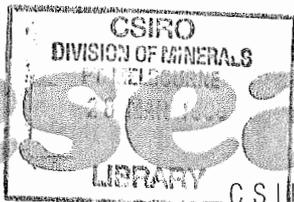


# CoResearch

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CSIRO's staff newspaper



## Research on anti-flu drug wins 1996 Australia Prize

BY DOUG GALE

Dr Peter Colman, Chief of CSIRO's Division of Biomolecular Engineering, has been awarded the 1996 Australia Prize.

Colman was a joint recipient of Australia's most prestigious science award for his work on the design and development of the world's first anti-influenza drug.

This is the third time that CSIRO scientists have received the Australia Prize.

The Australia Prize is an international award given by the Australian Government to researchers who have made outstanding contributions to science and technology promoting human welfare.

This year's prize honoured achievements in pharmaceutical design. It was presented by the Minister for Industry, Science and Technology, Senator Peter Cook, at a formal ceremony in Melbourne last month.

Dr Colman shares the \$300,000 award with Dr Graeme Laver from the Australian National University and Dr Mark von Itzstein from



Dr Peter Colman with Senator Peter Cook after the Australia Prize presentation: "There are many who have contributed to the project"

Monash University, who were both involved in the influenza work, and the international pharmaceutical developer, Belgium's Dr Paul Janssen.

The anti-influenza drug is based on research carried out by CSIRO dating back to 1978. Dr Colman's group in collaboration

with Dr Laver determined the structure of one of the influenza coat proteins involved in viral replication.

Dr Colman identified a strategic region of this protein that is invariant across all known influenza strains and recognised that this site was a potential

target for the development of an anti-influenza drug.

The drug was synthesised by Dr von Itzstein's group. It is effective in preventing laboratory influenza infection and in treating existing infections in humans.

Phase II clinical trials are in progress and market release is expected within three years. World-wide sales of more than \$1 billion a year are predicted for a successful drug, resulting in considerable royalties for CSIRO.

Dr Colman admitted that his approach was contrary to popular wisdom at the time he started the research.

"We believed that if a drug could be developed to block neuraminidase then possibly we could combat influenza once and for all," he said.

"Many people were sceptical of our approach. They offered many reasons why the drug angle would fail and reminded me of them often. However, we thought there were also some very good reasons why we should try a new approach and fortunately we were correct."

Dr Colman said that the commercialisation of his

research faced the same scepticism as the science. He paid tribute to Alan Woods, the founder of Biota Holdings Ltd, who believed in the concept long before it became accepted. Biota backed the research and involved Glaxo Australia in the subsequent development of the drug.

In accepting the award, Dr Colman recognised the contributions made by his CSIRO colleagues. "There are many who have contributed to the project, particularly Dr Jose Varghese, who has been working with me since 1981," he said.

He also acknowledged the support of CSIRO, which had backed the project before the prospects of a commercial outcome, the encouragement of his family and the contribution of Dr Wen-Yang Wu at the Victorian College of Pharmacy.

Peter Colman has been Chief of the Division of Biomolecular Engineering since 1989. His previous awards include the Inaugural Frederick White Prize of the Australian Academy of Science in 1984, the Inaugural CSIRO Medal in 1985 and the Burnet Medal in 1995.

## CSIRO on show at exhibition centre

BY CHRISTIAN PETERSON

Twelve Divisions joined forces to put CSIRO on show at the opening event at Victoria's new exhibition centre in February.

The exhibition, *Victoria on Show*, highlighted an array of Victorian inventiveness and achievements.

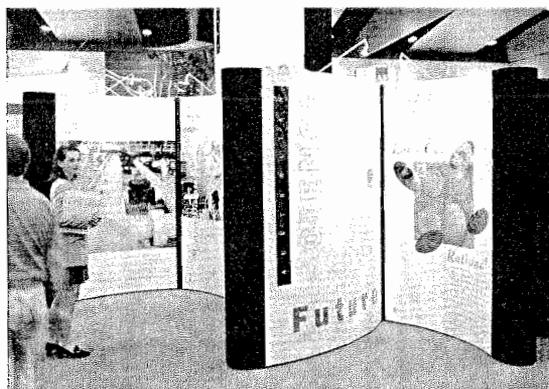
David Symington, from the Institute of Industrial Technologies, coordinated CSIRO's involvement in the event.

"We often forget that CSIRO has a great influence on the states and territories of Australia," David said at the opening of the exhibition. "CSIRO is a vital part of Victoria, and has been since it was founded here 70 years ago."

CSIRO spends more than \$200 million a year, just under 30% of its budget, in Victoria, and employs more than 2100 people, bringing millions of dollars to the state in research and development achievements.

Over the past five years CSIRO has completed more than 35 major projects that have assisted businesses, government bodies and the community of Victoria.

In collaboration with Victorian companies and government agencies, CSIRO has carried out ground-breaking research. The research to develop a drug to combat influenza is helping Biota, a Victorian company, to break into the international market through the European pharmaceutical giant Glaxo.



CSIRO display at the opening of Victoria's new exhibition centre

The Port Phillip Bay Study will help decision-makers and policy-makers better manage this major natural asset.

New technology to monitor our sewers and a very smart car battery tester are two examples of CSIRO contributing

to the inventiveness of Victoria.

More importantly, CSIRO research and development is a vital springboard for Victoria to develop a prosperous and robust future.

At *Victoria on Show*, CSIRO outlined some new and very promising research and development directions.

Some of our leading scientists and business people presented a series of easily understood talks on issues such as new drug developments, food export opportunities into Asia, and how new materials will change our cars, boats and even sporting goods.

This "Meet the the Scientists" program proved very popular with people from small to medium enterprises.

# Creating the framework for high-class research

Dear colleagues,

This is the first opportunity I have had to contribute to *CoResearch* and tradition dictates that I use it to set out some broad aspirations at the personal level and for CSIRO as a whole. At the broadest level, these goals are the same and are pretty modest and simple — to leave CSIRO at the end of my tenure in at least no worse shape than I found it. Partly this recognises that we are not in bad shape now, but even at this high level of generality, we all know it is far from simple.

CSIRO is in a very dynamic environment — the technologies we are interested in are moving quickly on a global stage, and our science is contributing to those movements; the industries that might use our technologies are restructuring continuously; and the aspirations of the people we serve (and whose money we mostly spend) are increasing in areas of direct and indirect consequence for our endeavours. CSIRO must be dynamic in response, so that "to be no worse than we were"

requires a good deal of running just to stand still.

Having read some of the early history (*Shaping Science and Industry: A History of Australia's Council for Scientific and Industrial Research, 1926-89* by C.B. Schedvin — a great read at a modest price) and been briefed in August 1995 and since taking up this job, it is clear that CSIRO has always been dynamic in its science and technology — we have had to be to stay world class. And world class we must continue to be because there are few prizes for coming second for us in our research, or for the Australian industry we support, in this competitive world.

The same sorts of pressures are affecting our administration, where the requirements to be efficient and accountable seem to be monotonically increasing along with the complexity of our work and consequences of error. Here, however, we can get some help from such developments as the better computer systems now available for basic project

accounting and we have an incentive for efficiencies that will free more resources to put back into our science and make our technology more competitive.

Even from this brief description, the next level goals are obvious — world class science and technology in an efficiently run organisation.

For such goals, no one individual inside or outside CSIRO has a monopoly on wisdom or knowledge. We all have something to contribute in our own areas of competence and responsibility and sometimes more widely. Mining that vein — however rich — can be difficult, but is an obvious prerequisite for even such modest goals.

Of course, we might do a lot better than "just stand still" and make great progress in the next five years. The opportunities are there. Externally they may come from the new ways of collaborating on and funding some of our science and technology, and the stronger links within our region with like-minded organisations.



Internally, they include all we do and are ours to exploit as best we can.

My guess is that my minimalist broad goal for CSIRO is not at much risk. While we have our current problems and future challenges, our science and technology is of high class and people throughout CSIRO are keen to get on and show how it can be better. My job as Chief Executive is to help create the framework to let them do it. This, too, is unlikely to be as simple as it sounds, but the sooner we get on with it the better. Certainly, it will be exciting and very satisfying along the way.

Dr Malcolm McIntosh  
Chief Executive

## CSIRO to establish Melbourne CBD office

The CSIRO Board agreed at its meeting on December 5 last year to establish a small Corporate Business Office in the Melbourne central business district and to vacate the premises at 407 Royal Parade, Parkville.

Incoming Chief Executive Dr Malcolm McIntosh will work out of the Corporate Business Office when in Melbourne.

Dr McIntosh's primary base will be in Canberra, to reflect the importance of the Government as CSIRO's principal stakeholder.

The Corporate Business Office in Melbourne will comprise a core group of staff, including the Chief General Manager of Corporate Business, Dr Tom Biegler. The move to the CBD is designed to provide increased access to key stakeholders in the business community.

Then Chief Executive Dr Roy Green said at the time of the decision: "I believe these decisions will help us move forward in both trialing and implementing structural change. Dr McIntosh also believes it will provide him with the ability to focus immediately on his liaison with key stakeholders in both Government and the private sector."

## NML given National Facility status

By NICK GOLDIE

In December last year the Federal Government announced that CSIRO's National Measurement Laboratory, part of the Division of Applied Physics, was to be declared a National Facility.

The announcement was made by Senator Chris Schacht, Minister for Small Business, Customs and Construction, as part of the Government's Innovate Australia package.

The status of National Facility not only gives recognition to the NML, but also ensures that

funding for the Laboratory is established on a permanent and independent basis.

"This will have tremendous impact on the work of the Laboratory," said Chief Standards Scientist Dr Barry Inglis. "The Government's action will also reinforce our activities in the Asia-Pacific region by enabling NML to continue supporting the development of regional measurement standards."

Today we take it for granted that Australian spare parts for a Japanese car manufactured in the UK will actually fit. National and international

standards are an essential part of modern commerce and manufacturing.

But it was not until the Second World War that the National Standards Laboratory was completed, as part of CSIR, on the grounds of Sydney University.

The need for such a facility became apparent many years before, when it was decided, in 1911, to build a small-arms factory at Lithgow in New South Wales.

The Lee-Enfield .303 was the standard weapon of the soldiers of the Empire, and the intention was that Australian rifles,

ammunition and components would be inter-changeable with British arms.

However, after the factory was built it was found that the so-called "Enfield inch" differed by 0.00035 from the Imperial inch. There were red faces, re-tooling, and time and money spent before the Australian weapons were ready to be used overseas.

In 1973 the National Standards Laboratory came under review, and the following year became the National Measurement Laboratory. It moved to its present site at Lindfield in 1977-78.

## Seventy reasons to celebrate

CSIRO is having an important birthday this year. It is 70 years since it was established by the Commonwealth Government, in 1926, as the Council for Scientific and Industrial Research. It became CSIRO in 1949.

The moves to make science in Australia a national rather than state responsibility grew out of the period of nationalism

that began during the First World War.

In fact, in December 1915 — on the same day that the successful ANZAC withdrawal from Gallipoli had been announced — Prime Minister Billy Hughes addressed a luncheon at Melbourne University about a scheme for national scientific research.

He declared, without prior planning, that the Commonwealth would find whatever

money was needed to establish a "national laboratory" to co-ordinate scientific endeavour throughout the country.

By the 1920s, there was recognition of the link between scientific research and economic development. But there was only limited research being done by universities, and the various state agricultural departments were inadequate to meet the demands of national science for industry.

Today, with its increased emphasis on commercialisation of research, CSIRO has never been more focused on meeting those demands.

• How should CSIRO celebrate its birthday? Readers are invited to submit ideas to *CoResearch*. We would also welcome your anecdotes and snippets of CSIRO history for a historical edition of *CoResearch* to be published later this year. The deadline for contributions is April 3.

## Townsville laboratory opens

Melbourne Cup Day, November 7, last year proved a winner for the industries of northern Australia when the new improved CSIRO facilities in Townsville were opened by the local member, Ted Lindsay.

"The Davies Laboratory is the largest CSIRO laboratory in tropical Australia," Mr Lindsay said. "It already holds an international reputation in research excellence and this improved facility will mean that research will continue to deliver benefits to Australia's tropics."

The extensions include soil, water and plant analysis laboratories, a constant-temperature room, chemical store, GIS laboratory, meeting room, general laboratories and offices, as well as the new entrance and seminar facilities.

Projects were represented in a foyer display, a highlight being the soybean products available to sample.

# Malcolm McIntosh on deck

Our new Chief Executive, Dr Malcolm McIntosh, started on February 5 and attended his first formal Board meeting on February 20.

I am sure all staff join with the Board in welcoming Dr McIntosh. We all look forward to working with him on the many significant issues currently facing CSIRO and Australian science.

Dr McIntosh is having briefing sessions with all Directors, Chiefs and other senior staff and has scheduled regular face to face group discussions with Executive Committee members.

Dr McIntosh's extensive working knowledge of the complex interfaces between science, government and industry in Australia and the United Kingdom is just one of the valuable capabilities CSIRO has acquired with his appointment. We are fortunate



to have his leadership and management skills to take the Organisation forward.

The issues discussed at the February Board meeting (which Directors also attended) included the new structure, interaction with SMEs, the CRC program, communication, balancing the demands of external earnings with the need to protect our strategic research

base and streamlining our administration. Dr McIntosh and the Board are resolved to continue our long tradition of delivering benefits to the nation through our excellent science.

The evening prior to the Board meeting we farewelled three significant contributors to CSIRO.

Dr Roy Green is going to take up a position with the International Oceanographic Commission, an agency of UNESCO in Paris. Roy did a wonderful job as Chief Executive and we all owe him a debt of gratitude for his grit and determination in tackling some difficult issues over the past year. We wish him every success in his two-year appointment in Paris.

We also farewelled Professor John de Laeter. As CSIRO's "man in the west" for the past three years, John has been extremely effective in representing the Organisation at the highest levels in government

and the general community there. Professor de Laeter was a most valued contributor to the Board's activities and will continue to be involved in science policy issues through his recent appointments to ASTEC and the Prime Minister's Science and Engineering Council.

The third farewell was to Dr Alan Reid, who completed his term as Director of the Institute of Minerals, Energy and Construction on February 2. His career in CSIRO spanned 37 years and was highlighted by many significant scientific and management achievements.

At the February meeting we also welcomed a new Board member from Western Australia, Dr Eric Tan. He is Managing Director of Medical Corporation Australia with business interests in Vietnam, China, Indonesia and Malaysia. We look forward to working with Dr Tan as we begin a new year.

## Exploration and Mining staff win research award

A CSIRO team was among the winners of the second annual Australian Coal Association Excellence in Research Awards.

The awards, for projects completed in 1994-95, were presented in December by the NSW Minister for Mineral Resources and Fisheries, Robert Martin.

The award for the best open cut research project with ACARP assistance went to the CSIRO Exploration and Mining research group of Mihai Borsaru, Jack Charbucinski, Charles Ceravolo, Tseviet Tchen and Geoff Carson for their research on the development of the Coal Face Analyser and Zero Probe.

## Important

Raw ash content is an important parameter for determining coal quality, and tests at mines in New South Wales and Queensland have proved that the Coal Face Analyser is capable of determining the ash content of coal on the coal face.

The prototype instrument is portable, weighing only 2.5kg. It is more accurate than existing devices but also uses a low-intensity source below the threshold that requires registration as a radioactive instrument.

## Safer

The Zero Probe is a safer, portable and more environmental approach to coal logging operations. Trials at Sydney and Bowen basin coal mines demonstrated that the Zero Probe can be applied to problems of coal delineation and coal ash determination.

When placed within a borehole, the probe uses a 1.1 MBq radioactive source, one-third the minimum radioactivity recommended by the New South Wales and Queensland health authorities to obtain spectrometric information.

This reduction of source radiation compared to conventional probes minimises operational risks while increasing quality logging data.

The Coal Face Analyser and Zero Probe technology are now being commercialised.

—Kent Quigley  
CSIRO Exploration & Mining

# Parkes radio telescope gets major transplant

BY HELEN SIM

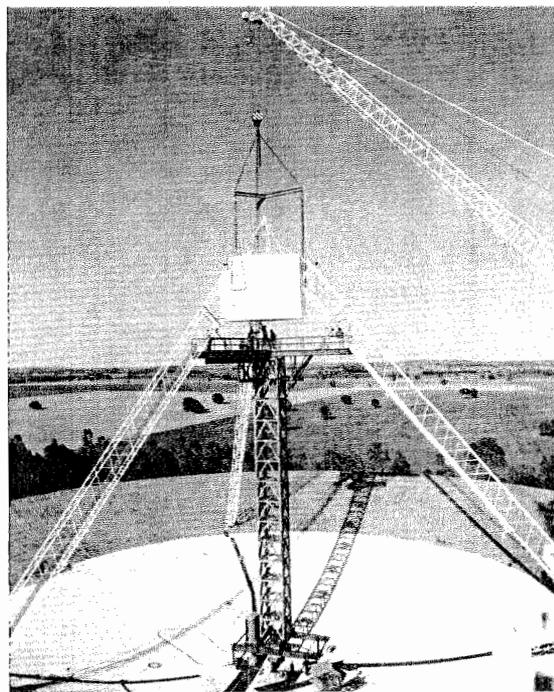
The US space agency NASA has funded a major upgrade of CSIRO's Parkes radio telescope so it can use it to receive signals from the Galileo spacecraft now orbiting Jupiter.

The Parkes telescope will track Galileo for nine to 10 hours a day for about 13 months from November this year.

Galileo was launched in 1989 to study Jupiter and its moons. It will take pictures of the planet from mid-1996 to November 1997.

The first major results have come back from the satellite — the findings of a probe that was dropped into Jupiter's atmosphere in December. (One of CSIRO's other radio telescopes, the Australia Telescope Compact Array near Narrabri in New South Wales, was one of only two telescopes in the world to 'eavesdrop' directly on the probe rather than listen to the signals relayed from the main spacecraft.)

Despite this good start, the Galileo mission has a problem. The spacecraft's main radio antenna did not unfold after launch and all efforts to deploy it have failed. Galileo must now send its data back to Earth through a smaller, less powerful antenna.



The new focus cabin is lowered into place as the Parkes telescope is upgraded for its role in tracking the Galileo spacecraft

The data will flow back more slowly and so the spacecraft is being re-programmed to store and transmit its data in a new sequence. And to catch more of the weaker signals NASA needs more receiving antennas on Earth — such as Parkes.

The Parkes telescope will work in tandem with similar large antennas at the Canberra Deep Space Communications Complex, which is managed for NASA by the Australian Space Office.

Supporting Galileo is the Parkes telescope's largest

project in its 30-odd year history and the upgrade for the mission is the greatest change made to the telescope since it was built.

The upgrade involves replacing the focus cabin at the apex of the telescope, 58 metres above ground. This cabin holds the equipment that turns radio signals from space into electrical signals that can be processed.

The new cabin makes it possible to quickly swap receivers, so the telescope can switch quickly between following Galileo and doing normal astronomy.

The climax of the upgrade came on December 10-11, when the new focus cabin was craned into place. This delicate operation had to be carried out by Evans Deakin Engineering Pty Ltd, with input from CSIRO. CSIRO is also building a special piece of equipment for the mission — a receiver operating at 2.3 GHz to amplify the weak signals the telescope captures from Galileo.

The Parkes telescope is part of the Australia Telescope, a group of three observatories operated by CSIRO's Australia Telescope National Facility.

The telescope's upgrade was carried out by CSIRO under a \$2.25 million contract with the Australia Space Office, acting on behalf of NASA.

# Short shots

## Award for ecological researcher

Dr Mike Austin from the Division of Wildlife and Ecology has received a gold medal from the Ecological Society of Australia.

The medal was presented in December at an afternoon tea at the Division's Canberra headquarters by the society's Vice President Dr Jill Landsberg.

"Mike has been a pathfinder in the field of natural resource inventory, especially in its application to regional planning," said Dr Landsberg.

Mike's special area of research is ecological theory and the analysis and survey of vegetation patterns. His latest work includes reconstructing the pre-1750 forest vegetation patterns along the NSW south coast, and researching the impact of forest fragmentation in the Coolangubra State Forest in New South Wales.

## Dr McIntosh knighted

CSIRO's new Chief Executive, Dr Malcolm McIntosh, was awarded a knighthood in Britain's New Year's Honours List this year. However, Dr McIntosh does not intend to adopt the British honour in Australia.

## Semen centre open for business

CSIRO's Ram Semen Centre at Chiswick in New South Wales, launched on January 19 this year, will give sheep producers greater access to CSIRO's artificial breeding technology.

The new venture has been made possible by the appointment of New England Artificial Breeders Pty



Gold medal winner Dr Mike Austin (centre) with Dr Jill Landsberg and Dr Brian Walker, Chief of the Division of Wildlife and Ecology

Ltd (NEAB) as licensee for the commercial activities of CSIRO's Ovine Semen Collection Centre.

