 13 Chemistry Exams
Pacifichem 2000
Chem NZ
New Zealand is Different
Chemical Education Trust
NZIC Conference 2001
Chemistry in New Zealand

Easterfield Medal
The Royal Society of Chemistry have proposed that the winner of the Easterfield Medal will travel to the UK to present their work at Royal Society meetings. In exchange a RSC Corday Morgan Award winner will travel to New Zealand to present their work. The RSC and NZIC would pay travel costs to and within their respective countries.

Council agreed to the proposal. The 1999 Easterfield Medal winner will travel to the UK this year and a Corday Morgan Award winner will travel to NZ in 2001.

Grant Boston, Honorary General Secretary.

BRANCH NEWS

AUCKLAND

The new committee for 2000 is:

Chair: Associate Professor Gordon Rewcastle, Auckland Cancer Society Research Centre
Secretary: Dr Jadranka Travas-Sejdic, Pacific Lithium Ltd
Treasurer: Dr Michael Fitzpatrick, Kingett Mitchell

Committee:
Dr Alistair Bingham, JCL Air and Environment
Mr Alan Grout, University of Auckland
Associate Professor Al Nielson, Massey University, Albany Campus
Associate Professor John Packer, University of Auckland

Student Representative: Mr Shen Chong University of Auckland (PhD student)

Council Delegate: Gordon Rewcastle
This is Gordon's second time on the committee, but first as Chairman. He obtained his PhD in Organic Chemistry from The University of Auckland in 1978, and after postdoctoral experience in the United States, he joined the Cancer Society's Research Laboratory at the Auckland Medical School in 1980, where he has remained ever since. The laboratory has now integrated with the University of Auckland to become the Auckland Cancer Society Research Centre, and although the name may have changed, the nature of the work involved, namely anti-cancer drug development, has not. He has been a member of the New Zealand Institute of Chemistry since 1980, and served as Treasurer of the Auckland Branch in 1984 and 1985. He was elected a Fellow of the Institute in 1988 and was awarded the NZIC/Royal Society of Chemistry Easterfield Medal at the 1989 NZIC Conference in Hamilton. His full address is:
Associate Professor Gordon Rewcastle
Auckland Cancer Society Research Centre
Faculty of Medical and Health Sciences
The University of Auckland
Private Bag 92019, Auckland
Phone: 373-7599 ext 6147, Fax: 373-7502
Email: g.rewcastle@auckland.ac.nz

The first Branch meeting of 2000 was on Wednesday 29 March 2000. The speaker was Professor D M P (Mike) Mingos FRS, University of Auckland Foundation Fellow, Principal of St. Edmunds Hall, Oxford University, and until recently Dean of the Royal College of Science and Sir Edward Frankland BP Professor of Inorganic Chemistry, Department of Chemistry, Imperial College of Science, Technology and Medicine, University of London. The title of his talk was "Going for Gold." Professor Mingos' principle areas of research are in the fields of organometallic and coordination chemistry, gold and platinum chemistry, theoretical and structural chemistry and the development of microwave techniques for chemical syntheses. In the area of gold chemistry he was responsible for the synthesis and structural characterisation of the first example of an icosahedral gold cluster compound, as well as the first example of a gold cluster with a crown geometry. Recently, examples of both gold-platinum and gold-rhodium cluster compounds were synthesised by his research group. While at the University he gave four other lectures including two on using microwaves in chemical synthesis.

Other recent and future activities included a visit to Pacific Lithium Ltd on 25 May 2000, and a talk by Professor Terry Collins, Carnegie Mellon University, Pittsburgh, "Green Chemistry: Sustaining a High Technology Civilisation". Last year Terry Collins was awarded President Bill Clinton's Green Chemistry Challenge Award, the highest US award for environmentally-friendly science.

Recently the Royal Society of New Zealand held a meeting in Auckland to explore science activities in the greater Auckland region, with the view to making science activities more visible and relevant in the region. It was decided to initiate programmes centred around the theme "Urban Sustainability". The Auckland Branch is keen to play its part in this promotion of science in Auckland, and sees Terry Collin's lecture as very appropriate to this theme. Thus this lecture will also be promoted as a lecture of the Auckland Museum Institute (the Auckland Branch of the RSNZ) and of the Auckland Science Teachers' Association.

WAIKATO

The Waikato Branch kicked off the year in style with a well-attended barbeque held at the University grounds. It was great to see the range of people from local CRI staff, University staff and a good turn out of postgraduate and undergraduate students. Naturally, being the Waikato, it was very sunny and a perfect evening to enjoy Tony Cartner's cooking skills. The Branch is grateful to the School of Science & Technology at the University of Waikato for allowing the use of facilities.

Keith Hunter, NZIC President for 2000, entertained a select group with a talk about the control of CO_2. Keith outlined the nature of the CO_2 problem including an overview of the debate surrounding global warming. His table showing the output of carbon per person for each of the countries was rather alarming; the point that the bulk of the world's population has yet to match the developed nations output of carbon dioxide starkly illustrated the potential impact of uncontrolled emissions and added considerable poignancy to the arguments for action to control or remove CO_2. Keith outlined some control strategies and he spoke about the deposition of liquid CO_2 in ocean depths at some length. The dramatic video illustrating the deposition of liquid CO_2 at great depth was fascinating. Keith also took the opportunity to discuss future trends for the funding of branches. This is clearly an important issue for all NZIC branches and the Waikato Branch will discuss the issue in detail at the next Committee meeting. The Waikato Branch wishes to express appreciation to Keith for a stimulating talk.

University news centred on research: beginning and ending. A pleasing number of MSc students began at Waikato this year in contrast to low numbers last year. A number of these involve joint projects with industry and CRI partners and represent a new trend in research activity for the Department. Meto Lynch (pictured) recently graduated with his PhD and chose a marae-based graduation. Meto is the first Maori to graduate with a doctorate in chemistry and only the second Maori to graduate with a PhD in science from the School of Science & Technology, University of Waikato. Meto presently works for Crop and Food Research within the Plant Extracts Research Unit based at the University of Otago.

***Above:** Meto Lynch at the recent marae graduation ceremony.*

On the less positive side the Chemistry Department experienced a number of health and safety incidents recently. One, a fire that originated in a refrigerator, caused considerable damage. The exact cause has not been determined but it seems to have been either some butyl lithium or an electrical fault in the refrigerator. The Department has inspected all refrigerators used for chemical storage and upgraded a number of them. The second incident involved a helium dewar used for the high-field NMR. The dewar developed a frozen plug blocking the outlet. Confusion over the risks involved and lack of communication with the suppliers necessitated an evacuation of the School. The dewar was eventually punctured by the bomb squad in spectacular fashion. The Department now understands that the occurrence of such plugs is common and recommends that users of liquid helium dewars contact suppliers to obtain the appropriate protocol for handling such events.

Upcoming events include the now annual ChemQuest, a fun mastermind type competition for sixth formers, and a repeat of the national crystal growing competition that Bill Henderson ran so successfully as part of International Chemistry Week last year. The Branch is grateful to the NZIC Council for providing Bill with funding to run the competition. We will also be running our highly popular and successful Analytical Chemistry Competition for seventh formers from the Waikato region, which is supported by the Waikato Branch financially.

The Waikato Branch notes with regret the death of Pat Lester, a member of long standing and wishes to express sympathy to his family and friends.

Richard Coll
Branch President

MANAWATU

Snippets

* Professor Andrew Brodie was awarded the degree of Doctor of Science at the May Massey University Graduation ceremony.

* Manawatu Branch members were recently hosted by Dr Neil Walker at Kiwi's Whareroa site where they were given a presentation outlining Kiwi's sites and activities. This was followed by a tour of the various factories highlighting much of Kiwi's impressive manufacturing technology.