NEAB's managing director, Warren Nancarrow, says: "We are very excited about this new stage in the development of our company and for the opportunity to provide a new service using the latest in technology which will meet producers' complete artificial breeding requirements."

The centre at the CSIRO Division of Animal Production on the New England Highway at Chiswick, south of Armidale, had previously offered a limited semen processing service to local producers as an extension of its own research requirements.

The increasing demand for semen collection and processing has been welcomed as an opportunity to extend the services to Australian meat and wool sheep producers.

"The licensing of this facility means that CSIRO can focus its attention on its research for livestock producers, confident that the service is in good hands," says Dr Oliver Mayo, Chief of the Division of Animal Production.

"The centre will be renamed the New England Ram Centre to highlight the service provided to sheep producers in northern NSW."

The services at the centre — dubbed by rustic local wit as the Wankertorium — will include ram semen collection, processing and storage. A complete artificial breeding service, including laparoscopic artificial insemination and embryo transfer, will also be available through a new alliance between NEAB and Macquarie Artificial Breeders of Dubbo.

## Breakfast builds industry contacts

The Division of Building, Construction and Engineering held an industry breakfast in Brisbane in December to support and build contacts with key personnel involved in the planning, construction and management of Queensland's urban infrastructure. Division Chief Larry Little said: "The breakfast had

several objectives: to establish our presence in Queensland; to ensure our industry is well informed on the future requirements for infrastructure in Queensland; and to promote the capabilities and skills of the Division."

Terence Mackenroth, Queensland Minister for Housing, Local Government and Planning, and Brian DeLuca, general manager of business development with Barclay Mowlem, joined Mr Little as speakers at the breakfast.

"The follow-up visits to industry and the survey of attendees has proven this to be a successful way to build awareness in the market and reach our potential clients," Mr Little said. "We are already planning similar events in other capital cities."

## Pedalling in search of sponsorship

The CSIRO team that has been so successful in the Melbourne-based corporate "Around the Bay Ride" for the past two years is seeking sponsors and riders.

For the past two years, the cycling team has been entering as the Division of Materials Science and Technology Social Club, which has paid the corporate entry fee. Individual riders have met all the other costs, especially clothing costs for the race. To increase their profile — and compete with the many impressively togged-out private-sector teams — the riders need sponsorship for clothing displaying the CSIRO logo.

Ideas about sponsorship would be welcomed by team organisers Bob Brett (B. Brett@mst.csiro.au) and Peter Curtis (P. Curtis@mst.csiro.au). They are also keen to hear from anyone interested in joining the team and perhaps even acting as a Division co-ordinator.

## Mining breakthrough worth millions

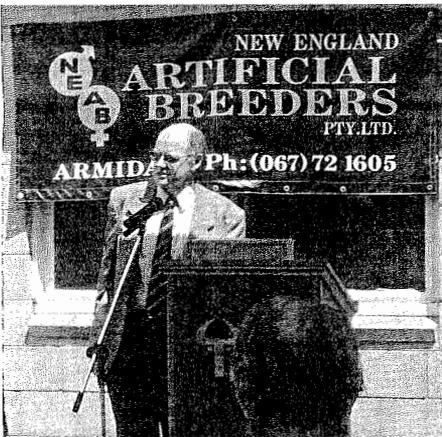
CSIRO's Division of Building, Construction and Engineering has identified new mixing techniques for the mineral industry that will reduce operating costs by millions of dollars a year.

The Division was commissioned by Queensland Alumina to investigate scaling problems at its bauxite refinery in Gladstone that resulted in mixing digesters being inoperative for several months a year.

Chief research scientist Martin Welsh explains: "The digesters, which are used to extract alumina from the ore slurry, were proving costly, inefficient and required manual de-scaling with jack hammers.

"Our research identified a way to reduce scaling, reduce power consumption to 40% of current demand and increase on-line time for equipment. Our change to the internal design allows de-scaling to be done mechanically in days instead of months."

Queensland Alumina plant engineer Kevin Baillie says: "A number of specialists have attempted to reduce the scaling problem, but the researchers at CSIRO are the first to provide a successful outcome. QAL is delighted with the success of the research. The company has developed good relationships with CSIRO and looks forward to future developments."



Dr Oliver Mayo, Chief of the Division of Animal Production, speaking at the launch of the Ram Semen Centre in January

# Australian link in new-generation satellite

Australian scientific programs for ocean monitoring will be used on the first of a new generation of earth observation satellites to be launched in 1999.

The ENVISAT satellite is being developed at a cost of \$US2 billion by the European Space Agency (ESA).

Scientists including CSIRO Marine Laboratories' Dr Ian Barton met with the Head of ESA's Earth Observation Mission Management Office, Dr Guy Duchossois, during the Australian Meteorological and

Oceanographic Conference in Hobart in January.

Dr Barton is a member of the research team that developed the Advanced Along Track Scanning Radiometer (AATSR) and is also a member of the Australia-UK AATSR Science Management team, which meets for the first time in the UK this month.

As one of its main missions, the AATSR measures sea surface temperatures to within an accuracy of one quarter of a degree, providing long-term data for climate studies.

Other members of the Australian science team are the

Bureau of Meteorology, CSIRO Oceanography and Atmospheric Research, IASOS at the University of Tasmania, and the Australian Institute of Marine Science.

Dr Duchossois said Australian research and industry has linked strong experimental programs to the first two satellites, ERS-1 and ERS-2, boosting oceans and atmospheric research and providing a new dimension on climate variability and global warming studies.

"Since the launch of ERS-1 in 1991, Australian science and industry has been a significant research partner both in the

construction of satellite instruments, the development of data applications and in validating the data received for the climate change and land use programs," he said.

"EVISAT will carry a far more powerful synthetic aperture radar providing greater flexibility in our ability to detect environmental changes in the oceans, on land and around ice caps, generating a new standard of information to be incorporated into scientific programs."

Other instruments on board EVISAT to support Australian research will be:

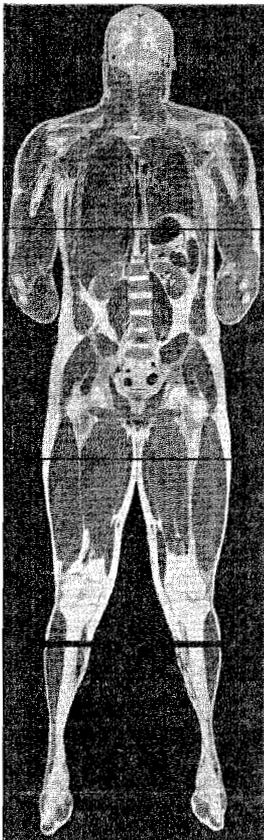
- An ocean colour instrument

detecting chlorophyll and phytoplankton to determine the health of the oceans and the strength of the food chain.

- Atmospheric chemistry instruments as part of the global ozone monitoring program, and also for measuring trace gases in the stratosphere and troposphere.

Dr Duchossois said both ESR-1 and ESR-2 have helped Australian oceanographers to better understand El Nino Southern Oscillation events through sea surface temperature and topography observations, together with wind patterns in the Indian and Pacific Oceans.

# Computers put humans, plants into cyberspace



The Visible Man: Sliced into 1878 sections

BY CHRISTIAN PETERSON

## Super computers are making the invisible visible.

Researchers using high-performance computing (HPC) are pushing forward the frontiers of our knowledge, as well as providing major advantages in the competitive world of medical technology, drug design, agrochemicals and food production.

More than 60 leading researchers assembled in Melbourne in February for the Second CSIRO Symposium on 'Computational Challenges in Life Sciences'.

They outlined current trends in applying HPC to solve some of the most complex problems in biology and medicine.

Professor Victor Spitzer, from the University of Colorado Health Sciences Centre in the US, outlined his work in the 'Visible Human Project — Male and Female'.

Just before lunch, Professor Spitzer explained how he and his team sliced up a 38-year-old male cadaver into 1878 one-millimetre-thick cross-sections.

"It took us some time to find the right body," he said. "Our specifications were very strict: no defects, no abnormalities, or diseases."

Eventually an executed prisoner became available who met the specifications, even though one testicle was missing.

It took three months of painstaking work by two medical students to prepare the body for scanning into a high-performance computer.

The cross-sections were hand-sawn by the students. There were groans from the symposium audience as Professor Spitzer showed his slides of the procedure.

The axial cross-sections, together with CAT and NMR scans, were stored on a high-performance computer, from which 3D images can be created for certain regions of the anatomy.

Last November, after a year of preparation, a Visible Woman was also scanned.

Using information from the Visible Man and Woman project, surgical simulation is possible, allowing doctors in the future to carry out virtual surgery.

Professor Spitzer believes models of the human form inside super computers will be used in future for animation in the entertainment industry, as well as for medical research.

"One day we will be able to make the Visible Humans grow younger or older," he says. "We

might even make them obese, or infect them with a virus or promote cancers in them. These Cyberspace Humans will be fundamental to medical research in the future."

At the symposium, other leaders in their areas outlined their work on the nervous system and the brain, and on protein sequencing.

Conference coordinator Dr Marek Michalewicz, from CSIRO's Supercomputing Support Group, said: "We are just beginning to realise the importance of high-performance computing in the development of life sciences.

"Virtual experiments will greatly enhance the advancement of knowledge, saving us time and money. They will also avoid dangerous experimental procedures."

Australian presenters at the conference included Jim Hannan from CSIRO's Division of Entomology and the Cooperative Centre for Tropical Pest Management, who outlined his work on the practical aspects of virtual plants.

He explained how super computing can help researchers understand in-depth plant architecture, from the level of plant cells up to stands of plants and biomass studies.



Mr Bradfield: A number of Divisions will be contributing

## CSIRO in Olympic Village bid

CSIRO has joined a consortium led by Lend Lease and Mirvac Ltd bidding to construct the Olympic Games Village at Homebush Bay in Sydney.

The bid is one of the ways in which CSIRO is hoping to contribute to Australia's hosting of the 2000 Olympics.

CSIRO's Principal Business Development Adviser, Peter Bradfield, has been leading CSIRO's liaison with the Olympic Co-ordination Agency (OCA) of the New South Wales Government in an effort to identify opportunities for CSIRO to contribute.

Dr Graham Allison of the Division of Water Resources has been overseeing the technical input to these discussions.

"Initially we had planned to be involved with any of the tenderers who wanted our input," Mr Bradfield says.

"But this would remove us from the planning stage of the bids, and it was at this stage that we believe our input would be most appropriate.

"Consequently, the Chief Executive and EC agreed to join the Lend Lease/Mirvac consortium, which is one of four to make a formal expression of interest for the construction of the village."

Other participants in the consortium include James Hardie Industries, CSR and Westpac.

Mr Bradfield has also been appointed to the newly created Environment Advisory Panel of the Olympic Co-ordination Agency and as a Member of the Olympics Business Roundtable Showcasing Taskforce.

"The Olympic Co-ordination Agency is also keen to draw on CSIRO's expertise relevant to other Olympic projects, to ensure the Games are also noted for technological innovations, especially in environmental areas," he says.

## GLOBE project seeks partners

CSIRO Education Programs has been appointed as National Coordinator of the GLOBE Project — Global Learning and Observations to Benefit the Environment.

GLOBE, an initiative of US Vice-President Al Gore, has created an international network of students in primary and secondary schools who study environmental issues, make environmental measurements, and share useful environmental data with the international environmental science community.

The program is seeking expressions of interest from Australian scientists who could use the data being generated or could suggest alternative data collections to assist with their work. You might want to use just Australian data or draw on the world-wide information.

The Australian Government participates in the GLOBE project as part of its commitment to international co-operation on

the environment. The project is supported by the Department of the Environment, Sport and Territories and the Department of Employment, Education and Training.

The project is also being undertaken with the active support of state and territory education departments, the Australian Nature Conservation Agency and the Bureau of Meteorology. Participation is being facilitated through the Australian Educational Resource Information Network (ERIN) via the Internet.

Students involved in the project conduct environmental measurements near their school and report their data to GLOBE. Schools then have access, via the Internet, to vivid graphical global environmental images produced in the United States from participants' data.



Students in 30 Australian schools will gather data for the GLOBE project

This allows students to be actively involved in global environmental studies that will broaden their environmental knowledge and understanding. It will also provide an opportunity to create personal links with other schools here and overseas.

The data being collected by the GLOBE project include land cover, species identification and biometry, soil moisture, water temperature, water pH and weather measurements.

This is the first year of GLOBE in Australia and the number of fully participating schools has been limited to 30. However, others are able to play a role as affiliated schools, and the number of Australian schools taking part is expected to rise after the trial period.

A teacher training session was conducted last October for all participating schools and GLOBE educational materials have been provided to them, outlining the procedures for taking the environmental measurements and the protocols for reporting data.

If you would like further information about GLOBE or are interested in taking part, contact Ross Kingsland, Manager, CSIRO Education Programs on (06) 276 6477, fax (06) 2766641 or email ross.kingsland@helix.csiro.au.

# Award for work on two fronts

BY CHRISTIAN PETERSON

**Dr Annabelle Duncan combines science and biological arms control and is very good at both.**

In recognition of her efforts, this year Dr Duncan received an Australia Day Honour: the Public Service Medal for outstanding public service as a research scientist and a senior adviser to Australia and the United Nations in international arms control and disarmament.

Dr Duncan leads the Microbiological Processes Group at the Division of Chemical and Polymers. Her work on the treatment of industrial wastes has greatly increased our understanding of the microbiology of the anaerobic digestion process and will help with major waste control in the future.

She is now working on optimising the production of anti-cancer drugs by fermentation and is also investigating the survival of micro-organisms on Australia's new plastic banknotes.

Since 1991, Dr Duncan has been an adviser to the Department of Foreign Affairs and Trade on Biological Weapons Control and has represented Australia at 10 international arms control meetings.

The United Nations Special Commission invited her to be part of the inspection teams to go to Iraq. "Before we landed in Iraq, we were briefed in Bahrain on what to expect," Dr Duncan says. "We were told we would be followed everywhere, that our rooms would be bugged. We soon learnt how to use this to



Dr Duncan (second from left) with an international arms-control inspection team headed for Iraq

our advantage." She is a little reticent about explaining how to use bugs and intelligence

officers to advantage in case a return trip is necessary.

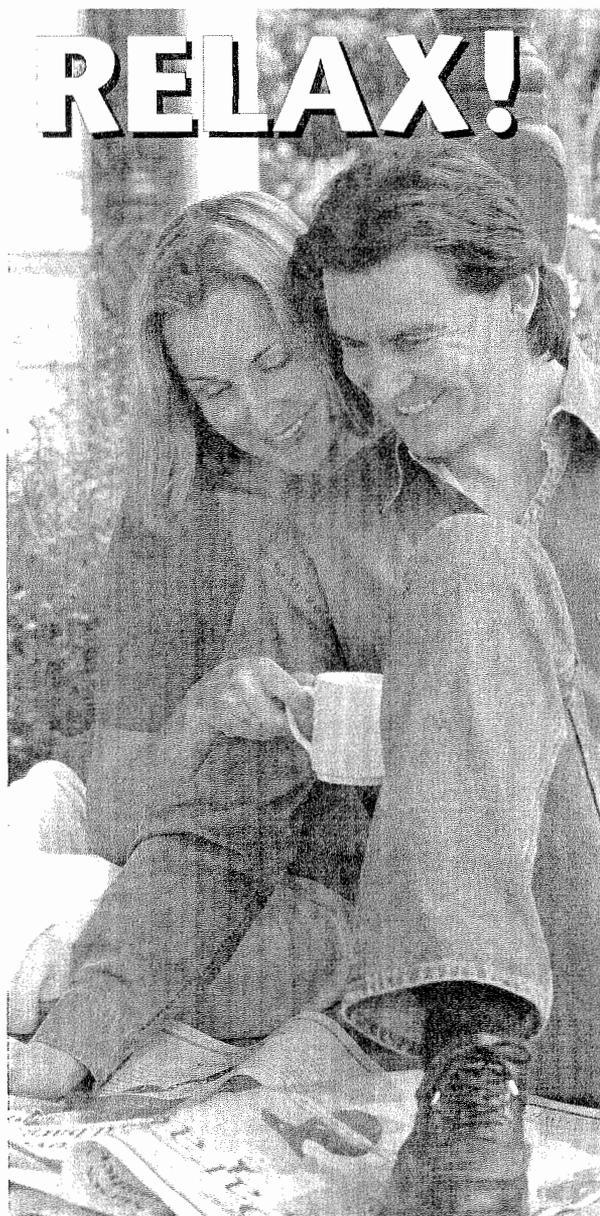
Other CSIRO people who received Australia Day Honours were:

- Dr Bob Frater, AO, Director, Institute of Information Science and Engineering, for service to radio astronomy.
- Professor Paul Nestel, AO, former chief of the Division of

Human Nutrition, for services to medicine, particularly for research into heart disease and its prevention.

- Dr Dave Mahoney, AM, former Chief of the Division of Tropical Animal Production, for services to veterinary science, particularly for research into vaccines against serious cattle diseases.

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## Pollution study turns up a surprise villain

Domestic animal faeces are widely blamed for polluting our waterways, but a CSIRO technique for chemically tracing sewage shows domestic animals are not the only culprits.

CSIRO Oceanography has analysed faecal sterol biomarkers to determine the source and amounts of faeces in waterways.

A study of Lake Tuggerah for the Wyong Shire Council in New South Wales found that as much as 80 per cent of the faecal pollution after rain was from sea birds. Domestic animals accounted for 15 per cent.

The rest of the faecal contamination was from rural catchments — farm animals and native animals such as kangaroos. Human faecal contamination was either negligible or below detection.

The same technique is being applied to Melbourne's Yarra River in a collaborative study with the Victorian Environment Protection Authority.

The biomarker studies are being undertaken by Rhys Leeming and Peter Nichols of CSIRO Oceanography in Hobart.

"The issue is a nationwide one," Rhys Leeming says. "Many councils have unexplained faecal

contamination after rain based on faecal coliform assays. Up to now, there has been only circumstantial evidence that it might be caused by domestic animals or birds."

Councils have also had no way of knowing whether the contamination is from storm water rather than from leaking sewers.

The technique of identifying the constituents — or biomarkers — of the different types of organic matter in the catchments is used in conjunction with existing bacterial indicators. "It requires a bit of detective work to distinguish the quantities of the various sources," Rhys says.

Faeces from humans and herbivores have biomarkers with distinguishing characteristics; faeces from dogs and birds are distinguished mostly by bacterial indicators.

Rhys Leeming says the studies of faecal contamination are just one part of a much broader study of biomarkers, looking at all types of organic matter that end up in the catchments. "We are interested in understanding how organic matter and accompanying nutrients cycle through the environment and what the consequences of that are."

## Forestry, Forest Products in merger

The Divisions of Forestry and Forest Products (Institute of Plant Production and Processing) merged to form a new Division in January.

The merger follows a recommendation from a performance evaluation of the Division of Forest Products undertaken in May 1995 by a panel largely drawn from industry. Dr Glen Kile will be the Chief of the new Division.

The new unified Division will bring CSIRO's forestry and forest products research together within a single industry business framework, enhancing the innovative opportunities for an industry undergoing considerable change.

Dr John Radcliffe, Director of the Institute of Plant Production and Processing, paid tribute to Dr Warren Hewertson, who completed his term as Chief of Forest Products in January.

Dr Hewertson will be continuing his long and distinguished contribution to Australian forestry as Chief Research Scientist in the new division, with special responsibilities for continued commercial development of a number of new forest products technologies.

The evaluation panel was chaired by Professor Ian Ferguson of the University of Melbourne. Other members were Professor Bart Banks of the University of Wales; Ron Adams, Bunnings; Len Johnson, ANM; Karl Kny, Ancor Paper; and Dr Ken Old, CSIRO Division of Forestry.

# Industry set for growth, says new Division head

The new Division of Forestry and Forest Products is headed by Dr Glen Kile, who had been Chief of the Division of Forestry since 1992.

Dr Kile is enthusiastic about the new Division's prospects. With 280 staff across five sites (Perth, Mt Gambier, Hobart, Melbourne and Canberra) the Division is well placed to interact with regionally based industry.

"I have a realistic expectation that the forest and forest products industry is entering a fairly strong growth phase in Australia over the next decade and we would hope to be effective in serving its needs," Dr Kile says.

The forestry and forest products industry is facing major challenges, especially concerning the resource base and in the development of new wood processing enterprises. "A major part of expanding the industry in Australia is to create more resource and that can only be done these days on cleared agricultural lands," Dr Kile says.

"An increasing proportion of Australia's wood supply will come from plantations and farm forestry. Commercially driven revegetation strategies and integration of trees into agricultural systems offers enormous national opportunity for commercial benefits through amelioration of land degradation.

Dr Kile says expanding supplies of timber are also creating new opportunities for industrial processing for a wide range of products from solid timber to panels and



Dr Glen Kile: "An increasing proportion of Australia's wood supply will come from plantations and farmed forestry"

reconstituted products such as medium density fibreboard and pulp and paper."

He believes the Division is well placed to continue to assist at all levels of the industry. "Our research is involved in most aspects of the production-processing chain, including recycling.

"We're also focusing much more on the quality of the wood that's being produced these days. There's a great deal of interest in being able to manipulate the properties of wood to influence the ease of processing or the quality of the wood for particular end products."

Dr Kile is an Agricultural Science and PhD graduate from the University of Tasmania. In

1972, he was appointed by the Forest and Timber Bureau's Forest Research Institute, which was restructured as CSIRO's Division of Forest Research in 1975. Before becoming Chief of the Division of Forestry, he was Director of the Co-operative Research Centre for Temperate Hardwood Forestry in Hobart.

Dr Kile's research background is in forest pathology, and the protection of natural forests and plantations from pests and diseases is an on-going interest. "The expansion of hardwood plantations in Australia will create some challenges as we are growing these species in the presence of their indigenous pests and diseases," he says. "On the other hand, exotics such as radiata pine have a

comparative advantage, as most natural pests and diseases are not present. Continued quarantine protection for exotic species is a very important requirement."

Considering the immediate future, Dr Kile says: "I think we have a major task in bringing the two Divisions together, functionally and structurally, and to integrate the new Division into the new Alliance Sector arrangements while continuing to develop the cross-sector research we do."

He says important initiatives in cross-sector research include work on the potential for development of a forest products industry in irrigated areas of the Murray Darling Basin and rapid automated measurement of wood properties.

"Work in the MDB has brought together resource development and products research in an integrated framework which will result in the future in well presented technical and economic information on the prospects for industry development in the region," Dr Kile says.

"Rapid measurement of wood properties is an area where CSIRO has developed leading edge technology, providing the opportunity to more readily link the effects of genetics and growing conditions.

"My hope is that we go forward with an expanding industry that we're able to maintain, and increase our expertise in particular areas and put a high-quality input into the development of the industry in Australia," Dr Kile says.

## Farm research helps clarify role of turbidity

The Hughes family in the Western Murray region, 40 kms west of Deniliquin, have allowed Division of Water Resources scientists to experiment in their rice fields this season.

On Tuesday, January 16, the Division opened its lab to Laurie and Norma Hughes and their daughter Loretta, and gave them a sit-down, air-conditioned seminar room tour of their 680-hectare rice, cattle and sheep property, Kalawar, almost 300 kilometres away.

With the aid of space-age Landsat technology, scientists Dr Henry Barrs and Dr Liz Humphreys were able to show satellite imagery of rice crops.

Mr Hughes took a pointer and identified his property, which has suffered mysterious rice yield losses of between 0.5 and one tonne a hectare, or about 10 per cent, compared to Eastern Murray rice yields.

Dr Humphreys and her team are working with the Western Murray Valley Yield Lift Project Steering Committee. With funding from the Rice Industry and Rural Industries Research and Development Corporation, Dr Humphreys has been investigating factors that might be contributing to lower yields.

Dr Humphreys said her work was made easier because the Hughes were very good farmers and sticklers for records and details. Mrs Hughes and Loretta

had kept meticulous records of irrigation use that gave the team a flying start in its work.

CSIRO is studying factors such as crop establishment technique, muddy water, soil type, and water temperature during critical stages of crop development. As part of the research, Dr Humphreys' team took a trailer load of highly dispersing soil from Deniboota to Griffith, for closer monitoring of muddy and clear water in specially constructed ponds.

The turbidity of the water was observed, as well as water temperatures in the ponds and in rice plots at Kalawar, with the assistance of CSIRO's Roger Sides and Carl Pender. The team has found that the temperature

at the soil surface in turbid water can be up to 10°C lower than in clear water during the establishment of a rice crop.

Dr Barrs backed-up the findings of Dr Humphreys. He used satellite imagery of the Hughes' and neighbouring farms to distinguish irrigation water that varied in quality from different sources of supply. Dr Barrs said it appeared that turbid water was colder, due to light bouncing back more than it would from clear water.

CSIRO has collected a lot of information from the rice paddies at Kalawar and will try to estimate turbidity percentages within a range across the whole Western Murray Valley.

Dr Barrs, through his remote

sensing work, has for some time been able to identify all of the irrigated summer crops across Southern NSW to a high degree of accuracy.

Evan Christen discussed irrigation drainage and mole drainage with the visitors and took them to Jim Geltch's farm. Melissa Walsh gave a presentation on SWAGMAN Whatif and Destiny, predicting the impact of cropping patterns, water management and climate on water tables and salt. Graeme Nicoll conducted the tour of Dr Nihal Jayawardane's FILTER project. John Blackwell discussed soil slotting.

—Reprinted from the Division of Water Resources newsletter, *Channels*

# The passing of a character — and mate



Bill Williams and dog 'CSIRO': His humour and kindness will be long remembered

*William Thomas Williams, alias Botany Bill, died on October 15 last year aged 82. Dr Godfrey N. Lance, former Chief of the Division of Computing Research, has written this tribute.*

**In all senses of the word, Bill was a "character": a brilliant scientist, an accomplished pianist and a great "mate".**

He accepted my invitation to visit Australia in early 1965 so that CSIRO could benefit from his considerable knowledge of numerical taxonomy. During the late 1950s, at Southampton University, we had written several joint papers on the subject.

The visit surpassed our wildest dreams because, after returning home, he asked if he could join DCR as an SPRS. This meant giving up his Southampton Chair of Botany and position as Head of the Department. On January 1, 1966, he joined the Computing Research Section in Canberra, where all the Section's research was based.

After a few years Bill requested a move to Brisbane because Canberra was "too bloody cold". He transferred to the Division of Tropical Pastures, at St Lucia, in June 1968. However, our close collaboration continued and we wrote many joint papers and two became "Citation Classics" in 1980 and 1986. His work always involved

helping others, and he worked closely with Len Webb during the Brisbane days.

On his "retirement", in April 1973, Bill decided that Brisbane was "too bloody cold" and asked Les Edye if he could have some assistance to move to Townsville, with his mother, where he was already collaborating with staff at the Australian Institute of Marine Sciences. Les welcomed him with open arms and offered Bill any assistance he wanted. Bill asked for a glass house, to which Les replied "Oh! You're going back to doing practical botany!". "No," said Bill. "I want to live in it."

Bill owned two grand pianos and spent much of his time teaching advanced piano students and accompanying

other instrumentalists. He began regular contributions to the ABC's science programs during the 1965 visit, and in 1971 a short collection of his talks was published as *The Four Prisons of Man*. More recently he contributed to the Ockham's Razor series. His encyclopaedic mind enabled him also to become an authority on subjects as diverse as science fiction and Sherlock Holmes.

He is the only person I know of who is listed in the Australian *Who's Who* with a hobby of "beer drinking"; he was as successful at his hobby as he was at everything else. Bill's humour and kindness will be long remembered, with affection, by all those who knew him.

## Surgeon joins Board

**Dr Eric Tan, an eminent surgeon with a strong interest in community service, has joined the CSIRO Board.**

Dr Tan graduated in Medicine from the University of Western Australia with the AMA Gold Medal in 1968.

He is a Fellow of the Royal Australasian College of Surgeons and the American College of Surgeons. As a Governor of the Endoscopic and Laparoscopic Surgeons of Asia Society, he has taught endoscopic surgery in various countries in Asia and convened the first Asia/Australia Endosurgery Congress.

For many years he was a Senior Visiting Surgeon at Royal Perth Hospital and a Senior Lecturer in Surgery at the University of Western Australia.

Dr Tan is now the Managing Director of Medical Corporation Australia Limited, with business



Dr Tan: A strong interest in community service

interests in Vietnam, China, Indonesia and Malaysia, and is Vice-President of the Western Australian Chinese Chamber of Commerce.

He has been very active in community service, particularly

in community development and youth employment. During the recent recession he initiated Project Employ Youth, which in 18 months placed more than 1000 young Australians in their first jobs.

With an extensive network of contacts in Asia, Dr Tan was instrumental in the development of the sister state relationship between Western Australia and East Java Province of Indonesia and Zhejiang Province of China.

For his many contributions to Australia's international relations and to the community, Dr Tan was made a Member of the Order of Australia, and for his work in youth employment he was made Citizen of the Year for Community Services. He also received an Advance Australia Award for excellence in communication between cultures and for commerce.

Dr Tan is married with two adult children.



Aileen Donoghue with Dr Roy Green

## Farewell Aileen

BY KAREN ROBINSON

**After 23 years in CSIRO, Aileen Donoghue, who had been personal assistant to the last four Chief Executives, decided to hang-up the phone, close the diary and take a well-earned rest. Aileen retired from CSIRO in February.**

On January 25 a large crowd gathered at the Limestone Avenue site for a special morning tea in her honour.

Chief Executive Dr Roy Green opened the proceedings, saying what a joy it had been having Aileen look after him for the past year. He highly valued the close working relationship with one of the most popular people in CSIRO.

Pam Dovey, from Ministerial and Government Business, a colleague and personal friend,

spoke of Aileen's great 'corporate knowledge' and said she was like a terrific reference book, always on hand with the right answers.

Phillip Moore, from Government Business and International Scientific Liaison, said: "Aileen is an amazing diplomat, who knows what to say at just the right time, and does it with the utmost courtesy. She has a generous nature, a great sense of humour and endless patience."

"I also enjoyed Aileen's humour," said Jenifer North from Corporate Communication. "In times of crisis and when all else failed, Aileen and I shared a burst of hysterical laughter to relieve the tension."

Aileen was presented with a commemorative vase and a card depicting all the Chief Executives she had served in her time at CSIRO.

## CSIRO staff news on the Web

**Corporate Communication is running an experimental staff bulletin on CSIRO's Web Pages for the next few months.**

The aim is to fill the gap between the bimonthly *CoResearch* and the urgent/important 'csiro-all' email methods of providing information to staff.

*Staff News* has a temporary home in the Corporate part of the CSIRO Services section, at <http://www.csiro.au/services/bulletin/bulletin.htm>.

If it works it will have a more suitable home in the re-vamped CSIRO World Wide Web pages, which are coming soon.

Jenifer North, who is running this experiment, says:

"Our aim is to provide a news service that staff turn to for general news about CSIRO or if they hear a rumour about something that affects all of CSIRO, good or bad."

Jenifer is seeking feedback and potential news items. Contact her by fax (06) 276 6641, phone (06) 276 6545, or email [J.North@cbr.csiro.au](mailto:J.North@cbr.csiro.au).

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# CoResearch

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CSIRO's staff newspaper



## Chiefs see early benefits from alliance structure

BY HERMINA MARTZ

Three Chiefs who helped design the new Alliance structure of CSIRO are excited by the increase in interactions already taking place between Divisions.

The three Chiefs — Dr Jim Peacock, Dr Ron Sandland and Dr Tom Spurling — have told *CoResearch* that the initial steps in restructuring CSIRO are already delivering benefits.

They say the key to the success of the new structure is for everyone in the Organisation "to keep it simple".

Dr Jim Peacock, Chief of the Division of Plant Industry, says he is "very excited about the vast improvements to CSIRO".

There are two big differences between the new Alliances and the old Institutes, according to Dr Peacock, and they constitute a real change in structure.

First, Divisions are not restricted to one Institute, but are members of one or more Alliances, with the number of Alliances determined by the nature of its Divisional research.

Second, whereas Institutes and the earlier structure encouraged a large effort on marginal funding of priorities, the new structures recognise that most changes occur through the willingness of scientists to tackle new problems.



Dr Jim Peacock

Dr Ron Sandland of the Division of Mathematics and Statistics sees a major cultural change coming to CSIRO with the new structure, where R&D collaboration within the Organisation will be more the rule than the exception.

"Although collaborative R&D was possible beforehand and lot of it took place, the new structure will produce a special mechanism to consider and discuss possibilities and ultimately more collaboration between Divisions will eventuate," he says.

The primary benefit of the restructure is "enabling people to talk across the traditional boundaries in CSIRO and to select teams from across the



Dr Ron Sandland

organisation to handle a broader class of problems, meaning system level problems".

Chiefs with their divisional responsibilities have always had a key position in the structure and work of CSIRO and will continue to play an important role as the heads of Divisions where R&D are carried out.

The role of Chief, in particular, will change in the new structure, because rather than being accountable to a single line manager — the former Institute Director — Chiefs will be responsible for delivering research outcomes through a number of sectors and Alliances. Each of these will be headed by a Chief and Deputy Chief Executive respectively.



Dr Tom Spurling

Since each Chief will be operating in a number of sectors they will be responsible for delivering research as agreed with their fellow Chiefs. They will rely on other Chiefs within sectors of any Alliance.

Dr Tom Spurling, Chief of the Division of Chemicals and Polymers and chairman of the planning taskforce for the restructuring, says: "The structure is designed to force all Divisions to work with others in trying to come up with the people and projects most appropriate to solving problems in the nation."

He says the restructure will benefit CSIRO's budget process, providing a "more efficient and simpler method of allocating

budgets, with Divisions having high accountability for their own budgets".

Dr Spurling says the Deputy Chief Executives, vis a vis their previous role as Institute Directors, "will lose their vested interest in competing for budgets, as now they are involved with the allocation of money and are not recipients of funds".

Dr Peacock says this will encourage a corporate approach by the Deputy Chief Executives rather than bottling up Divisions within a single Institute.

"The new dynamic Alliance structure allowed for change and was a meaningful nexus" for Divisions. Belonging to more than one Alliance was "absolutely natural, perfectly operationable".

Dr Peacock says staff are expecting a "better working environment" and this means Chiefs and the executive team have a "huge responsibility" to deliver the goods.

Dr Sandland sounds a note of caution: "Tackling key national problems depends on establishing top multi-disciplinary research teams and requires work," he says.

(Readers are invited to have their pennyworth on the restructure by sending letters to the editor. A longer write-up of the interviews will appear on *csiro-forum*. See page 8.)

## Five Divisions on show at Wool Expo

BY HERMINA MARTZ

On-the-spot faecal egg counts were a real winner at this year's Armidale Wool Expo, held from May 10 to 12.

The Division of Animal Production provided the counts for farmers who brought in samples of fresh sheep droppings.

Worms cost Australian farmers about \$210m a year in lost production.

The Division was one of five CSIRO divisions that participated in the Wool Expo and contributed to "CSIRO's biggest-ever rural display at Armidale", according to David Paull, liaison officer with the Division of Animal Production.

The strong presence of Australia's largest R&D organisation provided an impressive showcase of some of the organisation's latest research for the rural industry.

CSIRO experts were on hand to answer questions and help farmers.

The research programs presented included current and new CSIRO strategies for internal parasite control in sheep; biological control of noxious weeds; better management of phalaris; disease and rabbit control; and a range of new woollen products.

The NSW launch of *continued next page*



Pat Naughtin of the Division of Wool Technology shows a Sportswool garment to a Wool Expo visitor

The new Federal Science and Technology Minister, Peter McGauran, has promised to consult widely with the relevant agencies, including CSIRO, in preparing the Government's vision for research and development.

"The task of outlining which research areas best serve Australia and deserve further enhancement will possibly be one of my most difficult challenges and will require a combination of what the Government, the market and the science community itself are seeking," he says.

"My key role is to ensure the process is carried out correctly, but also, that agencies best able to set their own priorities are not shut out."

Mr McGauran says it is unfortunate that a feeling of mutual suspicion has built up between the Government and research agencies over recent years.

"It is my intention to break down the walls and replace them with a regime of cooperation," he says

The Minister wants to make CSIRO leaner and more industry-oriented, but says the agency itself has to lead the way. He has applauded the organisation's move towards a managerial framework

# New Minister pledges wide consultation

consisting of industry alliances and sectors.

"The new arrangements will free up vital research income and therefore reflect a sound, simpler system which will ensure full accountability across the spectrum of CSIRO's activities," Mr McGauran says.

"The problem is too many people believe CSIRO is the research equivalent of the ABC and is owned by all Australians, so is at everybody's beck and call.

"While it is taxpayer funded and therefore ultimately accountable to the public, it is my intention to give the agency a little more latitude in its decision-making."

The 40-year-old National Party MP grew up on a cattle farm in Gippsland in east Victoria. Before entering federal politics in 1983, he practised law with a local firm, specialising in criminal and family law.



Peter McGauran: More latitude in CSIRO decision-making

In 1988 he was appointed Shadow Minister for Science and Technology, and spent five years in the job. "So I am by no means a newcomer to the area," he says. "I know where the strengths and weaknesses currently lie. I am also aware of the need for certainty and stability."

Mr McGauran believes one of the most daunting tasks facing him is to make science more attractive — firstly to local industry and secondly to young people deciding on a career.

"The low level of private sector investment is what's hindering Australian research and development," he says. "Industry needs to be shown the reasons why it is in its interests to play a greater role. Research agencies need to set the bait.

"International firms have realised what's on offer here, many of them are relocating key personnel here, tapping into our resources and taking our technology back overseas.

"Unfortunately, they are also taking away some of our best young scientists. The Government and the entire science and technology community need to work together to stop the 'brain drain'."

As the new Government attempts to find \$4 billion in savings, every Department, including Science and Technology, will be asked to cut costs. But Mr McGauran says major research projects will continue as before.

"I know some of the decisions we are going to make won't be universally welcomed, but the science community shouldn't underestimate the dimensions of the financial problems left behind by Labor," he says.

"I believe the science community as a whole understands the position we are in and accepts that it has to play its part.

"No portfolio is being spared from this budget process, but scientists are generally tougher, smarter and much more realistic today about fiscal responsibilities. They are not the self-indulgent prima donnas they were once accused of being."

Mr McGauran says he remains as optimistic as he has always been about the ability of Australian scientists to contribute to the country's economic growth and development.

"And I can reassure the scientific community the Government's support for research and development will continue to underpin the push to achieve these goals," he says.

## Learning more about Antarctic currents

By CRAIG MACAULAY

Scientists are revealing more about the world's largest ocean current with the recent completion of a further stage in a major international project studying the Antarctic Circumpolar Current.

Using the French Antarctic supply ship *L'Astrolabe*, the project started in 1992 and involves scientists from Australia, the United States and France.

The current is estimated by oceanographers to be 150 times the total flow of all the world's rivers into the sea. It links the Indian, Atlantic and Pacific ocean basins, and therefore plays a significant part in regulating the earth's climate.

Dr Steve Rintoul, a scientist with CSIRO Oceanography and the Antarctic Cooperative Research Centre in Hobart, says the project aims to monitor how and why the strength of the current varies with time.

"What makes this study unique is that it is the only experiment in which repeat measurements of ocean temperatures are being made across the Southern Ocean.

"This study is allowing us to really pin down how the current varies with time and better understand the implications for change in global climate due to an enhanced greenhouse effect," he said.

A French oceanographer, Dr Jean Rene Donguy, was aboard *L'Astrolabe* for its third voyage to the Antarctic this season. By using simple, inexpensive

probes during the voyage, ocean temperatures across the Southern Ocean were measured at regular intervals.

Dr Rintoul says a similar experiment with the assistance of merchant shipping has been under way for many years in the tropics, providing data on which forecasts of El Nino are based. The study is the first attempt to extend this monitoring network to the Southern Ocean.

"One important reason to monitor ocean temperatures is to see if the ocean is warming or cooling. Identifying temperature trends is difficult, because the natural system varies from year to year," he says.

"Measurements such as these allow us to determine the short-term natural variability which we need to know

before we can identify longer-term trends."

Dr Rintoul says scientists are seeing some of the same features in the simple measurements obtained from Antarctic supply ships that they observe in the very comprehensive, but more expensive and thus less frequent, voyages on research vessels.

"The same trends can also be seen in observations of sea surface height made by satellite and the field measurements taken on these research trips helps 'calibrate' the satellite measurements," he says.

"Since the satellite provides us with a global 'snapshot' of the ocean every 10 days, we can get better coverage in space and in time than we could ever hope to get using ships."

## Five Divisions on show at Wool Expo

from previous page

DrenchRite® at Wool Expo was a major event for the Division of Animal Production.

DrenchRite®, a new test to detect drench-resistant worms, will help farmers wage war on worms by enabling them to use drenches more effectively and efficiently.

The fine-tuned test has been developed by the Division's McMaster Laboratory for use in

vet labs and is now available from a Sydney-based company, Horizon Pty Ltd.

At the Expo the Division of Entomology featured a number of biocontrol measures for noxious weeds, such as Nodding and Scotch Thistles, as well as Paterson's Curse.

Scientists promoted the benefits of earthworms and provided information on how to identify and manage native

insect herbivores on eucalyptus trees.