* Dr Lawrie Creamer FNZIC has been awarded the 1999 R J Scott Medal by the Royal Society of New Zealand.

* Dr Darren Englebretsen has been awarded a Senior Research Fellowship from the Wellcome Trust for 5years. The total package is in the vicinity of $500,000 and includes equipment and his salary for 5 years.

Massey University Chemistry News

Massey Chemistry Professor Conferred with Doctor of Science

Massey University Professor Chemistry Andrew Brodie has come a long way since his first schoolboy experimental forays into chemistry, burning holes in his mother's aluminium saucepans with caustic soda.

Professor Brodie was conferred with the prestigious Doctor of Science degree at Massey University's third graduation ceremony on Tuesday, May 16.

The Doctor of Science is conferred on people who have made outstanding contributions to their research fields. The degree generally requires the recipient to have published at least 100 research papers and to be acknowledged as an international authority. Before the DSc is awarded, three overseas peers review the papers and decide whether the degree is deserved.

Professor Brodie, aged 55, says he became hooked on chemistry as a third former at the new Cashmere High School in Christchurch. "I still remember the experiment. We heated blue hydrated copper sulfate, and watched it turn white as it dehydrated. It was like magic. I discovered then that I enjoyed chemistry more than any other subject."

Later that year, he learned more about the need to think about equipment before proceeding to experiment. At school he had dissolved aluminium in concentrated sodium hydroxide. It seemed like a good idea to repeat the experiment at home when he found some more caustic soda, kept for unblocking drains.

"So I took one of my mother's aluminium saucepans, tipped a pile of hydroxide pellets into it and added a little water. Horrors! After much fizzing and frothing, the saucepan developed a hole. I hid it, my mother found it and is probably still puzzled about how it happened."

He survived these chemical mishaps, going on to do a BSc(Hons) at the University of Canterbury, then a PhD, finishing in 1968. Job prospects were good for scientists in those days.

"As graduate students then, we were optimistic about the future as it was a time of expansion in the universities and the now-extinct Department of Industrial and Scientific Research was employing good people on long-term contracts."

He went on to a postdoctoral fellowship at the University College of London, then came to Massey University in 1970 to take up a lectureship. "The starting salary for a lecturer then was $3500," he recollects.

Professor Brodie's work during his 30 years so far spent at Massey University laid the foundations for teaching and research for inorganic chemistry. Much of his work has been done in collaborations with other scientists, especially Associate Professor Eric Ainscough, also of Massey University.

The emphasis of his research has been on the synthesis of new materials containing transition metals and the subsequent examination of their properties and behaviours.

Professor Brodie is a Fellow of the Royal Society of Chemistry (London) and the New Zealand Institute of Chemistry. He is currently the Professor of Chemistry in Massey University's Institute of Fundamental Sciences.

New Faces
Massey University Chemistry is very pleased to have Dr Carol Taylor join the staff. Carol has come from the University of Auckland where she studied for her BSc and MSc degrees. Then she went to the University of Pennsylvania where she completed a PhD in 1993 followed by postdoctoral work at Princeton University before returning to Auckland in 1995 as a lecturer in Chemistry. Carol's research involves the design, synthesis and evaluation of molecules with interesting biological activities. For example she has synthesised a decapeptide

derived form the adhesive protein, Mefp1, produced by marine mussels which allows them to stick to surfaces in turbulent waters.

More Achievement
Dr Darren Englebretsen has been awarded a Senior Research Fellowship from the Wellcome Trust for 5years. The total package is in the vicinity of $500,000 and includes equipment and his salary for 5 years.

News From New Zealand Dairy Research Institute (NZDRI)

Long-standing member Dr Lawrie Creamer FNZIC has been awarded the 1999 R J Scott Medal by the Royal Society of New Zealand. Lawrie is a distinguished scientist working in the Food Science Section of NZDRI. The award recognises Lawrie's 37-year contribution to milk protein chemistry. Early in his career, Lawrie was a pioneer in the development of industrial applications of casein. Later Lawrie worked to define the compositional parameters for high quality cheddar and helped show how they could be controlled during cheese manufacture.