Dr Rex Oram from the Division of Plant Industry attended the Expo to show farmers how to get the best out of phalaris pastures and to increase pasture returns and lifespan.

A Division of Animal Health researcher presented a discussion on a major animal health problem in sheep and cattle, John's Disease, and

talked about the pertinent issues, current research and a national accreditation program.

Niall Byrne, communication manager with the Division of Animal Health, addressed the Wool Expo Industry Seminar on the spread of the rabbit calicivirus.

The Expo also attracted the Chief of the Division of Wool Technology, Dr Ken Whiteley, who took the opportunity to

promote the new Sportwool fabric developed by the Division.

The advanced fabric, designed to keep athletes cool, comfortable and dry, is being tested by Australian Olympic athletes bound for Atlanta.

Wool producers and the general public showed great interest in Sportwool, which was developed with the support of the International Wool Secretariat.

# More tests on calicivirus

In the past few months rabbit calicivirus has slipped from the national headlines, but behind the scenes there is still a great deal happening.

In April, the Minister for Primary Industries and Energy, John Anderson, announced that a co-ordinated national release of rabbit calicivirus would not occur this autumn.

He said he agreed with an interim report from BRS that there was sufficient information to declare rabbits a target organism under the Biological Control Act 1984, but that further assessment was necessary before declaration of RCV as an agent organism could be recommended.

Meanwhile the virus is spreading, with reports from New South Wales, Victoria, South Australia and Western Australia; in Queensland RCD

remains confined to the south-west of the State. CSIRO and State government scientists are assessing the impact of the virus in affected areas.

Mr Anderson said there was a fundamental need to maintain public confidence in the decision-making process for biological control agents.

"RCV is endemic in Europe, Asia and North Africa and there is no evidence of it affecting people or animal species other than European rabbits. Research conducted in Australia and overseas has been reviewed by the BRS.

"Nonetheless, the Department of Health and Family Services has advised the BRS that it wants to see the results of further study to confirm there is no effect on humans. This will be conducted.

"In addition, koalas, wombats and echidnas will be tested for possible susceptibility to infection. While tests on other



David Lord at Thackaringa Station near Broken Hill estimates that RCD eliminated 95% of the million-plus rabbits on his property

Australian native fauna have not shown evidence of infection, these prominent species must be tested for reasons of public confidence."

CSIRO AAHL at Geelong is conducting the testing in its

high-security animal rooms.

AAHL veterinary virologist Dr Harvey Westbury said that when the three species had been tested, the total number tested for susceptibility to RCD would stand at 48 (31 in Australia, two

in New Zealand and 15 overseas). All tests have confirmed that rabbit calicivirus is specific to European rabbits.

The virus can be spread in a number of ways, including rabbit-to-rabbit contact or mechanical spread by birds, insects and even people, via vehicles for instance. Which is responsible for its spread across Australia in recent months is yet to be determined.

A model developed by the CSIRO Division of Wildlife and Ecology using climatic data may prove to be an accurate predictor of the effectiveness and movement of RCD.

Australia's foremost rabbit ecologist, Dr Brian Cooke, is using the CSIRO-developed CLIMEX database in developing the model.

For more information on rabbit calicivirus visit the "rabbit pages" in Newline on CSIRO's Corporate web site.



Representatives of Du Pont visit the Division of Chemicals and Polymers to discuss the strategic alliance and to present a cheque to Dr Tom Spurling. From left, David McCullough, Operations Manager, CSIRO Chemicals and Polymers; Leo Hyde, R&D Manager, Du Pont Australia; Bob Matheson, Technical Manager, Du Pont Automotive Products, Pennsylvania; Dr Tom Spurling, Chief, CSIRO Chemicals and Polymers.

## Polymer breakthrough

BY GERRY SCHELTINGA

Research at the Division of Chemicals and Polymers has led to the development of a world-first technique in the synthesis of engineered resins.

The breakthrough is the latest in a number of discoveries resulting from ten years of work by scientists at the Division.

CSIRO is collaborating with Du Pont Australia, which holds world-wide patents for the new technology, and will be concentrating initially on developing automotive paints, other coatings and adhesives.

Dr Ezio Rizzardo, Chief Research Scientist and Manager

of the Polymer Production and Processing Program, has been awarded the Royal Australian Chemical Institute's 1996 Applied Research Medal for his work leading up to the development of this technique. Other major contributors to the research were Dr Graeme Moad, Dr San Tang and Dr Gordon Meijs.

The new technique allows control of the size and shape of polymers, producing fewer waste materials and opening up a whole new range of commercially viable processes.

Dr Rizzardo says the properties of polymers depend on size, shape and chemical composition and controlling

these has until now been very difficult.

"This new technique allows us for the first time to economically make a wide range of block copolymers," he says. "These are formed by linking together, end to end, two or more sets of polymers of different composition.

"By controlling the size, shape and end group functionality we can make polymer structures that have specific properties and applications. Though we will continue to explore the more fundamental aspects of the chemistry we will also be developing new products and processes for specific markets."

## Moth takes on weed

BY NICK GOLDIE

A small French moth has been turning up in all the rural media.

The Horehound Plume Moth won't eat a hole in your favourite woolly jumper. But it will lay eggs on the noxious weed horehound, a pest of the wool and meat industries in south-eastern Australia.

The moth was released in April at a trial site on private land at Michelago in NSW, 60 km from Canberra. Other trials are in Victoria and South Australia.

According to John Weiss, of the Keith Turnbull Research Institute, the weed costs the wool industry about \$700,000 a year. "It's a very invasive weed, with a bitter taste which affects meat quality, and persistent burrs which affect wool," Mr Weiss says. "Ironically, horehound was

introduced in the 1800s for erosion control and as a medicinal herb."

Dr Dave Briese of CSIRO's Division of Entomology says horehound has flourished because it has no natural enemies. In the Mediterranean area where it originated, it has a variety of predators.

Approval for the release of the moth was given by the Australian Quarantine Inspection Service and the Australian Nature Conservation Agency in 1994.

The horehound biological control program is supported by the International Wool Secretariat, CSIRO and the CRC for Weed Management Systems, the South Australian Animal and Plant Control Commission, and Victoria's Department of Conservation and Land Management.

## Sir Ian McLennan Award

Nominations are now open for the Sir Ian McLennan Achievement for Industry Award.

The award goes to CSIRO scientists and engineers whose achievements have been of benefit to Australian industry. Winners are given a grant of up to \$15,000 for an overseas study tour related to their achievement. They are also presented with the Sir Ian McLennan Medal at a lunchtime ceremony, this year in Melbourne.

In these cost-cutting times the award should be quite a help to those trying to catch up with overseas developments, or to increase even further the returns on their development in this country.

The winner in 1995 was Dr Bruce McAuley Thomas from the Division of Radiophysics/Australia Telescope National Facility, for his contribution to the development of antenna technology and to the establishment of a new high-technology industry.

Nominations close on June 30 and the winner is expected to be announced in October. More details are available from Ms Karen Robinson, CSIRO Corporate Communication, PO Box 225, Dickson, ACT 2602; phone (06) 276 6108 or fax (06) 276 6641.

# Short shots

## Malaysian research contract

CSIRO has been commissioned by the Standards and Industrial Research Institute of Malaysia (SIRIM) to help develop computer software for the Malaysian Uniform Building By-Laws.

The six-month research contract will convert the Malaysian Building By-Laws into a user friendly computer package to enable architects, engineers, building surveyors, builders and developers to quickly and accurately apply the by-laws and speed up the building approvals process.

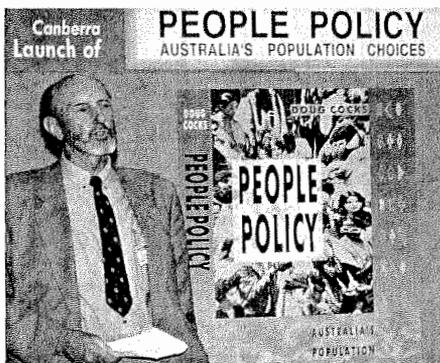
The Malaysian system will be based on BCAider, which was developed by CSIRO as an expert system for the Building Code of Australia (BCA) in 1991.

Dr Ron Sharpe, Industry and Science Manager and the original developer of BCAider, says the software has helped a large number of Australian professionals to find their way through the sometimes complex BCA.

"This system will help the Malaysian building and construction sectors to speed up overall project implementation while enhancing the safety and quality of buildings," said Dr Sharpe. "It will also have the same interface and operation as BCAider, providing familiarity to Australian companies working in Malaysia."



Successfully transferring technology: From left, Dato' Dr Ahmad Tajuddin Ali and Aziz Mai, representing SIRIM, and Dr Ron Sharpe and Larry Little of CSIRO



Doug Cocks at the Canberra launch of his new book

The A\$360K software development agreement was signed by Dato' Dr Ahmad Tajuddin Ali, Director-General of SIRIM, and Larry Little, Chief of CSIRO's Division of Building, Construction and Engineering, during a conference on Pacific Building Standards held at the Gold Coast.

"The agreement with SIRIM is a clear recognition of our expertise in this area," Mr Little says. "The BCAider software has already won six industry awards in Australia and will now bring in export income."

## Book canvasses population options

Doug Cocks of the Division of Wildlife and Ecology describes his new book, *People Policy: Australia's Population Choices*, as an exercise in bringing scientific attitudes and expertise to bear on the analysis of an important public policy issue.

He foresees this approach as becoming increasingly common in a CSIRO striving to make its presence felt in our fast-changing society.

Doug's involvement with public policy began when he was seconded as an expert consultant for six months in 1994 to Barry Jones' parliamentary inquiry into Australia's carrying capacity.

Doug used his wide knowledge of Australia's resources and their management to write a draft report for the inquiry and his book makes extensive use of submissions to the inquiry.

The book does not shy away from drawing conclusions. After assembling and reviewing economic, resource, environmental, humanitarian, social and geopolitical arguments, it concludes that "a much stronger case can be made out for a population of about

the present size rather than a much larger population".

The book, published by University of New South Wales Press, was launched by Bob Carr, Premier of New South Wales, in Sydney on March 18 and by Ian Lowe, academic scientist and commentator on science policy and administration, in Canberra on March 14.

## Setting us straight on grapes

Australia's history of confusion about grape varieties is now being corrected thanks to *Wine Grape Varieties of Australia* (\$39.95, CSIRO Publishing, 1996).

Written by George Kerridge, from the Division of Horticulture, and the late Allan Antcliff, the book contains descriptions of 88 varieties of wine grapes — covering all those commonly grown here and others with a strong future here.

The book features colour photographs of leaves, growing shoots, canes and fruit, and describes the current world status of each variety.

In the past, varieties have been wrongly identified or introduced under several different names. Now varieties can be identified from DNA and the varieties that have been profiled are listed in the book.



## Hospital software joint venture

Freslin Strategic Management Systems, an Adelaide facility planning group, has signed a joint venture agreement with the Division of Building, Construction and Engineering for the use of HOSPIM, software developed by researchers Dr John Roy and Miles Anderson.

It is now an important element in Freslin's program named Projection Wizard, which efficiently allocates resources within the health care industry.

Projection Wizard is an interactive computer-aided decision-making system for hospital planners. It forecasts changes in the distribution of patients to hospitals and changes in the mix of specialties in hospitals.

Interactive GIS displays highlight the social and planning consequences of different scenarios, enabling base resource allocation decisions to be made.

# Scientists call for polluter-pays reforms

The threat posed to human health, groundwater and soil quality, and ecological processes by contaminated sites is one of the most important issues facing governments and communities, according to two leading scientists.

In a joint statement, the Director of the Cooperative Research Centre for Soil and Land Management, Dr Ann Hamblin, and the chief of the CSIRO Division of Soils, Dr Roger Swift, said the magnitude of the problem had been detailed at the recent international conference on contaminants and the soil environment in Adelaide.

At the conference, 230 delegates from 25 countries were told that the exact number of contaminated sites in Australia is unknown but almost certainly exceeds 60,000.

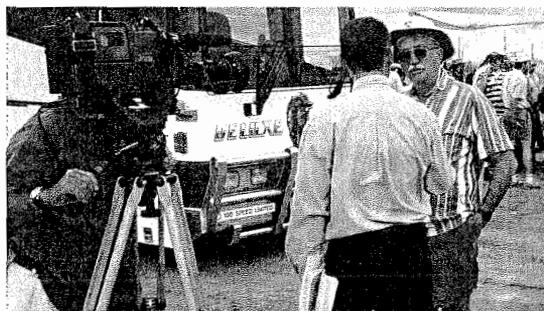
In the US, an estimated 400,000 waste disposal sites need remedial action. The cost over the next 20-30 years might exceed \$US1 trillion.

Widespread contamination of soil and water was reported by delegates from other countries, including those in Asia.

Dr Swift and Dr Hamblin said the contamination took many forms, including pesticides, chemicals, toxic metals, fuel spills and residues from gas works, tanneries and cattle dip sites.

They backed the proposition put at the conference that to help clean-up sites in Australia, reforms to the present polluter-pays system are needed.

This proposition came from the Dean of the Law Faculty at Adelaide University, Associate Professor Robert Fowler, who told delegates that although Australia operated a polluter



Media focus: Professor Malcolm Sumner (University of Georgia), world authority on agricultural contamination and degradation, is interviewed by Channel 9 on a field trip to examine contaminated land redemption during the Adelaide conference

pays principle, often the polluter was hard to identify or could not afford the cost of remediation.

Professor Fowler said that in the US, a tax on chemical companies was paid into a fund to help clean contaminated sites.

"That type of funding could be investigated in Australia,

with the fund being used in combination with contributions from polluters," Professor Fowler said. "In fact the first port of call (for payments) would be the polluter."

Drs Hamblin and Swift said the expertise of Australian scientists in identifying sources

of contamination and developing strategies for remediation was apparent at the conference.

These skills and experience included monitoring of surface and groundwaters; cooperation with industry to ensure contamination limits in food were not exceeded; identification of heavy metal pollution; safe disposal of wastes; and the social, health and legal issues related to soil contaminants.

Considerable demand for this expertise was expected from the Asia-Pacific region. Drs Swift and Hamblin said governments and industries in this region needed to set in place the structure, standards and monitoring systems to ensure the mistakes of the past were not repeated.

The Soil Contamination, Remediation and Food Quality program of the CRC was well placed to help in the development of such systems.

# Entomology opens its doors

BY JENNY GOLDIE

As part of the Australian Science Festival, the Division of Entomology opened its doors to school groups on Friday, April 19, and to the public on Saturday and Sunday, April 20-21.

This is part of a tradition in the Division to participate in events designed to showcase its research and development activities to the community.

This year, visitors were invited to see exhibits, in four large tents on the front lawns, that focused on four themes relating to the Division's research: Biodiversity, Environmental Management, Clean Food and Pests. They could also visit the Electron Microscopy laboratories, view an excellent art exhibition of insect paintings by Melbourne-based artist Sue Maddern, walk through the nematode laboratories, listen to talks on genetic engineering and get



Deidra Shears and Dr Roger Farrow with the leaflets about eucalypt insect pests launched during the Division of Entomology Open Days

involved in interactive computer displays.

In addition, the collection halls of the Australian National Insect Collection (ANIC), one of the world's great collections, were open to the public. As well as the nine million dead insects in ANIC, there were numerous live insect displays, including butterflies, stick-insects, ants, termites and spiders. There was

so much to see, in fact, that one woman took four-and-a-half hours to walk through!

The Open Days were launched by former Olympian and celebrated naturalist and businessman John Landy, in front of an audience of about 80 stakeholders, politicians, embassy officials, bureaucrats and CSIRO personnel. Guests included the Shadow Minister

for Science, Martyn Evans; the Leader of the Opposition in the ACT, Andrew Whitecross; the Ambassador for Denmark, HE Mr K. Lund-Jensen; and CSIRO Deputy Chairman Mr Doug Shears and his wife Deidra.

Divisional Chief Paul Wellings introduced the new CSIRO Chief Executive, Malcolm McIntosh. He talked about the role of disciplinary research Divisions and noted that Entomology will deliver its research to 11 sectors.

Dr McIntosh's comments were followed by the launch of a set of leaflets about eucalypt insect pests, designed by Divisional entomologist Roger Farrow and funded by the Rural Industries Research and Development Corporation (RIRDC).

Mr Cuiffetelli, RIRDC's Acting Managing Director, said "Insect pests threaten the viability of on-farm trees and eucalypt plantations. The leaflets can be used by those involved in landcare and tree-

planting. They are an important initiative in RIRDC's efforts to manage insect pests on farms, reduce the use of pesticides and to combat the spread of rural die-back."

John Landy paid tribute to the first class science being undertaken by the Division of Entomology. "The Division has played a vital role in both Australia's science and Australia's economy since it was founded in 1926. Today's research continues in that tradition.

"For instance, current work by Dr Peter Atkinson here at the Division and his colleagues at Maryland University offers a future in which insect pests may be controlled by genetic means, rather than by chemical insecticides."

John Landy praised the work of Divisional programs such as research on insect pests of stored grain; integrated pest management in primary production; and the biological control of insect and plant pests.



Early learning: Guests at the Food into Asia breakfast in Sydney

## Food into Asia

CSIRO hosted a breakfast at the Sydney Hilton on April 12 to brief food industry executives on the benefits of the Food into Asia program.

The program, a CSIRO-government initiative, aims to increase the level of Australian food exports to Asia by providing a \$6.5 million 'subsidy' for research conducted with CSIRO. It is intended to help Australian companies penetrate high entry barriers to, or extend and improve their existing operations in, complex and heterogeneous Asian markets.

"We were delighted to get nearly 60 managing directors, export directors and other senior executives at the breakfast," says Food into Asia marketing manager Judy Marcure.

"We were fortunate to have at the breakfast an expert on the Asia-Pacific economy, Professor Peter Drysdale of the ANU, to talk about the economic

changes that are making that market so attractive to the Australian food industry."

Breakfast host Chris Mallett, Agribusiness Alliance Deputy Chief Executive, says Professor Drysdale's presentation provided the 'why?' for looking to Asia for the program and CSIRO presentations provided the 'how?'.  
"We promoted all of CSIRO's food-related research capabilities by aligning them along stages in the food industry business system, not by our own structural boundaries. The Food into Asia program has taken the 'one-stop shop' approach from its inception."

Under the FIA program, CSIRO is matching every dollar a participating food company spends on research to improve its exports to Asia. Industry partners may also be able to access tax advantages for research undertaken with CSIRO.

Visitor response forms at the breakfast showed a high level of interest in the program.

## Green Machine to go national

BY HERMINA MARTIZ

Unique gene technology education programs developed by the Green Machine Science Education Centre are to be distributed Australia-wide.

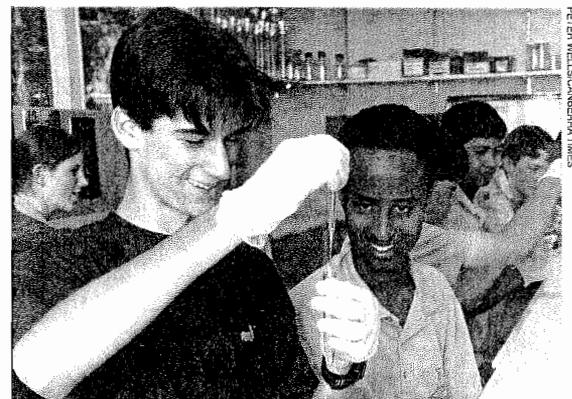
The Green Machine Centre, at CSIRO's Black Mountain site in Canberra, is a joint project of CSIRO Education Programs, the CRC for Plant Science and the ACT Department of Education.

The Centre has developed a successful schools program, "Gene Technology in Action", which is a laboratory workshop where high school students and teachers gain direct experience with the tools and techniques of genetic engineering.

They also have the chance to examine the social and ethical issues raised by the technology.

More than 1100 senior secondary students from the ACT region have attended half-day gene technology workshops at The Green Machine and more than 290 teachers have attended full-day training programs.

The manager of the Green Machine Science Education Centre, Graham Smith, says research scientists from CSIRO and the CRC for Plant Science have played a key role in



Early learning: Students gain hands-on experience in gene technology at the Green Machine Science Education Centre

implementing these workshops for students and teachers.

"The Green Machine's 'Gene Technology in Action' programs proved so effective in Canberra that the joint partners who resource the Centre have joined forces to distribute the program nationally," he says.

A modified version of the program was so popular in trials at the Melbourne CSIRO Education Centre that the CRC for Plant Science and CSIRO Education programs have confirmed they will provide resources to duplicate and transport the program to Sydney, Townsville, Adelaide

and Darwin CSIRO Education Centres.

Graham Smith says the Centre has recognised the need for secondary science education to respond to the growing importance of gene technology.

He says special techniques and equipment developed by molecular biologists are now being applied to a much broader range of problems.

For example, plant breeders, forensic scientists, medical researchers and archaeologists routinely apply methods and use instruments that were previously limited to specialist molecular biologists.

# Two win accolades from Royal Society of NSW

Two CSIRO scientists have won strong accolades from the Royal Society of New South Wales.

Dr Tony Murphy of the Division of Applied Physics and Dr Richard Manchester from the Australia Telescope National Facility were recognised for their contributions to excellence in Australian science earlier this year.

Dr Murphy was awarded the Edgeworth David Medal, which acknowledges major scientific research of a worker under 35.

His theoretical work on diffusion in plasmas has greatly simplified the treatment of high-temperature gas mixtures. He has also developed plasma diagnostic techniques using laser-scattering methods.

Dr Murphy has applied both aspects of his work to the development of a computer model that is being used to optimise the PLASCON waste disposal technology. PLASCON has been jointly developed by



Dr Tony Murphy adjusts laser diagnostic equipment

the CSIRO Divisions of Manufacturing Technology and Applied Physics and Siddons-Ramsay Plasma Pty Ltd.

It has already been installed in the Nufarm chemical plant near Melbourne and another PLASCON unit will soon be constructed near Melbourne to destroy Australia's stockpile of ozone-depleting substances.

Dr Manchester was awarded the 1995 Walter Burfitt Prize,



Dr Richard Manchester: leads team studying radio pulsars

which is given every three years to a scientist in Australia or New Zealand whose papers published in the preceding six years are deemed to be of the highest scientific merit.

The prize was endowed in 1927 by Walter Burfitt, a surgeon with a life-long interest in science.

Dr Manchester studies radio pulsars — tiny spinning stars that give out beams of radio waves. As the star spins, its

radio beam flashes across the Earth, and we see a 'pulse' of radio waves.

For the past six years Dr Manchester has been leading an international team studying pulsars, mainly with CSIRO's Parkes radio telescope. He received a CSIRO Medal for this work in 1993.

The team has systematically surveyed the southern sky for pulsars, especially for the very fast 'millisecond' pulsars, which spin hundreds of times a second.

By 1993 Dr Manchester and his colleagues had discovered about half of the 600 pulsars known (today we know of about 740 pulsars), and more than half of the known millisecond pulsars, including the closest and strongest millisecond pulsar found so far.

Dr Manchester and his colleagues are now working on a number of pulsar projects including a collaboration with CALTECH to refine the timing of pulsar signals.



Dr Oliver Mayo

## Genetics work recognised

Dr Oliver Mayo, Chief of the Division of Animal Production, was elected in May as a Fellow of the Australian Academy of Science, for his contribution to human genetics, plant and animal breeding.

Dr Mayo has combined his outstanding skills in statistics and genetics to show the role of major genes in such complex variables as body or wool growth rate. His research on the barriers to self-pollination in plants is highly regarded.

"To have one's work recognised in this way by the Academy is indeed an honour," Dr Mayo says. "Understanding genetic factors involved in animal production is essential if we are to achieve further gains in our livestock improvement programs."

Agribusiness Alliance Deputy Chief Executive Dr Chris Mallett said: "CSIRO is fortunate to have scientists and senior managers of Dr Mayo's calibre. The Academy's recognition is applauded by the Organisation and by Dr Mayo's colleagues."

Dr Mayo has a DSc and a PhD from the University of Adelaide and became Chief of the Division of Animal Production in 1989. He has overall responsibility for research on Australian livestock production systems, including breeding, nutrition, sustainable grazing systems, wool quality and the use of knowledge in decision support software.

An internationally recognised geneticist, Dr Mayo is also known for his books on human genetics, plant breeding and evolution as well as more than 100 papers on his research. His authoritative book on plant breeding has been translated into a number of languages. In 1992, he was appointed as a Foreign Member of the Russian Academy of Agricultural Science.

Dr Mayo has written a book on Australian wine, as well as a biography of a 19th century writer of detective stories.

# Distinctions for Plant Industry scientists

Two scientists from CSIRO Plant Industry achieved distinctions in May. Dr Jeremy Burdon was elected to the Australian Academy of Science in recognition of his outstanding contribution to plant research, and Dr Jan Anderson was elected to the Royal Society of London.

Plant Industry Chief Dr Jim Peacock says Dr Burdon's research has combined elements of plant pathology, ecology and genetics to make significant contributions to the

understanding and management of both agricultural and natural ecosystems.

The main focus of Dr Burdon's work has been the role diseases play in natural communities and in agriculture.

Dr Burdon has worked at CSIRO Plant Industry in Canberra for the past 18 years. He has also spent time working in research institutions in North Wales, the United States and Sweden.

Commenting on Dr Jan Anderson's election to the Royal Society of London, Dr

Peacock said: "Dr Anderson has made an outstanding fundamental contributions to plant science, particularly important discoveries in the area of photosynthesis.

"In 1964 Dr Anderson and Dr Keith Boardman (past CSIRO Chief Executive) discovered that plants have two light reactors, rather than one — a finding that has led to future research showing how photosynthesis membranes function at the molecular level.

"Dr Anderson's subsequent research has helped understand

how plants capture and efficiently use sunlight whether they are exposed to shade conditions or bright light."

The Royal Society of London is a prestigious scientific institution that dates back to the middle of the 17th century and its fellowship comprises 1100 of the world's leading scientists.

Dr Anderson, an honours graduate of the University of New Zealand, gained her PhD from the University of California, Berkeley, in 1959. She was elected a Fellow of the Australian Academy of Science in 1987.

## Former staff recognised in 1996 Queen's Birthday honours list

Five retired CSIRO staff were among the recipients of the Queen's Birthday 1996 Honours Awards.

Dr Albert Rovira, former research scientist in the Division of Soils, was made an Officer in the General Division (AO). His award is for services to agriculture and soil science through research into soil organisms.

Dr Peter May and Mr John Tracey were made Members in the General Division of the Order of Australia (AM).

Dr May, former Assistant Chief of the Division of Horticulture, has been distinguished for services to viticulture and oenology through research and development.

Mr Tracey, former botanist in the Division of Forest

Research and the Division of Plant Industry, received his award for services to conservation and the environment, particularly tropical forest maintenance and planting in North Queensland.

Mr John Feehan, retired research scientist, and Dr Edgar Riek, former Principal Research Scientist, both of the Division of Entomology, were

awarded a Medal in the General Division (OAM). Mr Feehan was recognised for services to entomology, particularly for his work on dung beetles and his efforts to promote their use throughout Australia's farmlands.

Dr Riek received his distinction for services to entomology as well as viticulture.

# First computer on display

BY HERMINA MARTZ

Australia's first electronic stored program computer — the CSIRO-built CSIRAC — was on show this month at a two-day conference in Melbourne.

Originally called CSIR Mk1, the huge computer was among the first five in the world and executed its first program in 1949.

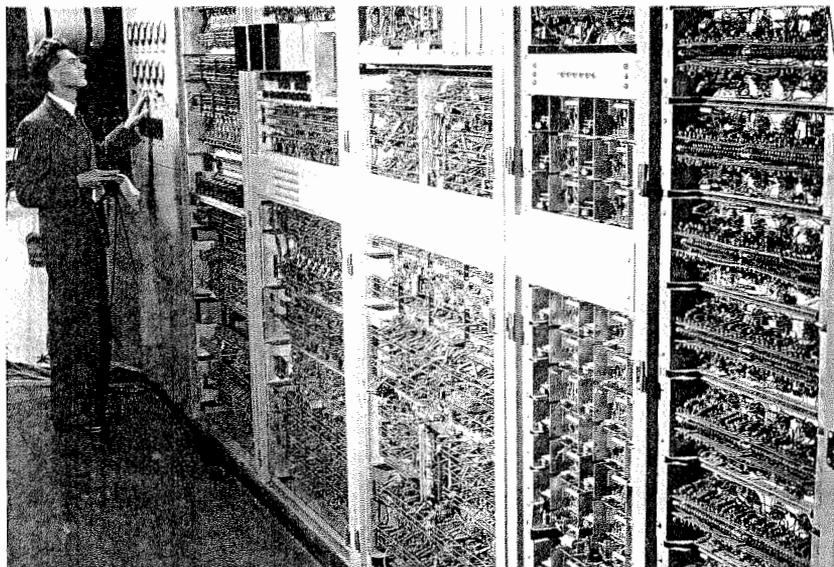
Built between 1949 and 1951, it followed overseas computers such as EDSAC at the University of Cambridge, the Ferranti prototype at Manchester, the ACE at the National Physical Laboratory, Teddington and BINAC at Remington-Rand, USA.

It was constructed by CSIRO's Division of Radiophysics in Sydney to the designs of Trevor Pearcey and Maston Beard.

The project started in early 1947. During World War II the Division had worked on radar implementation and gained considerable experience in electronic pulse techniques.

After the war, these specialised techniques were readily applied to digital computer design. So was born the project — in those days known as CICERO Mk1 — to build the first Australian designed digital computer.

Many difficulties were encountered, including the fact that the only electronic components available were those for standard radio applications, and the electronic valves used were those compatible with reasonable supply.



Trevor Pearcey and the CSIRAC computer: Modifications to the design gave it quite a speed for its day

When construction started, CSIR Mk1's main role was seen as a research computer for the investigation of programming techniques and electronic computer circuitry. No consideration was given to building a machine expressly for processing computational projects.

However, once in moderate running condition, at Radiophysics during the period 1951–1955, CSIR Mk1 was applied to many scientific computations arising in Sydney and other centres throughout Australia.

CSIR Mk1's original input was by means of 80-column punched cards. Later this was

altered to punch paper tape.

In 1954 it was decided to transfer CSIR Mk1 on indefinite loan to the University of Melbourne, and the computer was moved there the following year, and renamed CSIRAC.

On June 14, 1956, the CSIRAC Computing Laboratory was officially opened by the then Chairman of CSIRO, Sir Ian Clunies Ross.

CSIRAC was the first computer in Melbourne and the first to go into regular academic service. Modifications to its design gave CSIRAC quite a speed for its day.

The first project run on CSIRAC in Melbourne for an outside organisation was in

1956 when a program was written for the Housing Commission, containing a set of amortisation schedules.

A program run for the CSIRO Division of Building Research was used for the rigid frame analysis of large buildings.

CSIRO's connections with the computer continued with one of its scientists, Dr Geoffrey Hill, developing Interprogram, an automatic language for CSIRAC in 1960.

The first programming course for CSIRAC was held in early 1956 and was attended by staff from the University of Melbourne, CSIRO and other organisations and became a regular annual event until 1963.

Undergraduate courses in programming and machine logic were arranged for students of physics, engineering and mathematics, with practical experience on CSIRAC considered essential.

CSIRAC computed its last program for the University of Melbourne on November 24, 1964. It is now the oldest complete example of an electronic stored program computer left anywhere in the world.

To commemorate the historic opening of the CSIRAC Computing Laboratory, the University of Melbourne, in association with the Australian Computer Society and the Australian Computer Museum Society, hosted a two-day conference on June 13-14. It featured presentations from some of the computing pioneers who made Australia a world leader in the early stages of electronic computing development.

To coincide with the conference, an exhibition is showcasing CSIRAC and providing examples of other Australian computing devices (pre and post CSIRAC). For further information, send email to: acms@cascale.apana.org.au.

*(I am grateful to Professor Frank Hirst who allowed me to read his article "Farewell to CSIRAC" which appeared in the Victorian Computer Society Bulletin, Volume 3, Number 10, in February 1965. Professor Hirst supervised the dismantling of CSIRAC in Sydney in 1955 and its setting up in Melbourne. He is a former Professor of Computing Science at the University of Adelaide and a former Reader in Computing Science at Melbourne University, Ed)*

## Chief Executive's Study Awards announced

CSIRO Chief Executive's Study Awards are provided on an annual basis to allow opportunities for staff to gain training and experience relating to their careers.

Awards for 1996-97 have been granted to the following applicants:

**1. Nicola Bartone, Division of Biomolecular Engineering:** To work with Dr Ruedi Aebersold in the Department of Molecular Biology at the University of Washington in Seattle to learn techniques of protein microsequencing. Also to visit Hewlett Packard Headquarters, San Francisco, a major supplier of instrumentation to the Division, for discussions.

**2. Malcolm Lawn, Division of Applied Physics:** To visit the National Physical Laboratory (NPL), UK, to study the

techniques used in ion trapping experiments and experience working in another standards laboratory working on trapped ion frequency standards. Also to visit the Time and Frequency Section of the International Bureau of Weights and Measures (BIPM), Paris, to study the calculation and dissemination of the world atomic time scale UTC and experience the culture and methodology of BIPM.

**3. Rhys Leeming, Division of Oceanography:** To visit the Swedish Institute for Infectious Disease Control, Stockholm, to obtain first-hand experience of new sewage re-use technologies. Also to present a paper at the 7th International Symposium on "The Interactions Between Sediment and Water".

**4. Judy Marcure, Institute of Animal Production &**

**Processing:** To visit the USA and attend a course on "Mastering Technology Marketing" for R&D organisations and to work with Mr Bruce Davies on an 11-week secondment to the Technology Transfer Department at the Lawrence Berkeley National Laboratories. Also to visit the marketing manager and staff at the Technology Transfer Department of the Lawrence Livermore National Laboratories and to attend a Technology Transfer Society's annual meeting and conference on extension services, technology transfer trends, new technology transfer strategies and technology partnerships.

**5. Nasiha Nikolic, Division of Radiophysics:** To work with Professor Mosig of LEMA in Switzerland to carry out a joint project in the area of integrated

antenna systems at the LEMA laboratory.

**6. Paul Pavelic, Division of Water Resources:** To attend an International Symposium on Artificial Groundwater Recharge in Finland and present a paper entitled "The impact of two seasons of stormwater injection on groundwater quality in South Australia". To visit the Thames Water Resources Department to study the effects of ASR using treated effluent on groundwater quality, and review of operational sites. Also to visit Dr Jos Peters in the Netherlands and Professor Jesus Carrera in Spain who are active in water reclamation research, and to present talks on water quality guidelines for ASR.

**7. Peter Robertson, CSIRO Publishing:** To visit the Netherlands, UK, Canada and

the USA to learn of progress made in electronic delivery of journals on the World Wide Web, to discuss business and technical problems and their possible solution and to assess future trends in electronic publishing and their impact on traditional print form.

**8. Wolfgang Wanjura, Division of Entomology:** To attend the 3rd International Summerschool on EPG and Stylectomy techniques at the INRA-INSA laboratories, France. The course deals with the techniques of Electrical Penetration Graphs for studying the feeding behaviour of sap-sucking insects, and stylectomy, a technique used to collect phloem by use of sap-feeding insects.

CSIRO Chief Executive's Study Awards are sponsored by Ansett Australia, which provides free air travel to the winners.

# Forum offers contact for staff of all levels

BY WENDY PARSONS

**"Next to face-to-face communication, the overwhelming preference around the organisation was for e-mail," reported Steve Bright last year.**

Even as he spoke, the volume of messages on internal mail was rising dramatically. "csiro-forum" was established in June 1995, just as the Bright Report was being released. I suspect "forum" was spawned when the feisty Carmel Macpherson, then General Manager, Human Resources Branch, discovered that in our supposedly high-tech organisation there was no way of reaching all staff by email. "csiro-all" was set up, followed a few hours later on the same day by csiro-forum.

There was an apocryphal story around at the time that the many people trying to respond to the first csiro-all messages forced the system to crash and so an interactive email group had to be set up immediately to cope with the rising tide of eager email debaters.

The difference between the two was that Forum would operate as a discussion point for registered users — people who wanted to take part — and csiro-all as a message-carrying channel available only to the Chief Executive and

Deputy Chief Executives.

While our preference for email was overwhelming, the volume of Forum messages during 1995 eventually overwhelmed many of the original participants and they de-registered, complaining that it had all become too much. Others registered to take their places and the number of participants still remains steady at around 740 (10% of staff).

"A constraint on the development of an effective email system appears to be the reluctance of people above the level of Program Manager to make use of the system," Steve Bright said in 1995. "It was widely perceived amongst interviewees that senior management didn't use, and didn't support, email." He recommended a development program specifically to help managers get the best results out of the system.

Since then, we have seen Forum used by both Roy Green and Malcolm McIntosh to comment on particular issues. Until March, the Executive Committee received and responded to a monthly summary of Forum discussions.

The jury is still out on whether there is a need to continue these summaries. In a recent communique, Malcolm McIntosh has encouraged the use of forum, saying: "I have

been taking part in csiro-forum from time to time. I see it as a useful device for some kinds of discussion, not all of which necessarily involve senior management; I do not guarantee to respond to all items."

A valuable spin-off from Forum is the wide contact now available to staff at all levels and in many disciplines. As one forum-ite said: "This is the best opportunity many of those in lower classifications (the less pushy people) have for airing their views."

All forum messages have an equal opportunity to be read by decision-makers and other staff for consideration or comment, regardless of whether the originators were CSOF1 or CSOF9. Forum also provides the quickest means of bouncing ideas off lots of people with different specialisations and different perspectives on a problem."

You can subscribe to csiro-forum by sending a message to csiro-forum-request, and placing the word "subscribe" in the body of the message. To give you an idea of recent issues under discussion, the csiro-forum "Final Forum Summary for March" can be found on the Web under <http://www.csiro.au:80/mailarchives/csiro-forum/archive/01Apr96-30Apr96/0063.html>.



Dr McIntosh presents the Arthur Frost award to Warren Preston

## Apprentice award

**Warren Preston of CSIRO's Division of Radiophysics in Sydney has won the CSIRO Arthur Frost Apprentice Award for 1995-96. It was presented to him by Chief Executive Dr Malcolm McIntosh in Canberra in May.**

Warren, 21, was closely involved in the design of the radiotelescope receiver for use in the Galileo Project and the SETI Project. "If there's life out there, I'd like to think that I helped make contact," he says.

"It's an honour getting the award for doing something that I love to do."

He gained distinctions in both the Drafting Certificate and Associate Diploma in Mechanical Engineering. Warren has also received the Granville Rotary Club's Outstanding Achievement Award and won the silver medal in the Works Skill Australia Foundation's engineering drawing competition.

The CSIRO Arthur Frost Award has been presented annually since 1974.

## Home on the rangelands

**Dr Margaret Friedel received the Outstanding Achievement Award at the Society for Range Management's Meeting in Wichita, Kansas, on February 14.**

The society has members in 48 countries and is the world's leading authority on rangelands and their renewable natural resources.

Dr Friedel, head of the Division of Wildlife and Ecology's Alice Springs lab, is one of the world's leading range scientists.

Her work in central Australia has had far-reaching implications in Europe, South Africa and the United States.

In particular her concept of "thresholds" of environmental change, backed by solid field data, has led to increasing recognition among researchers and ecologists of the often irreversible nature of broadscale changes in rangelands. Her work influenced US government agencies in the development of new approaches to assessing rangeland condition, or "health".

In Australia, she has provided



Dr Margaret H. Friedel

better methods for ground-based monitoring of rangeland condition. The procedures developed by Dr Friedel and her colleagues have been widely adopted for research on ecology and management of arid zones and the sampling methods are now in demand by managers and scientists throughout the world.

Her leadership and active roles in past International Rangeland Congresses have contributed significantly to the success of these congresses.

Julie Crough

## A shared birthday

**CSIRO's 70th anniversary coincided with Dr Robin Wooding's 70th birthday in April.**

Dr Wooding, a Fellow with the Centre for Environmental Mechanics in Canberra, has spent his career applying a knowledge of groundwater flow to environmental problems. Before joining CSIRO, he worked for New Zealand's DSIR to establish a power station based on the flow of hot volcanic water. DSIR would have shared the accolade of becoming a septuagenarian this year, had it not been partitioned by the government in the early 1990s.



Robin Wooding measures soil properties with a disc permeameter

Today, Dr Wooding is preoccupied with the problems of salt in agricultural land. "In much of the Murray-Darling Basin, the shallow fresh water upon which our agriculture

depends is actually floating on top of brine," he says. "In lower-lying areas the surface of that brine layer reaches the ground surface, forming natural salt lakes and killing the vegetation."

If irrigated areas are not well drained of irrigation wastewater, the upward movement of the water table is accelerated. Concentrated wastewater cannot be disposed of through pipes due to its high corrosive properties, nor be sent to evaporation ponds due to the possibility of leakage into the local groundwater.

Dr Wooding believes natural salt lakes are suitable areas to dispose of wastewater. "Groundwater tends to flow towards salt lakes from all sides, thus salt stays in a lake of that kind," he says.

Simon Torok

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# CoResearch

No. 367

August 1996

CSIRO's staff newspaper

CSIRO  
AUSTRALIA

Looking back — CSIRO through the years: Pages 3-6

## Restructuring — the process marches on

By HERMINA MARTZ AND  
JENIFER NORTH

The second stage of CSIRO's 1996 restructure, announced early last month, will see a reduction in the number of Divisions by this time next year.