In 1984 he received the Miles Marshall International Award from the American Dairy Science Association and he was the first person from outside of North America to serve on the Editorial Board of the *Journal of Dairy Science*.

His recent study of the movement of water within young cheese earned him an award at the 1998 International Dairy Federation Congress in Denmark. Currently he is the science leader of the NZDRI's protein structure research team.

Dr Cory Bystrom joined the Food Science Section of NZDRI in March. He is interested in structure/function relationships in proteins and will be applying molecular biology and protein chemistry techniques in his research.

Dr Marlena Kruger from the University of Pretoria has joined the Microbiology, Nutrition and Enzyme Science Section of NZDRI. Her expertise is in the area of bone physiology and health.

Professor Youn-ho Hong from Chonnan National University, Korea is a visiting research worker at NZDRI who will work on β-lactoglobulin structure for the next 12 months.

Brian Brooker, latterly of the University of Reading and now a consultant to the food industry is visiting NZDRI to work in the area of food microstructure and it's application to food systems research.

Skelte Anema and Siew Kim Lee have left NZDRI for a year to work with Professor Kostermeyer at the Dairy & Food Research Institute at the Technical University of Munich.

NZIC May Meeting
The May meeting of the Manawatu Branch, which was combined with a Chemistry Teachers' meeting, began with a visit to the new Food Industry Science Centre at Crop and Food Research Ltd. First we heard an overview of the role of the 8 different Crop and Food centres around the country and the one in Australia and then a talk by one of the scientists on using the technique of genetic engineering to develop different coloured pigments in flowers. We were split into two groups for a tour of the laboratories. The use of glass along the corridors gives a pleasant open feeling to the building which we will also have on the research level of the new Tower A at Massey University next year. One group visited the maize laboratory and discovered how to make corn twisties and other snacks. The other group visited the food chemistry laboratory. It was good to meet up with Erin O'Donoghue who completed a BSc(Hons) in chemistry from Massey University in 1983 and has done well in her career as a professional scientist. After a most pleasant dinner at Wharerata, which was an extremely valuable time for the teachers to network, we were entertained with a series of demonstrations put together by Dr Tony Wright and Patricia Shields. The teachers got copies of the experimental details so they can do them with their own classes. Finally Massey lecturer, Dr Emily Parker gave a very timely lecture - "Looking at Nature's Catalysts" – in which she cleverly linked her own research to the topic of chirality by giving examples the teachers could use in the classroom. It was a surprise to see a very young looking Trevor Kitson on video trying to make a kiwifruit jelly. The meeting was attended by more than 30 teachers from as far afield as Hawkes Bay and Wellington. The feedback was extremely positive and it is clear that these meetings are an extremely valuable link with the teachers. Tony Wright, Emily Parker and Patricia Shields are to be congratulated for organising such an interesting evening.

Jeremy Dombroski

OTAGO

The Chemistry Department, University of Otago was delighted with the success of no fewer than five of their 1999 Honours class in obtaining Bright Futures, Top Achiever Doctoral Scholarships in the inaugural round. Congratulations to Greg Halder, Geoff Kelso, James Mackintosh, Tim Robinson and Robyn Schofield. Geoff, Tim and James have already started PhD work in the Department.

We have had a number of comings and goings in the Chemistry Department. Recent visitors have included Professors Phil and Nancy Rieger from Brown University, Providence, Rhode Island; Professor Ray Jones from Loughborough University and Professor Alex McCauley from the University of Victoria, British Columbia. Ray was particularly impressed with the quality of wines available in this part of the world and sampled many during his short time here. John Wells, glassblower extraordinaire to the Chemistry Department, has had his expertise recognised through the award of a QEII scholarship to visit departments in the United Kingdom over a seven week period. During this time he will impart his glassblowing skills to his colleagues in the UK and will himself be

appraised of the latest glassblowing developments in that part of the world. Dr Alan Hayman and Dr Paul Addison have recently returned from sabbatical leaves in Switzerland and England respectively, while Dr Dave Larsen has started a period of sabbatical leave at Bristol. New faces within the department include Drs Duncan de Geest and Craig Depree, who are working as postdocs for Dr Sally Brooker, and Dr Meto Leach who is working in the Plant Extracts Research Unit.