The Chief Executive, Dr Malcolm McIntosh, outlined the proposed changes in a message to all staff on 8 July. Dr McIntosh described the Divisional mergers as a strategic reshaping of CSIRO.

"The amalgamation of a number of scientific Divisions into larger units will position CSIRO to tackle key issues facing Australia as it enters the 21st century," he said. "The mergers mean stronger support from CSIRO for its government and private customers, as well as a climate in which scientific excellence, leadership and collaborations can flourish."

Under the plan, unifying the Divisions of Fisheries and Oceanography, and developing closer links with the Australian Institute of Marine Science, would enable CSIRO to help the maritime industries realise their goal of sustainable production worth \$50-80 billion from Australia's Exclusive Economic Zone by 2020.

CSIRO will be able to deliver leading-edge technology to some of the nation's fastest-growing export industries through forging closer links between:

- the Divisions of Minerals, Materials Science and Technology, and Manufacturing Technology;
- the Division of Petroleum Resources, and Exploration and Mining; and
- the Divisions of Mathematics and Statistics, and Information Technology.

Scientists from CSIRO's Divisions of Soils and Water Resources will combine their skills with colleagues from the Centre for Environmental Mechanics to provide a

vigorous, integrated approach to Australia's acute problems of land degradation and water quality.

Other Divisions have been asked to explore various merger scenarios and to prepare proposals for Dr McIntosh's consideration.

They include the Divisions of Food Science and Technology, and Human Nutrition; Horticulture and Plant Industry; Tropical Animal Production and Tropical Crops and Pastures; and Applied Physics and Radiophysics.

Many mergers will involve rationalisation of sites, and some were deemed necessary to increase operating units to a more viable size.

There are 11 Divisions unaffected by these merger proposals, although the Division of Animal Production is now undergoing a massive restructure for financial reasons (see "Animal Production cut severely", page 2). The Divisions affected have a year to develop their new structures, which should start operating on 1 July 1997.

Dr McIntosh believes the mergers will be financially neutral in the first instance, but he hopes they will eventually deliver savings in administration, releasing more money for science.

### Sector plans progress

Earlier this year new management arrangements for CSIRO removed the Institute structure and created a flexible arrangement in which Divisions are individually accountable to one of four Deputy Chief Executives, but collaborate with each other in support of work for the 22 Sectors of the national economy and its natural resources.

Sectors are grouped informally into five Alliances to help define the needs of customers, and enhance development and maintenance of CSIRO's scientific skill-base.

CSIRO Chiefs, representatives of Sector Advisory Committees and planners gathered in Canberra on 6 and 7 August to discuss plans in our first "Outlook Forum".

The Forum aims to convey to the CSIRO Executive the combined views of CSIRO participants and their Advisory Committees on R&D for the Sectors, in terms of opportunities and potential returns to Australia from work in each Sector. This will be the

major input into the Executive's discussion of a profile of effort across Sectors for the next triennium.

The closer involvement of representatives involved in Sector industries in our planning may help to overcome a frequent problem CSIRO has in meeting the needs of its customers. This is that our customers cannot always identify their needs clearly — or they think in such short terms that R&D

would have no useful effect.

Corporate Planner Dr Andrew Pik said the Forum had been characterised by a very positive spirit. "The presentations were excellent and informative and represented a massive effort by all concerned."

However, Dr Pik added, "In terms of helping the Executive to set priorities, we may have to rethink the scope and content of the presentations and discussions when we hold the Forum again in three years."

### CSIRO scientists front up



Professor Sir Gustav Nossal, former CSIRO Board member



Biochemist James Davenport (born 1925), acrylic on canvas by Alan Oldfield (born 1943).

CSIRO scientists feature prominently in the current exhibition, *The Clever Country: Scientists in Australia*, at the National Portrait Gallery, Old Parliament House, Canberra.

The exhibition was opened by the Minister for Communications and Arts, Senator Richard Alston, on 20 June and will end on 3 November.

Among the many fine portraits celebrating the contribution of CSIRO scientists are

those of engineer, inventor of the totaliser and CSIR Chairman Sir George Julius; agricultural scientist and former CSIRO Chairman Sir Ian Clunies Ross; geneticist Dr Helen Newton Turner; biochemist James Davenport; radio astronomer and former Chairman Dr Paul Wild; and current Chairman Professor Adrienne Clarke.

The exhibition spans two centuries and includes a variety of media and some intriguing scientific artefacts.

# Short shots

## Portrait of John Stocker unveiled

In keeping with the CSIRO tradition of commissioning portraits of past Chief Executives, a portrait of Dr John Stocker was unveiled at a presentation held in May at Clayton.

Those present at the ceremony included Dr Stocker, his wife, two daughters and parents. CSIRO Board member Doug Shears also attended, along with several Divisional Chiefs, Deputy Chiefs and others who worked closely with Dr Stocker at CSIRO.

Speakers at the presentation included the Chief of the Division of Minerals, Dr LaNauze, who hosted the event and welcomed guests and staff.

The Deputy Chief Executive, Dr Colin Adam, spoke of Dr Stocker's many accomplishments within CSIRO and mentioned that a number of old-time CSIRO scientists had likened "John's zest for promoting CSIRO to that of one of our previous Chief Executives, Sir Ian Clunies Ross".

The portrait will reside at Head Office in Canberra, where it will hang alongside a collection of portraits of other past CSIRO Chief Executives.

## Award for Flushing Meadows

The CSIRO Wagga Wagga Effluent Plantation Project was awarded the 1996 Banksia Environmental Award for Land Management as part of Environment Week.

The Banksia Awards are Australia's most prestigious awards for environmental excellence.

At the Wagga Wagga site, affectionately known as "Flushing Meadows", treated sewage effluent has been applied to about 8000 trees for five years, and growth



Dr Stocker at the portrait unveiling with Doug Shears (left) and Dr Colin Adam

of the trees has been excellent. They have grown up to 23 metres high and 30cm in diameter.

The Flushing Meadows experiment involved work by scientists from both the Divisions of Forestry and Forest Products and Soils, and is sponsored by the Land and Water Research R&D Corporation, Murray Darling Basin Commission, NSW Department of Land and Water Conservation, Wagga Wagga City Council and Tahara Pastoral Pty Ltd.

## International Statistical Congress

CSIRO was a major sponsor and organiser of the Sydney International Statistical Congress (SISC-96) held early last month.

The conference attracted the cream of statistical expertise from around the world and, with more than 800 delegates, was the largest ever held in Australia.

Dr Nick Fisher, Head of Applied and Industrial Statistics at CSIRO and director of the congress, said: "It wasn't just numbers, graphs and equations that were the topics of our sessions, but practical ways of helping business and the community."

Delegates discussed ways of obtaining new insights from HIV/AIDS data, measuring business

performance, monitoring water pollution and using "data-mining" to extract nuggets of information from "data mountains".

## CSIRO joins Food CRC

CSIRO's Division of Food Science and Technology is a major participant in the newly launched CRC for International Food Manufacture & Packaging Science.

CSIRO's contribution to the CRC will be in three main areas.

- Developing novel "hurdle" technologies to prevent bacterial growth in the lightly processed foods demanded by today's consumer.
- Developing sophisticated sensors to measure odours and flavours in a factory environment. This also includes investigating biases in sensory measurement as well as developing guidelines and criteria for effective taste panel training.
- Developing quality-assurance systems for minimally processed horticultural products.

## Goodbye to the Institutes

Office staff from the Institute of Natural Resources and Environment got together on 30 June to say farewell to INRE. All agreed it had been a great eight years.

Left to right, they are: Greg Thill, Jan George, Geoff McAlpine, Graeme Pearman, Chris Smith, Trish Blakey and Wendy Parsons.



# Animal Production cut severely

BY HERMINA MARTZ

## The Division of Animal Production suffered a major blow when CSIRO's Chief Executive, Dr Malcolm McIntosh, announced recently that 100 staff must go.

The announcement — which was not unexpected, with many people both within and outside CSIRO aware of the Division's large deficit — was made on 1 July 1996 and caused a great outcry in rural New South Wales.

The Division's three major sites, Prospect (Sydney), Chiswick (Armidale, New South Wales) and Floreat Park (Perth) are all affected, with Chiswick just barely surviving. The number of redundancies is largest at Prospect, but the proportionate reduction at Chiswick will be greater.

Floreat Park lost five positions, while Prospect, which had been expecting worse, is to shed 50 people. Chiswick will lose 45 positions.

The drastic restructuring of the Division may also involve the sale of two field stations at Arding and Longford, near Armidale. Surplus land at Prospect will be sold, and the field station at Badgerys Creek is already on the market.

Dr McIntosh said the cuts were necessary because of a "very substantial downturn in funds for research from wool growers, from over \$6 million per annum six years ago to some \$1.6 million per annum.

"The Division now has far more laboratory infrastructure and staff than it can support from its income."

As well as wholesale staff losses and property sales, two Armidale projects will be relocated to Prospect and Floreat Park (Parasitology and Controlled Release of Veterinary Pharmaceuticals, respectively), and work will stop on Sustainability of Grazing Systems at Armidale.

## Changes

The monumental changes to the Division follow "a financial assessment that pointed overwhelmingly to closing Chiswick," said CSIRO's Chief Executive.

Those who attended a Chiswick meeting of staff and New England wool growers at the end of June heard the Deputy Chief Executive Agribusiness, Dr Chris Mallett, and the Division's Chief, Dr Oliver Mayo, state that their recommendation was for Longford to be retained and Chiswick to be closed to

"move the Division into the black by the middle of next year".

However, a compromise was announced in the 1 July 1996 press release, with Chiswick receiving a one-year reprieve. The scaled-down pastoral-research station has 12 months to prove itself viable.

"The decision to retain Chiswick recognised local concerns in a region where we have been made welcome and supported, the concerns of customers, and the availability of a modern laboratory building to house staff to be retained in the Armidale region," said Dr McIntosh.

"It is only affordable if we get an adequate Budget from the Commonwealth and will be reviewed after one year for signs of a recovery in grower research funds or other external income. On the one hand, or a suitable tenant to share the laboratory costs on the other."

An editorial in *The Land* reported the president of the Wool Council of Australia, Rod Thirkell-Johnston, as calling for a system of counter-cyclical funding to avoid any further cutbacks to CSIRO's rural research

Last month *The Australian* newspaper reported that many wool growers were switching

from wool to wheat in pursuit of better returns. Statistics from the Australian Bureau of Agricultural and Resource Economics (ABARE) explain the recent trend in clear terms.

In 1992-93, the pool return (the average price the Australian Wheat Board paid for wheat) was \$160 a ton. Wheat prices continued to increase, rising to \$255 a ton last financial year. In contrast, the article said wool prices had been falling, dragged down by lack of overseas demand and the effect of drought in the early 1990s.

## Future

So what does the future hold for our wool and wheat producers? According to ABARE, wheat prices will fall due to global oversupply while next year's wool price will rise. Such a scenario of rising and falling prices of wool and wheat (and other crops) and rising and falling volumes of production inevitably leads to substantial variation in producer income and subsequent funds levied for research.

ABARE's forecasts give credence to Mr Thirkell-Johnston's call for another system of research funding, to avoid the inevitable changes in rural sector income due to

market forces, and its strong impact on CSIRO's rural research.

Many of those affected by the decision to drastically cut staff numbers at Chiswick, as well as the general population of the Armidale area (where Chiswick is sited), have expressed outrage at the decision.

More than 400 people attended a crisis meeting at the Armidale Town Hall on 8 July to try to save Chiswick. They were concerned that CSIRO was simply focusing on the bottom-line dollar result and avoiding looking at the social realities of such a decision.

A recent editorial in the *Armidale Express* said the local community expected Governments to make decisions with regard to their "social responsibility" to regional Australia.

The Chief of the Division, Dr Oliver Mayo, told *CoResearch*: "I will be working for the retention of Chiswick, but the near closure of Chiswick is preferable to closing Prospect".

Dr Mayo said he was exploring various options in a bid to attract tenants for the research station, and the Division was also looking at directing its rural research into new directions.

# CSIRO through the ages

AN HISTORICAL FEATURE COMPILED BY JANE KAHLER AND WENDY PARSONS

## A celebrated septuagenarian

Even in the midst of enormous change, CSIRO is still able to celebrate its 70th anniversary. The current restructuring builds on a 70-year history of scientific achievement in an organisation that has weathered more controversy and upheaval than it cares to think about.

Science has not had an easy time in Australia. Up until the late 19th century, Australia's few scientists were engaged in the description and classification of Australia's flora and fauna, and some physical sciences such as geological mapping and meteorology.

Science and scientists were generally not perceived as being able to contribute to the economic development of the nation, and so their needs, activities and expertise remained largely ignored.

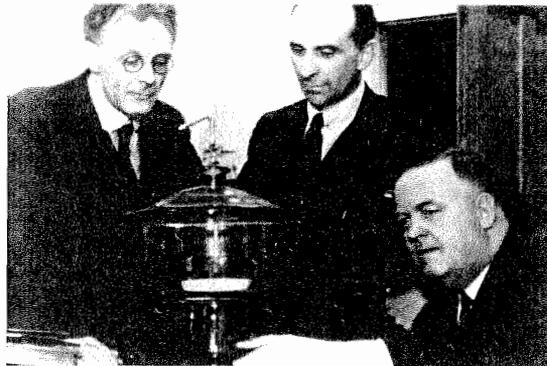
In a country that appeared to have abundant fertile lands, Australia was riding high on its

prosperous agricultural industry. It was not until reduced yields, plant and livestock diseases and pest species threatened the industry that State and Federal Governments moved to apply science to regain its prosperity.

Departments of Agriculture were set up in all States, but were unable to provide the level of support that their scientific staff and projects required.

This presented an opening for the formation of a national scientific body. World War I and news of a British programme to promote scientific and industrial research also helped, prompting then Prime Minister William Hughes to set up, in 1916, the Institute of Science and Industry at 314 Albert Street, East Melbourne.

By 1919 the Institute seemed to be a lost cause, but gained a reprieve in 1920 when the Government passed an Act establishing it as a permanent institution. The fledgling organisation struggled on with limited funds, managing to



Steering the organisation through its formative years was its first Executive Committee, consisting of Sir George Julius, Sir David Rivett and Professor Arnold Richardson.

provide solutions to problems as great as the "bunchy-top" virus that threatened the nation's banana industry.

In 1926, the Government passed the long-awaited Science and Industry Research Act and the Institute reorganised to become the Council for Scientific and Industrial Research (CSIR). Headed by Sir

George Julius, Sir David Rivett and Professor Arnold Richardson, its role was to undertake research for the benefit of Australia's primary and secondary industries, but in its early days it focused on agricultural and forest products.

Over time, the CSIR expanded its research efforts, becoming one of the most

comprehensive scientific organisations in the world. Through the quality of its research and its many research successes, it commanded respect from the world's scientific community as well as the Australian public.

The Executive Committee of Julius, Rivett and Richardson, combined with the organisation's ability to identify and respond to the nation's needs, steered it through difficult times such as the Great Depression in the 1930s and World War II.

But World War II left a much-changed world, both technologically and economically. One effect of this change was the passing of a second Science and Industry Research Act in 1949, in response to controversy over scientific freedom and national security. CSIR underwent a further reorganisation to become CSIRO, the Commonwealth Scientific and Industrial Research Organisation.

## Science puts Australia on the map

Throughout its history, CSIRO's scientists have performed world-class research benefiting Australia and the rest of the world. Spanning agriculture, manufacturing, mining, the environment and information technology, CSIRO research has contributed to the health, wealth and quality of life of Australia and other nations. In this article, we look at some of the achievements that have helped put Australia on the map.

Identifying the cause of a problem and then its solution can sometimes require information at an atomic level. Enter Alan Walsh, a CSIRO physicist who, in 1952, developed the technique of atomic absorption spectroscopy.

Hailed as the most significant advance in chemical analysis this century, atomic absorption spectroscopy is routinely used in medicine, manufacturing, mining and laboratories around the world. Saving lives and helping industry to become more efficient, the technique has earned Australia

millions in export dollars.

But research at CSIRO not only produces marketable commodities. Australia's primary industry has relied on CSIRO scientists to provide solutions to problems threatening its survival.

After years of research, scientists Francis Ratcliffe and Lionel Bull were instrumental in the 1950 release of the myxoma virus to control the rabbit population that was ravaging the country, destroying valuable pasture, denuding the land and endangering native species.

Within three years, Australia's wool and meat production jumped by \$68 million, as the land and pastures recovered. More than 40 years later, the release of the myxoma virus has provided incalculable benefit to Australia despite the development of some resistance to it.

CSIRO scientists continue to work on many aspects of rabbit

population control, with the calcivirus and possible immunological mechanisms as two examples.

More recently, CSIRO scientists have enjoyed the honour of winning three of the five Australia Prizes ever awarded.

The Australia Prize is an international award made each year by the Australian Government for outstanding contributions to science and technology promoting human welfare. It was first awarded in 1992 to CSIRO scientists John Watt, Brian Sowerby and Nicholas Cutmore from the Division of Mineral and Process Engineering, and Jim Howarth of the Adelaide company Mineral Control Instrumentation Ltd.

Their work led to the development of Coalscan, a technology for on-line analysis of mineral, moisture and ash content of coal, which continues to produce significant financial benefits for Australia.

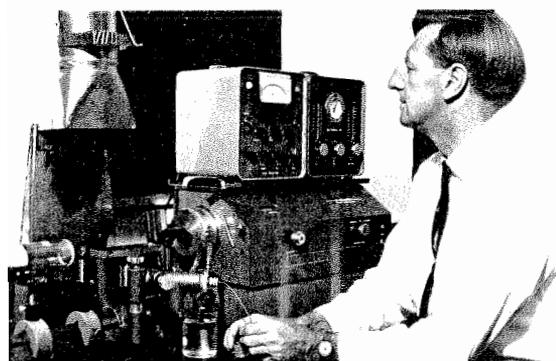
CSIRO scientists again scooped the pool in 1995 when Ken McCracken, Andrew Green and Jonathon Huntington shared the Australia Prize with Richard Moore from the University of Kansas for pioneering satellite-

based remote sensing in Australia.

Used by the mineral exploration industry, the technology places Australian exploration companies among the most sophisticated users of remote sensing techniques and data in the world. It can also be used to monitor crops, overgrazing, erosion, flooding and fire damage, and to map ecosystems.

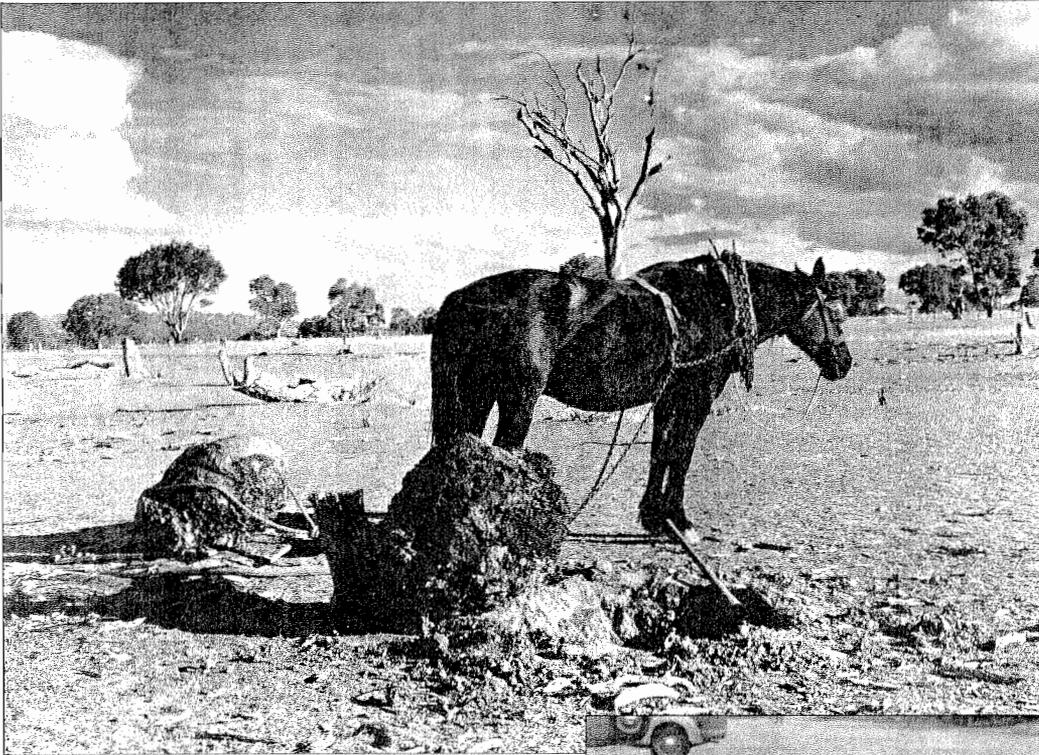
In 1996, Peter Colman from the Division of Biomolecular Engineering shared the Australia Prize for his work towards a drug to combat influenza with Graeme Laver from the Australian National University, Professor von Izstein from the Victorian College of Pharmacy and Paul Janssen, Chairman of the Janssen Research Foundation Worldwide.