Congratulations to Ross Grimmett on achieving notoriety for the CHEM141 course in the Anti-Calendar, recently published by the Otago University Students' Association. The CHEM141 paper was rated the third best lectured paper in a survey of all First Year papers in the University. It was rated the best of only two papers from the Division of Sciences to make the top ten best lectured papers. All of the others came from the Division of Humanities.

The Government's inaugural New Economy Research Fund has awarded a team of researchers led by Professor Brian Robinson and Dr Keith Gordon a grant of $300,000 per annum over the next 2 – 3 years. The research to be carried out is in the field of smart polymers; with an aim to develop materials that emit light and can be used in instrument displays and lighting. The research team includes scientists from both the Physics and Chemistry Departments and is run under the auspices of the "Innovation in Materials" research theme. Researchers hope to dope conducting polymers with a number of metal complexes. These complexes have emissive excited states with large Stokes shifts. This means that a single complex may be able to emit over a wide spectral range and that a number of such dyes could produce white-light emission from the polymer in which they are contained. Further NERF success for the Department came with Jim McQuillan's involvement in a proposal on 'Functional Interfaces' fronted by IRL with input from Jim and Phil Bremer from Food Science and Crop and Food. They got $500,000 of the $1.1 million requested.

Margaret Mills, Head of Department of Science at Queen's High School, has been awarded a Science, Maths and Technology Fellowship from the Royal Society of New Zealand to spend a year working at the University of Otago on a research project. The Government-funded award is designed to update the Fellow's knowledge of the subject(s) and careers in her chosen field, so that it can be brought back to the classroom. Margaret is being hosted by both the Geology and Chemistry Departments and her research project is entitled "Geochemistry: from rock to dump - the (re) cycling of earth resources." She plans to research the chemical processing of minerals used in everyday items, such as lightbulbs and cans, and then investigate whether the chemical components in these items can be recycled. One of the aims of the Fellowship is to communicate the outcomes of the project to the wider community and Margaret plans to do this in a variety of ways, including the production of resource materials for use in schools.

The NZIC divisional AGM was followed by a very successful tasting of local Emerson's beers, hosted by George Emerson and Russell Keast. These beers are one of Dunedin's best kept secrets and are well worth trying to get hold of. The President of the NZIC, Professor Keith Hunter, presented a thought-provoking lecture on the viability of storing excess CO_2 at the bottom of the ocean in an attempt to overcome global warming. However, he also expressed doubts about global warming and suggested that in fact a new ice age may be imminent! This was a well attended event which was preceded by a dinner at the Polytech restaurant.

Allan Blackman

IUPAC PRIZE FOR YOUNG CHEMISTS

The IUPAC Prize for Young Chemists has been established to encourage outstanding young research scientists at the beginning of their careers. The prize will be given for the most outstanding PhD thesis in the general area of the chemical sciences, as described in a 1000 word essay.

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Applications will be judged by a committee of eminent scientists appointed by the President of IUPAC.