Seventy years on, there are many research projects at CSIRO that have, and will continue to, promote Australia and Australian science to the rest of the world. The Organisation's achievements are a source of national pride, and its commitment to scientific excellence will see that its reputation as a world-class organisation remains.



Dr Alan Walsh developed the technique of atomic absorption spectroscopy in 1952. His work has saved lives, made industry more efficient, and earned Australia millions in export dollars.

# CSIRO through the ages



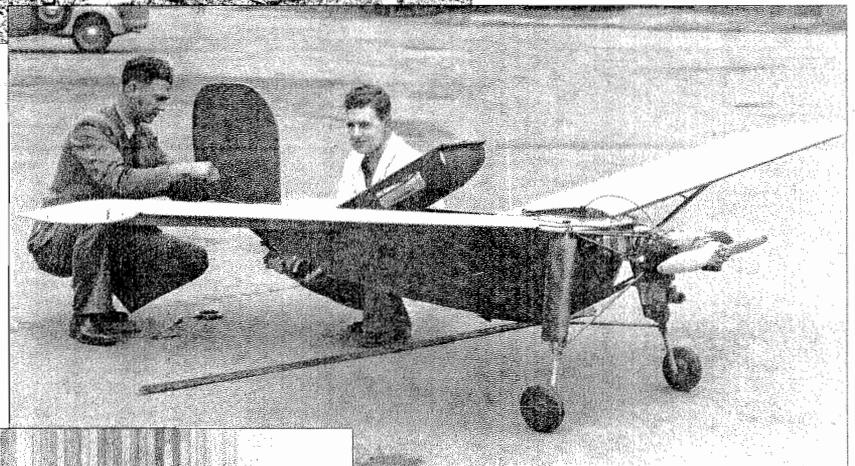
## Budget cuts force CSIRO off the road

Early form of official vehicle. Horse and owner were engaged by the Division of Entomology (then called Economic Entomology). Here, the horse is being used to drag pieces of mound of the termite *Nasutitermes exitiosus*, back to the laboratory for study. Photograph taken by GF Hill, 1930. Location, North Canberra. In the background, Red Hill.

## Rainmakers play while sun shines

The Division of Cloud Physics conducted cloud seeding experiments with the aim of staving off the ravages of drought. The rainmakers had their first success on 5 February 1947, when rain started to fall minutes after dry ice had been dumped into deep cumulus cloud. The rain lasted several hours, with more than 12 millimetres falling over an area of 80 square kilometres.

It is believed to be the first documented case anywhere in the world of an appreciable man-made rainfall reaching the ground. Cloud seeding experiments continued well into the 1970s. The plane pictured above is a model of the real thing!



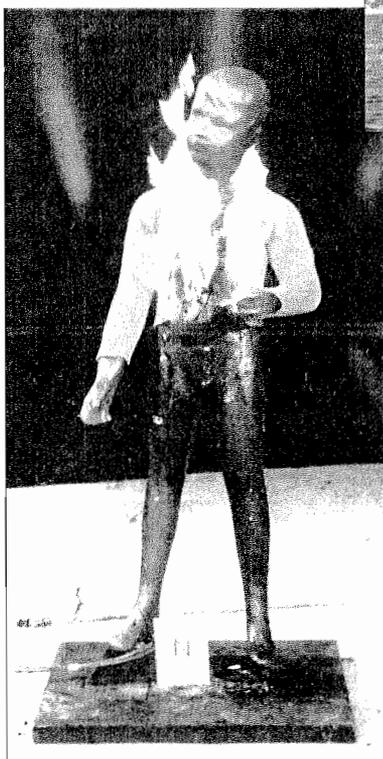
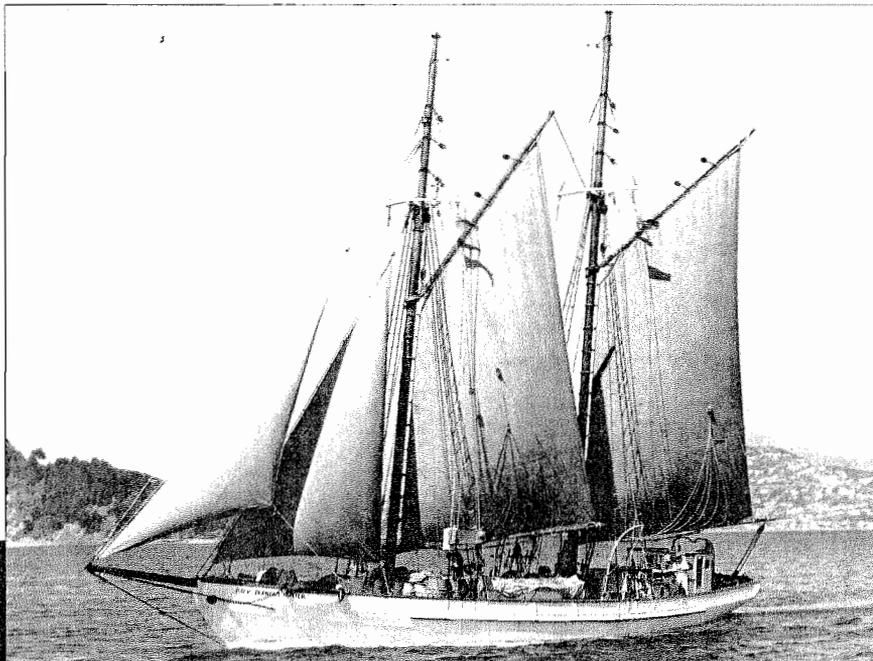
## “Get out of my laboratory!”, CSIRO scientist tells communicator

Laboratory occupied by Dr J Legg and Mr RB Kelley in 1932 at the Animal Health Research Station, Oonoonba, Townsville, Queensland. Communicators weren't actually a part of the Organisation back then, but if they were, the scientists pictured above would have most definitely welcomed them into their laboratory!

# CSIRO through the ages

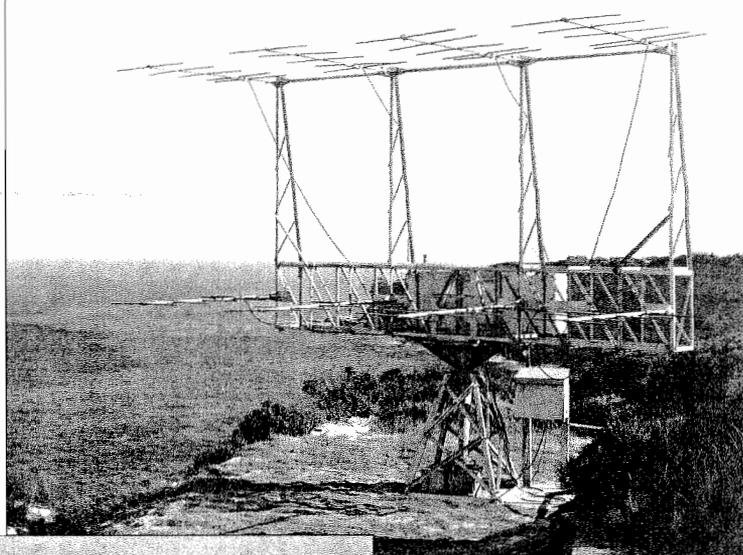
## Chief executive says wind power saves money

Built in Tasmania in 1946, the FRV Derwent Hunter was purchased by CSIRO in 1950 for £12,000. Rigged as a schooner in 1952, it measured 72ft, and had a 72 HP diesel engine and distinctive red sails. The vessel was used in a range of projects including shark tagging and droplining for deep sea trevally from 1950 to 1955. Between 1956 and 1959, the Derwent Hunter was engaged in oceanographic studies in the Coral Sea, but also hydrography and plankton studies in the Tasman Sea. Before being sold in 1962 for £6,060, it was used for tuna longlining off NSW, Victoria and Tasmania. Photograph taken in 1957.



## Child named in bizarre CSIRO experiment

FRED, the Fire Resistant Experimental Dummy, was used in a series of clothing flammability experiments by scientist Tom Pressley from the Division of Protein Chemistry. Pressley's work led to the rewriting of Australian safety standards, and the development of non-burning wool fabric. Photograph taken circa 1971.



## New Hills Hoist technology tested on coast

Sea interferometry experiments conducted by the Division of Radiophysics, at its Dover Heights field station in Sydney's eastern suburbs, were based on the observation that as the sun rose over the horizon, radio emissions received directly from the sun interfered with those reflected from the sea. Analysis of the beating radio noise, recorded on a chart, showed that the source of the emissions corresponded with a sunspot group. This was the first time interferometry was used in radio astronomy. Sea interferometry was also used to establish that radio noise from the Cygnus region of the Milky Way was actually radiation from galaxies well beyond it. Photograph taken in 1951.

## CSIRO tests latest smoke signal technology

A light aircraft "seeds" high-risk bushland with incendiary devices to set off a pattern of small, low-intensity fires that will clear forest litter before burning themselves out. Photograph taken 1975.



# CoResearch through the ages

Number 00 December 1958

## EXECUTIVE MEETS WOOL PRODUCERS

Meetings between the Executive and representatives of the pastoral industry were revived last month. A conference was held at Head Office on 11th November to inform graziers' representatives of recent wool research results and to discuss urgent problems of the industry...

These meetings are important in keeping the enthusiastic interest in research of influential members of the pastoral industry.

They are of special significance now since C.S.I.R.O. will need more funds from industry for its wool research programme in 1960 when the current five year programme ends...

## NEW AUSTRALIANS IN C.S.I.R.O.

Many scientists from Europe have come to Australia to work with C.S.I.R.O. in the post-war years, and a large number of immigrants to Australia have joined C.S.I.R.O. in non-scientific capacities.

A recent survey by Staff Section shows that we have among us 150 people of non-British nationality. They come from 28 different countries, and include laboratory assistants, labourers, station hands, a cook, tradesmen of all kinds, librarians, translators and, of course, scientists.

Among the countries listed as birth places by our new Australian members are Austria, Bulgaria, China, Croatia, Czechoslovakia, Egypt, Estonia, France, Germany, Greece, Holland, Hungary, India, Indonesia, Lithuania, Manchuria, Norway, Poland, Rumania, Russia, Spain, Sweden, Switzerland, Ukraine, the U.S.A. and Yugoslavia...

Number 1 April 1959

## LINES OF COMMUNICATION

Our 4000 staff members are scattered over Australia, from Sydney to Perth, from Hobart to Thursday Island. Lines of communication between them are tenuous.

Study of our press releases and the reports which circulate in C.S.I.R.O. can provide some information on what is going on, but many C.S.I.R.O. happenings never become known to the staff.

The aim of CORESEARCH is to let all members of staff know what is going on in C.S.I.R.O. The news in this first issue has been gleaned from the 20,000 letters which have passed in and out of Head Office during the past month...

Number 3 June 1959

## WE ARE CLOSE TO MONASH

Thirty-five acres on the north-west corner of the site of Melbourne's new Monash University are reserved for C.S.I.R.O., Mr R.R. Blackwood, Chairman of the University's Interim Council, announced last month...

Our land will be an independent site with its own entrance from Normanby Road...

The Division of Chemical Physics will be the first C.S.I.R.O. group on the site... this will help relieve congestion at the Chemical Research Laboratories at Fishermen's Bend.

## WASH-AND-WEAR WOOL

C.S.I.R.O. has recently completed practical tests on all-wool shirts treated by a wash-and-wear process developed by the Wool

Research Laboratories, Mr Casey told the House recently.

He was replying to a Parliamentary question asked by Mr L.W. Hamilton, Member for Canning.

The results of these tests indicate that the process is a very satisfactory one, and is suitable for commercial development, Mr Casey said...

Number 4 July 1959

## SIR IAN WIDELY MOURNED

Sir Ian Clunies Ross, C.M.G., D.V.Sc., D.Sc., ARC.VS., LL.D., F.A.A., Chairman of C.S.I.R.O., died shortly after 9 p.m. on 20th June in the Mercy Hospital, Melbourne...

Sir Ian was one of Australia's very great men and he is mourned by people in all walks of life...

He had a great charm of manner and a genuine humility which won him a wealth of friends.

Number 5 August 1959

## RADIO TELESCOPE CONTRACT LET

The contract for the giant radio telescope for the Division of Radiophysics has been placed with a German firm.

The German company, Maschinenfabrik Augsburg-Nuernberg (or M.A.N for short), has already carried out many large contracts in Australia, including bridge work, hydraulic gear for dams, and heavy machinery...

The radio telescope is to be erected at Parkes, N.S.W., about 200 miles west of Sydney.

Number 11 February 1960

## MARGINAL INCREASES

On 31st December the Executive announced its decision that marginal increases be applied to the salaries of all adult officers and employees of the Organization retrospectively to 3rd December, 1959.

The increases range from £15 p.a. to £775 p.a. Some representative examples of the increases are:

Fitter and Turner — Salary maximum increased by	£68 p.a.
Technical Assistant Grade 1	£73 p.a.
Experimental Officer Grade 1	£165 p.a.
Research Officer	£275 p.a.
Technical Officer Grade II	£165 p.a.
Senior Research Officer	£345 p.a.
Experimental Officer Grade III	£285 p.a.
Senior Technical Officer Grade III	£205 p.a.
Typist	£54 p.a.
Storeman	£54 p.a.
Senior Laboratory Craftsman	
Grade II	£125 p.a.

Number 12 March 1960

## SIRONIZED WOOL GOES TO WIMBLEDON

Australia's new wash and wear woollen fabric will make its debut at Wimbledon this year.

Australian women tennis players have included no-iron, light-weight, wool tennis dresses in their travel wardrobes.

Number 16 July 1960

## FRESH WATER FROM THE SEA

An atomic power station operating a machine to extract the salt from sea water

could provide water for developing millions of acres of semi-desert in Australia within the next twenty years. This project is regarded now as a feasible possibility.

A few years ago it would have been thought of as flighty and imaginary, but modern research and economic studies have brought it to the stage where it can be realized in practice with no more than the application of known techniques...

The Officer-in-Charge of the Chemical Engineering Section (Dr H.R.C. Pratt) recently told the Society of Chemical Industry of Victoria that South Australia will utilize all available water supplies in the next ten to fifteen years so that an atomic treatment plant for sea water will be an essential for further development.

Number 30 November 1961

## TOTAL CSIRO VOTE UP BY 1,000,000 POUNDS

C.S.I.R.O. will have a total Budget for 1961/62 of £12,593,000 for capital and non-capital items.

A total of £9,628,000 will come direct from Treasury, of which £8,600,000 is for non-capital expenditure.

Unavoidable salary increases (increments and basic wage adjustment) will absorb £309,700, leaving £554,300 available for other purposes. The Executive proposes to use this in the following way:

- (1) To raise maintenance provisions to adequate levels.
- (2) To increase the temporary assistance votes in cases where insufficient funds have been available for casual labour.
- (3) To allocate funds to some Divisions for major items of equipment.
- (4) To provide new positions for some ancillary staff.

Money from wool funds has increased and has permitted expansion in some fields.

Number 144 March 1971

## DIVISIONS REORGANIZED

The Executive has re-organized those Divisions concerned with research for the mineral and food industries.

Mr I.E. Newnham, formerly Chief of the Division of Mineral Chemistry, has been appointed Director of the CSIRO Minerals Research Laboratories, a complex comprising the Divisions of Mineral Chemistry, Chemical Engineering and Mineralogy.

Mr Newnham will be located at 314 Albert Street, East Melbourne, for the time being.

Dr D.F. Koch will be Acting Chief of the Division of Mineral Chemistry pending the appointment of a new Chief.

Mr A.J. Gaskin is Chief of the new Division of Mineralogy, which will have its headquarters at Floreat Park, Perth, where a new laboratory is now under construction...

The reorganization is designed to co-ordinate the Organization's growing minerals research programmes more effectively, to promote inter-Divisional collaboration and to improve communications with the industry.

## CSIRO'S BUDGET CUT

Towards the end of last month, the Federal Cabinet reviewed the state of the National Economy and, subsequently, the Prime Minister instructed all Ministers to cut back expenditure in those Departments and Instrumentalities under their control.

As a result of discussions between the Minister for Science, Mr Nigel Bowen, and

the Chairman, the following telegram was sent by the Chairman to all Chiefs and Officers-in-Charge.

"Following Cabinet consideration of the state of the economy and the Prime Minister's recent announcement, the Minister has instructed me to introduce immediate economies in CSIRO. Each Chief will be advised separately about specific economies relating to his Division.

"In the meantime the following stringencies will apply throughout CSIRO immediately.

"No action should be taken to fill existing or new vacant positions irrespective of the source of the financial support unless a commitment has already been entered into with an individual. For the remainder of the year, all positions will revert to a positional pool and requests relating to urgent staffing needs only should be referred to Head Office for consideration by the Executive."

Number 161 August 1972

## PIPED LIGHT — Tribophysics Development

The 'wired city' as part of the 'global village' has been brought one step closer with the development of a new method of carrying communications signals, developed by the Division of Tribophysics.

After two years of work, Dr Graeme Ogilvie and Mr Rod Esdaile of the Division have produced an optical fibre system that consists of a very fine fused quartz tube that contains tetrachlorethylene.

This chemical is well known as a dry cleaning agent, although for this use it is in a highly purified form...

Number 162 September 1972

## UK MINISTER

The Right Honorable Miss Margaret Thatcher recently visited a number of Divisions on a tour of Australia.

Miss Thatcher is the Secretary of State for Education and Science in the UK. At the Division of Computing Research she was met by the Acting Chief, Dr Claringbold, and Mr V.D. Burgmann of the Executive. After the functions of the Division were explained to her, Miss Thatcher was shown around the computing facilities.

Number 168 May 1973

## LAND RESEARCH REORGANISED

A major reorganisation of research for Australia's land resource utilization has taken place. Following a detailed review initiated last year, the Executive decided to establish a group of three research Divisions as the Land Resources Laboratories. The laboratories will co-ordinate and intensify research programmes for the definition, evaluation and efficient management of Australia's land resources.

The new group will comprise the Division of Land Use Research, Division of Land Resources Management and a Division of Soils...

Commenting on the changes, the Minister for Science, Mr W.L. Morrison, said that the reorganization had been brought about by increasing competition for land and growing concern over environmental problems. The Government had expressed its concern for scientific research to be relevant to man's total needs and there was equal concern for the effects of man's activities on his environment.

## Aerospace research deal worth \$20m

A new, five-year \$20 million collaborative research agreement between CSIRO and British Aerospace (BAe) will benefit Australian research and development firms.

The agreement was signed by the Chief Executive, Dr Malcolm McIntosh, and Mr Robin Southwell, Chief Executive of BAe Australian Holdings Ltd, and witnessed by Federal Science and Technology Minister Peter McGauran.

Mr McGauran welcomed BAe's decision to use its Australian operations as the corporate base for expansion into the Asia-Pacific region.

"This is the strongest possible recognition of the world-class capabilities and expertise on offer in Australia, especially within CSIRO," he said.

"The agreement will enable CSIRO and Australian research companies to contribute to what is expected to be a major export-based aerospace industry."

The agreement will focus on specific fields of research, including antenna design, software engineering, advanced composite systems and inspection, ground probing radar, optical systems, vision systems, and metrology.

## Arise, Sir Malcolm (cool in CSIRO wool)

BY NICK GOLDIE

There's been just one suit made in Australia of CSIRO's silky new wool, and it was worn by CSIRO's Chief Executive, Dr Malcolm McIntosh, last month when he was knighted by the Queen.

Dr McIntosh travelled to London in mid-July to be knighted by Queen Elizabeth at Buckingham Palace, and wore the flash suit for the opening by the Queen of a major new British defence establishment.

Fabric for the new suit has been treated to have a soft silky feel, to be more supple than normal, and to have a subtle sheen. It is very light — only 210 grams per square metre — so Dr McIntosh's suit weighs less than one kilogram.

The fabric was developed by the CSIRO Division of Wool Technology's Geelong laboratory, one of the few places in the world where wool can be processed from raw wool straight from the sheep to a finished fabric.

The technology used to make the "silky" wool alters both its feel and optical properties before it is woven into fabric. CSIRO believes it will be the basis of a new international wool-based industry.

Dr McIntosh had his suit tailored in Sydney. The total processing from wool top to finished garment was carried out in less than seven weeks. Woven as a 2/2 twill, it is a dark, charcoal grey suit, with a pin stripe dyed separately in a mushroom beige.