Complete information, including application forms is available on the IUPAC website. The URL is: http://www.iupac.org/news/prize.html

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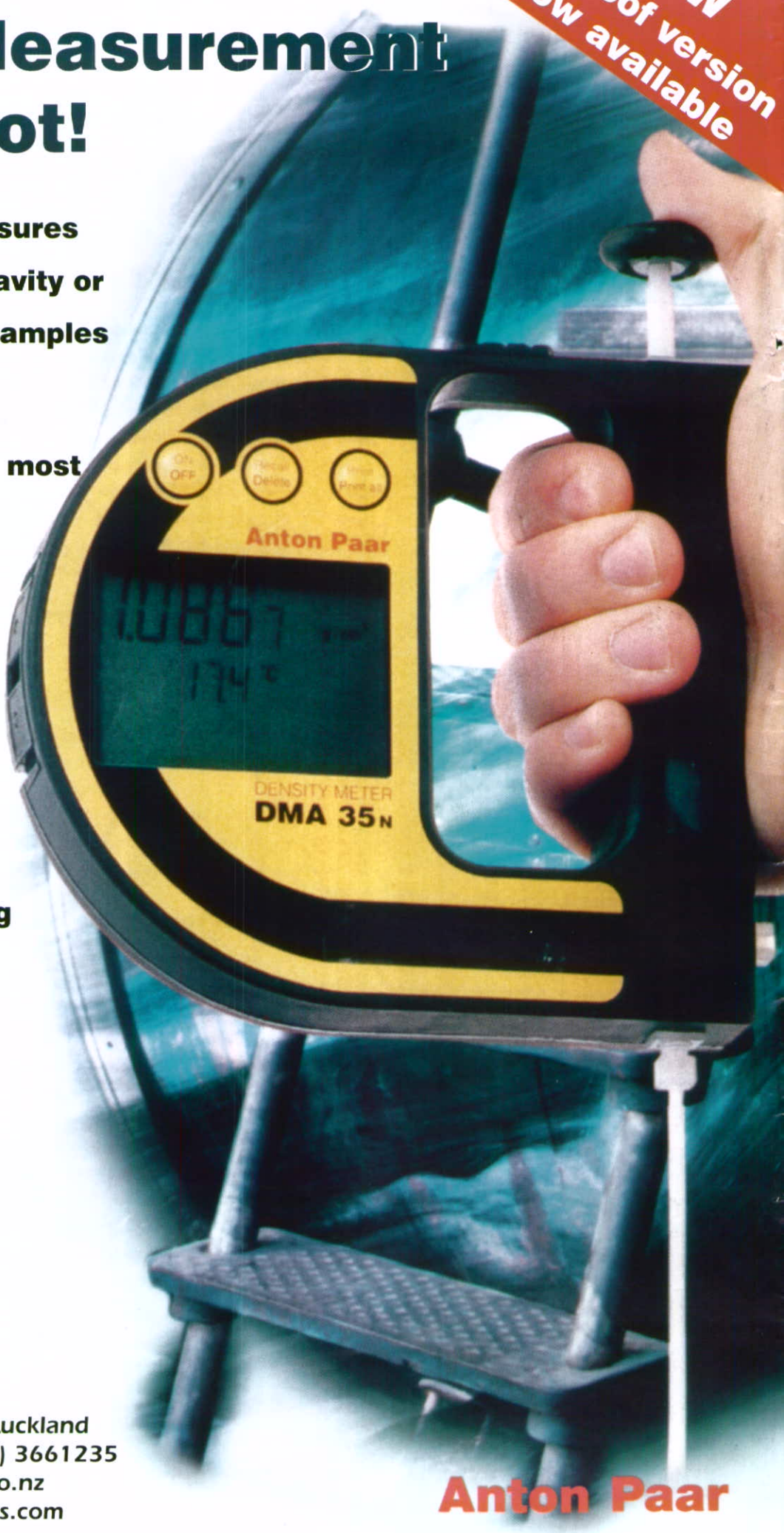

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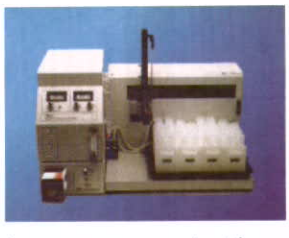

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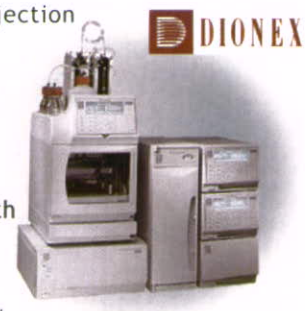

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Email: icp.oes@spectronz.co.nz

SPECTRO 200/200T

The SPECTRO 200/200T is the smallest of Spectro's energy dispersive X-ray fluorescence spectrometers. It is used mainly for special tasks such as the analysis of the important elements in crude oil, timber treatment, cement, or coatings. The display, keyboard and printer are incorporated into the instrument housing, making it robust and compact. An additional test probe can be connected to the instrument via a cable so that large samples and liquid flows can be analysed on site. Liquid, solid or powdered samples can be handled easily.

SPECTRO TITAN

The SPECTRO TITAN bridges the span between the durable benchtop gauge and the sophisticated lab grade instrument, with a foot in both camps. Featuring a 30kV, 9W programmable X-ray tube, proportional counter detector and Ross/Hull detector filters it offers unparalleled sensitivity, selectivity and precision compared with other instruments in its price range. An optional PIN photodiode SemiConductor Detector permits simultaneous determination of multiple adjacent elements. The ability to purge with either helium or nitrogen for optimal light element performance and a 12-position autosampler completes this very special instrument.

SPECTRO XEPOS

The SPECTRO XEPOS is a benchtop XRF Spectrometer designed for multi-element analyses that require high analytical performance. A so-called "Extended Polarisation Optical System" uniquely enables low powered tubes (50W) to be used as the radiation source for the simultaneous analysis of the elements ranging from sodium to uranium. For many applications, this instrument does away with the need to use filters with low radiation transmission, which means that the limits of detection achieved are significantly better than with conventional benchtop instruments. A sample changer and ability to handle different sized samples are features of this instrument.

SPECTRO X-LAB 2000

The SPECTRO X-LAB 2000 incorporates all SPECTRO'S experience and know-how in the field of polarised X-ray radiation. For X-ray fluorescence analyses that have to meet particularly high standards of analytical performance e.g. in the fields of production, research and environmental monitoring, the SPECTRO X-LAB 2000 is the ideal instrument. It owes its performance advantage to, among other things, a new technology that uses crystals to polarise the X-rays. This enables analyses of elements ranging from sodium to uranium to be made in 100 seconds; its special polarisation targets and excellent sensitivity enable detection limits at the ppm level to be achieved for the critical elements sodium, magnesium, aluminium, phosphorous, sulfur and chlorine.

SPECTRO ON-LINE

SPECTRO's ON-LINE XRF analysers, matched with custom software, allow control of processes in situations where previously infrequent, external, analysis provided the only means of control. Applications for SPECTRO ON-LINE analysers include; control of cement raw meal, control of sulfur content in crude oil and petroleum products, plating baths, coatings on a variety of substrates (phosphate on steel, silicon on paper).

XRF APPLICATIONS

A comprehensive library of XRF applications notes is available. Some of the areas covered include:

- *Ores, Slags & Ash*
- *Pharmaceuticals & Cosmetics*
- *Clays, Sands & Feldspars*
- *Textiles, Fibres & Papers*
- *Coating Analysis & Gauging*
- *Chemical Analysis*
- *Paints & Pigments*
- *Petroleum Products*
- *Plastics & Rubbers*
- *Metal Conversions*
- *Electroplating*
- *Foods & Beverages*
- *Cements & Concrete*
- *Wood Treatment & Preservation*
- *Alloys & Metal Sorting*
- *Environment & Hygiene*

SPECTRO
Analytical Instruments

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SPECTROFLAME ICPs

SPECTROFLAME ICPs are built around the simplest optical bench available – the Paschen Runge mounting and utilise fibre optic technology to transfer light to one or more spectrometer tanks. Spectro's gas-filled optic systems eliminate the requirement for contamination-prone vacuum systems or expensive, gas consuming purge systems. From a completely shut down to a fully operational state can take as little as 15 minutes. Spectro's patented optical plasma interface (OPI), on the axial view models, allows for examination of the analytically active zone of the plasma with a favourable signal-to-noise ratio. Above all there is no "cool" zone where recombined ions give rise to intensified background emissions that cancel out the advantages of axial observation. Two model styles are available ...

SPECTROFLAME MODULA

The SPECTROFLAME MODULA is a benchtop ICP spectrometer, of outstanding versatility, utilising photomultiplier detector technology. A spectrometer can be configured to meet any requirement; sequential, simultaneous/sequential, or wholly simultaneous. In addition all configurations are available with either axial or radial plasma viewing. Two wavelength range options are available; a 160 nm to 800 nm model, and a wider spectrum 120 nm to 800 nm model. The wavelengths below 160 nm provide virtually interference free access to a significant number of elements, including the halogens chlorine, bromine and iodine.

SPECTROFLAME CIROS

The SPECTROFLAME CIROS is a new generation ICP utilising charge coupled diode (CCD) detector technology. This instrument is simultaneous; providing analysis of 10,000 emission lines in 10 seconds. The huge dynamic range of the detector (10^8 counts per second), use of only first order wavelengths, and the linear detector array virtually eliminates "blooming", the curse of CCD systems. These features also give the CIROS the ability to determine, in the same sample, elemental concentrations that are vastly different (percents and ppb) with a single integration. Although exclusively an axial viewed plasma, utilising the patented OPI, instrument the CIROS is available in the same two wavelength configurations provided in the MODULA models. Other features include mass flow control of all gases and keyboard control of all accessories; autosampler, autodiluter, ultrasonic nebuliser and hydride generator.

REPLY FORM

For more information on Spectro Analytical products or applications please tick the appropriate box below and return this form by fax to Auckland (09) 4822967 or by post to Spectro Analytical NZ, P O Box 34789 Birkenhead, Auckland, New Zealand.

☐ XRF Spectrometers ☐ ICP Spectrometers ☐ ICP-MS Spectrometers

Name: ..... Company: .....

Department: ..... Telephone: .....

Fax: ..... Email: .....

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My Application(s) Is/Are: .....

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1. SURNAME: INITIALS: TITLE:

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DEPARTMENT:
ADDRESS:
TEL: FAX:
EMAIL:

2. YOUR FUNCTION (please tick)

- MANAGEMENT ☐
- RESEARCH/DEVELOPMENT ☐
- PRODUCTION ☐
- QA/QC ☐
- TEACHING ☐
- PURCHASING ☐
- CONSULTING/ADVISORY ☐
- OTHER (please specify) ☐

3. WHAT EQUIPMENT/TECHNIQUES DO YOU USE? (please tick)

GC/GC-MS	☐	HPLC/LC	☐
UV/VISIBLE SPECTROSCOPY	☐	FLUORESCENCE SPECTROSCOPY	☐
AA SPECTROSCOPY	☐	ICP, ICP-MS	☐
NMR	☐	POLYMERASE CHAIN REACTION	☐
THERMAL ANALYSIS	☐	FTIR/IR SPECTROSCOPY	☐
MICROSCOPY	☐	ELEMENTAL ANALYSIS	☐
pH/ELECTROCHEMISTRY	☐	PARTICLE SIZE ANALYSIS	☐
CENTRIFUGES	☐	MASS SPECTROSCOPY	☐
XRF or XRD	☐	OTHER (please specify)	☐

4. I WOULD LIKE TO KNOW MORE ABOUT BECOMING A MEMBER OF THE NEW ZEALAND INSTITUTE OF CHEMISTRY. PLEASE SEND ME DETAILS.

Please tick ☐

5. I AM INTERESTED IN FURTHER INFORMATION ON THE FOLLOWING NUMBERED PRODUCTS. (CIRCLE THE CORRESPONDING NUMBER FROM THE BASE OF THE ADVERTISEMENT OR ARTICLE)

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