Dr McIntosh received his knighthood for his



Dr Malcolm McIntosh in the suit made of wool treated by the new "silky" process

work as scientific manager and Chief of Britain's Defence Procurement. He has indicated he will not use his new title in Australia.

Dr McIntosh also received a top United States award, the US Department of Defense Medal for Distinguished Public Service, on 1 July this year.

## Breakfast for better urban environments

A recent, successful CSIRO breakfast gave professionals and managers involved in the planning, construction and management of Victoria's urban infrastructure the opportunity to learn of the latest developments affecting their industry.

Held in Melbourne by the CSIRO Division of Building, Construction and Engineering, the breakfast provided information on the future of urban infrastructure.

The Victorian Minister for Planning and Major Projects, Rob Maclellan, spoke of the outlook and requirements of government.

The Chief of the Division, Larry Little, explained the role of CSIRO in innovation and how innovation could advance infrastructure and urban planning and benefit both industry and the community.

Details were given about the developments, opportunities and innovation that could provide a better urban environment for Victoria.

Following the success of industry breakfasts in Brisbane and Melbourne, a similar event is now being planned for Sydney.

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# Movement at the station...

## Lindsay Bevege

CSIRO wishes farewell and good luck to Lindsay Bevege, who left his position as General Manager of Corporate Public Affairs at the end of June.

Lindsay joined CSIRO in 1986 as a Scientific Services Officer for the then Bureau of Information and Public Communication.

He came from the Department of Foreign Affairs, where he had risen from Second Secretary at the Australian Embassy in Manila to Deputy Head of the Indonesia Section in Canberra. By the early nineties he was right-hand man to CSIRO Chief Executive John Stocker.

Lindsay maintained a stream of media stories, public appearances, speeches and events involving the Chief Executive, as well as managing a three-part "empire": Corporate Communication, Education Programs, and the Information Network.

Those who worked with Lindsay

remember him with affection and considerable respect for his journalistic "nose" (for a good story, and a good red wine), his analytical skill, and his persuasive style of management.

He and his wife, Emmy, have started a public affairs consultancy in Melbourne.

## Julian Cribb

Well-known science writer Julian Cribb has joined CSIRO as the Director of a new national awareness team.

Julian has been a journalist, author and newspaper editor since 1969, most recently as science writer for *The Australian*.

As foundation president of Australian Science Communicators, Julian has had a long association with CSIRO, both as an observer of CSIRO science and as a member of a number of CSIRO advisory committees (CASAC, Fisheries and Entomology). He is also on the



Julian Cribb

advisory board of ACIAR, and is a public affairs adviser to CGIAR (the Consultative Group on International Agricultural Research of the World Bank and FAO).

Julian brings great enthusiasm for the communication of science to his new position, and has the keen support of Chief Executive Dr Malcolm McIntosh.

## Chris Moran

Dr Chris Moran was recently appointed Executive Officer, which in practice means giving direct assistance and advice to Chief Executive, Dr Malcolm McIntosh, and providing scientific perspective within an otherwise administrative framework.

Chris was previously a Senior Research Scientist with the Canberra Laboratory of the Division of Soils. In his spare time he restores old furniture.

— Nick Goldie



## Entomology award

A CSIRO Division of Entomology scientist, Dr Ian Common, has won one of the world's premier entomology awards, the Karl Jordan Medal.

Dr Common received the award for nearly five decades of work in the classification and understanding of Australian moths and butterflies.

The medal is conferred by the International Lepidopterists Society for outstanding and original contributions to scientific knowledge.

## Doctorate of Science

Dr John Wilson, Project Leader of the Sugarcane Improvement Group at the Division of Tropical Crops and Pastures,

has been awarded a Doctor of Science degree in Agriculture by Sydney University. Since 1970, Dr Wilson's research has



## Awards

contributed to the success of obtaining high nutritive value in forages, and is now being applied to leading physiology, molecular biology and breeding research on sugarcane.

## Academy Awards

The Australian Academy of Science admitted the following new Fellows at its annual general meeting earlier this year: Professor Adrienne Clarke (Botany, University of Melbourne, and Chairman of CSIRO); Dr Elizabeth Dennis (Plant Genetics, CSIRO Division of Plant Industry); and Mr Barry Jones, MP (a former Science Minister).

## Flinders Medal

The prestigious Flinders Medal was presented to Dr Bill Blevin,

former Chief of the CSIRO Division of Applied Physics, by the Australian Academy of Science at its annual general meeting earlier this year.

Dr Blevin led the National Measurement Laboratory with distinction as Chief Standards Scientist from 1980 to 1994, and headed the Division from 1988 to 1994.

## Queen's Birthday Honours

Dr Bill Denholm (retired research scientist, Division of Minerals) was made a Member in the General Division of the Order of Australia (AM) in the Queen's Birthday 1996 Honours. Dr Denholm was recognised for his research in electrochemistry and pyrometallurgy over many years. (This award was omitted from the Honours list in the previous issue of *CoResearch*.)

## Gaston Planté Medal

Dr David Rand, Manager of the Novel Battery Technologies Group within the CSIRO Division of Minerals, has received the 1996 Gaston Planté Medal.

The medal is granted by the Bulgarian Academy of Sciences for outstanding achievements in the understanding and development of lead/acid battery science and technology.

## Apprentice Award

The 1995 CSIRO Best First Year Apprentice Achievement Award has been awarded to Sean O'Brien at the CSIRO Division of Manufacturing Technology.



## Don't be bored

By NICK GOLDIE

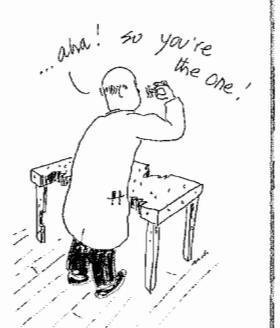
As I sat in my little wooden house in the hills south of Canberra, I was acutely conscious of the thousands of pairs of jaws — or mandibles — that threatened me.

Jim Creffield's new edition of *Wood-destroying Insects: Wood Borers and Termites*, was having the sort of effect that a medical text book has on a hypochondriac.

The book is a nice mixture of the scholarly and the practical: as the cover blurb says, its aim is "to provide architects, engineers, builders, surveyors, foresters, members of the general public with a ready source of reference..." In other words, just about anyone who lives in or builds a house.

*Wood-destroying Insects* was first released in 1991. The new edition has valuable new information about dealing with termites and borers, in the light of recent legislation banning the use of organochlorine pesticides.

The first line of attack, in dealing with termites and borers, is identification. (Perhaps even before the first line of attack is the essential advice: *don't panic!*)



Identification isn't always done by holding the insect up in the light and saying "aha".

In the case of borers, the insects are often hidden away doing their evil deeds, so the best way to identify them is by their style: what sort of damage they do. Termites, on the other hand, can become alarmingly visible.

Jim Creffield's book takes this difference into account, and has clear illustrations of both insects and damaged timber.

While I sat at my (wooden) desk in my (wooden) house, surrounded by (wooden) trees, my feelings went from extreme anxiety to interest, to a certain muted confidence. With friends like Jim Creffield, what termite needs enemies?

*Wood-destroying Insects: Wood Borers and Termites*, second revised edition 1996, is available from CSIRO Publishing.

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# CoResearch

No. 368

November 1996

CSIRO's staff newspaper



## Promise of longevity lures PM to healthy luncheon

BY ROSIE SCHMEDDING  
*National Awareness Program*

Prime Minister John Howard says the promise of longevity lured him to launch CSIRO's National Science Briefings at the "Live to 100 Luncheon" at Parliament House on October 10.

"Those of us that seek longevity in politics, of course, are attracted by such titles and such descriptions as that," the Prime Minister told more than 80 parliamentarians, food industry representatives and media at the lunch.

The Live to 100 Luncheon, hosted by the CSIRO Division of Human Nutrition, was the first of a series of briefings showcasing the benefits of scientific research.

The theme of the luncheon was that eating the right foods will help prevent diseases and lead to longer, healthier lives — and that we need science to tell us how to do it.

The Prime Minister said the lunch was a very practical demonstration of the valuable role that science, engineering and technology have to play in our daily lives, the way that we can develop our country and make the most of our export potential.

"Anything that can enhance the reputation of Australian-grown food produce, as an aid to a healthy lifestyle, to combating degenerative disease and as an aid to prolonging life through the teaching of sensible diet and sensible nutrition is something that should be applauded," he said.

Professor Richard Head, Chief of CSIRO's Division of Human Nutrition, told the gathering that protective foods — which actively improve health — are the latest phase of our scientific understanding of the role of diet.

"Diet-related diseases include coronary heart disease, hypertension, stroke, non-insulin dependent diabetes, various cancers and osteoporosis," Professor Head said.



Eating well: The Prime Minister, Professor Richard Head and Murray Rogers survey the food at the Live to 100 Luncheon

"As I speak to you today, two people could die of cardiovascular disease and one from cancer. We believe that up to a third of all cancers may be diet-related and so it should be

possible to reduce these deaths by dietary means."

Professor Head said he anticipated there would be constant discovery of foods with defined health potential that

would protect against the onset of disease and lead to a healthier old age, with an associated reduction in health care costs.

Murray Rogers, Chairman of the Australian Food Council, stressed the importance of R&D and its role in the economic development of Australia.

He discussed new prospects arising from gene technologies, the promotion of healthy practices and fostering a competitive edge to meet market demands.

Scientists from the Division of Human Nutrition and caterers from the Hyatt Hotel designed the menu of healthy yet delicious dishes. It included ocean trout flavoured with lime and ginger, accompanied by a salad with yoghurt dressing, chicken with a macadamia nut crust, brandied fruits with orange zest custard and a tropical fruit meringue.

These were washed down

with red wine and tea (for their anti-oxidant properties).

The menu came with notes assuring lunch guests that the orange zest custard (which was particularly scrumptious) contained calcium, a nutrient that is essential for bones and offers protection from osteoporosis, and that the ocean trout contained n-3 fats to lower blood pressure and blood clotting and provide cardiovascular protection, among other things.

The general verdict on the food was that it was wonderful.

The National Science Briefings will be run at Parliament House over the next few months as part of the National Awareness Program, under the aegis of the Minister for Science and Technology, Peter McGauran.

They aim to make science more accessible to decision

*continued next page*

## A hands-on role for students

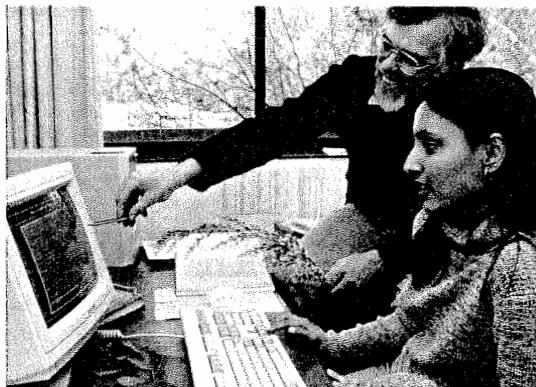
BY MARIAN HEARD  
*Education Programs*

Variations in the infrared spectra of vegetation, particle size in various brands of insecticide and enhancement of a computerised decision support system were just some of the projects undertaken during the 1996 CSIRO Student Research Scheme.

The Scheme allows selected senior secondary students to participate in "real" scientific research with practising scientists.

About 300 students completed projects in 1996 and 315 scientists have a deep sense of satisfaction and a few more grey hairs from helping them.

Initiated in Canberra in 1982, the Scheme has been operating nationally since 1993 through local CSIRO Science Education Centres.



Indu Malik and John Ive at work on SELECTOR at the Division of Wildlife and Ecology in Canberra.

The Institution of Engineers, Australia and CSIRO are national sponsors of the Scheme.

Each year many individual success stories demonstrate the contributions that students can make to the research being undertaken by scientific organisations.

In Canberra, two Year 12 students, Indu Malik and Tanya Whiteway, worked with John Ive at the Division of Wildlife and Ecology on the enhancement of SELECTOR — a computerised decision support system that selects appropriate native species for the particular geographical and

environmental situations facing tree planters.

Student Research Scheme students have been involved in researching and compiling an enhanced SELECTOR database for several years.

Students research relevant texts on the species and provide descriptive synopses of the information that they enter into the established database.

The Student Research Scheme has benefits for both scientists and students. The scientists gain very able research assistants to follow up areas of research they do not have time to pursue, and the students gain the unique experience of scientific research in real life.

For further information, or to register interest as a supervising scientist, contact: Marian Heard, CSIRO Education Programs, on (06) 276 6485, or email: marian.heard@helix.csiro.au.

# The 'new' CSIRO

CoResearch sought Chief Executive Malcolm McIntosh's views in late September about CSIRO's progress in implementing the restructuring and his views for the future

CoResearch: Dr McIntosh, plans for the Sectors are advancing following Executive consideration of presentations at the August Outlook Forum. How is the 'new' CSIRO shaping up?

Dr McIntosh: There are several new ways of doing things in CSIRO, of which the Sector planning approach is probably the most significant. Underpinning the new Sector approach has been an agreement by Minister Peter McGauran that, provided CSIRO gets its 30 per cent external earnings overall, it is our business as to how we allocate targets among various areas.

The stage we have reached now is that we have completed and reviewed the Sector outlook documents. The Executive has given each of the Sectors an indicative appropriation amount and an external earnings target, acknowledging that if somebody really has a compelling case we might have to change it a bit. We've made a number of the appropriations conditional on Sectors getting more external earnings.

Some of those approaches are significantly different to what we've done before. Whilst the overall financial changes aren't dramatic there is a lot of scope for doing quite a bit to reorganise our work.

What happens next?

Next step is these indicative statements go back to the Sectors and their Advisory Committees. These Committees are the dominant element of the next step of the process. We put a lot of time and money into setting up these groups of advisors and we are certainly not now going to ignore them.

The Deputy Chief Executives have very clear mandates to get

out there and make sure the Committees do what we've asked them to do. The main question for them is that, granted this indicative amount of money, what should we — CSIRO — spend it on, what do you — the industry — want done in your Sectors, both short and long term?

What areas do we want to be in, what areas do we want NOT to be in?

We are making clear to Divisional Chiefs that they no longer make decisions on their own, they need to sign up with the relevant Advisory Committees. They've got to go through this consultative process before Christmas.

What we are saying to Divisions is don't necessarily expect to see huge changes in Divisional appropriations, what we expect you to do is to look across the Sectors and figure out how to rebalance your activities across the Sectors.

We expect this process to be the dominant influence on the science, but while all that is going on we have mergers of some Divisions, which is going to make life a bit complicated for some administrative staff. We are trying to help that process by freezing recruitment of admin staff to give everyone a chance to redeploy.

Separate to that, to complete the picture, is the zero basing of corporate groups, which is an interesting and potentially painful process.

What about staff involvement in the changes?

Because of all the changes there is and will be a fair degree of uncertainty about the place. I think it is extremely important to keep staff informed. We are having discussions with the union as to ways of doing this.

## CSIRO wins R&D role in Indonesia

CSIRO has been invited to provide R&D assistance to the Indonesian national research agency LIPI.

The Indonesian Government selected CSIRO after international competitive tendering by the research agencies of several countries, including Germany, Korea and The Netherlands.

Chief Executive Dr Malcolm McIntosh says: "CSIRO will now enter into negotiations with LIPI to finalise the contract. "We will be providing assistance on R&D management to LIPI, with the emphasis on assisting LIPI to become an efficient contract research provider."

## Three messages about our future

• Above all else we have to keep the quality of our science up. That means development of the staff we have, recruitment of very able people to bolster them, and provision of all the right sort of support facilities.

• Within that framework we must manage our money sensibly. We're not going to get any more and if we start mucking it up and making losses or other things that demonstrate we are incompetent, we will start losing it. We will lose government support.

• We must do a better job of explaining ourselves to the people who pay for us and in particular the wider community of taxpayers. And that's the National Awareness Program.

An interesting issue relates to the role of union officials or elected representatives. I'm quite happy to use unions as representatives of our staff in fairly traditional circumstances but I'm not prepared to disenfranchise non-union members from these current change processes.

I want Divisional Chiefs to provide opportunities for all those staff who want to contribute views to the change process to actually be able to do it.

Are there other changes you want to see?

We really have to do something about remuneration. I am extremely keen that we provide a degree of flexibility in remuneration which is not there now.

I would like to see a mechanism that allowed us to reward excellent work without necessarily promoting someone permanently to a higher level, when there may not be such higher level work available routinely. I hope the Remuneration Working Group will be able to look at this issue. Our current system is too rigid. The Reith Industrial Relations bill may also give us some complications.

By the time you take our pay system, where people work, how they work and what they're working on, there isn't much that isn't being changed somehow.



## Fitness track opened

Chief Executive Dr Malcolm McIntosh opened a fitness track on Black Mountain in Canberra on August 2.

"The ancient Romans understood the importance of *mens sana in corpore sano* — a fit mind in a fit body," Dr McIntosh said. "CSIRO encourages all its employees to maintain a healthy lifestyle.

"This has two effects: it improves the individual's quality of life, and it helps CSIRO achieve its research objectives. One hundred minutes of exercise per week is time well spent."

What reactions are you getting from stakeholders about our changes?

The general feeling I'm getting from all sorts of people is that we seem to be back on the road. People are keen to see us doing science, not hogging the news headlines for other than science reasons. That's happening. Getting Julian Cribb was quite a coup, because we needed a refocusing of our media activities.

Our stakeholders are also keen to see us play a role in policy and industry development. We've always played a role in policy and we are saying quite openly we are going to continue to do so from a science point of view.

The Government seems broadly happy with us and industry seems to be pleased we are over our rocky patch and can get back to doing useful things for them.

## Three cheers for Jim's beers

The National Awareness Program has given its inaugural award for excellent science communication to Dr Jim Peacock and the Division of Plant Industry (PI), for a media release on barley genetics that just ran ... and ran ... and ran.

The story was about a technological breakthrough that enables PI researchers to insert genes into barley more efficiently — in particular, genes that will help the brewing industry to produce finer beers.

The story ran in more than two dozen newspapers, including most of the national dailies, major regionals and rural press, totalling well over 300 column centimetres of type, plus nearly an hour of radio and television. It also featured on TV in Hong Kong and California.

What did the trick was the neat link between good science and a substance of personal interest to the average Aussie.

Media editors typically don't know (or care) a great deal about science, but they can certainly pick a story that grabs the average reader, viewer or listener.

In the process, the PI release helped to make the topic of gene-modified food just a little bit more user-friendly for the general public.

## Healthy luncheon

from previous page makers and the media and thus encourage improved public policy.

The briefings are being sponsored by the Australian Academy of Science, the Australian Academy of Technological Sciences and Engineering, Australian Research Council, CRC Association (Cooperative Research Centres), CSIRO and the National Health and Medical Research Council.

The menu and some recipes from the Live to 100 Luncheon and other nutrition fact sheets are available from Jan Stokes at the Division of Human Nutrition on (08) 8303 8808.

Professor Head's speech plus the menu, diet information and slides used during the presentation are available on the Internet at: <http://www.dhn.csiro.au/liveto100.html>

# Agreement with Dutch 'sister organisation'

CSIRO has signed a two-part Agreement for Technological and Scientific Cooperation with the Netherlands Organisation for Applied Scientific Research (TNO).

The agreement was signed in June by CSIRO Chief Executive, Dr Malcolm McIntosh, and representatives of TNO.

The signing of the Relationship Agreement and a Confidentiality Agreement was witnessed by the Minister for Science and Technology, Peter McGauran, and visiting Netherlands Minister for Trade, Anneke van Dok.

Collaboration between The Netherlands and Australia has been especially strong in the fields of biology, chemistry and astronomy.

Opportunities for science and technology cooperation have been greatly enhanced since Australia gained access to the European Commission framework programs.



Signing the co-operation agreement: From left, Anneke van Dok, Peter McGauran and Malcolm McIntosh

# Budget's give and take

BY HERMINA MARTZ

## The recent Federal Budget was a mixed bag

On the one hand, the Commonwealth Government has given CSIRO an additional \$125 million in Appropriations over the coming year and next triennium (1996-2000).

On the other hand, it requires us to make asset rationalisations and other efficiency savings payments of \$135 million over the same period.

For example, it has also imposed an additional two per cent efficiency dividend on the whole of Government activities, but rebated in Appropriations the portion (70 per cent) that applies to research projects.

In addition, it has imposed sales tax on the 'remuneration related' car fleet for all Government agencies.

## CSIRO AND THE 1996 FEDERAL BUDGET

	1996/97 \$m	1997/98 \$m	1998/99 \$m	99/2000 \$m	Total \$m
<b>INCREASES</b>					
1. Base Restoration — election promise	0.0	20.0	20.0	20.0	
2. Supplementation for extra efficiency dividends	8.8	12.0	15.4	18.9	
<b>Total increases</b>	<b>8.8</b>	<b>32.0</b>	<b>35.4</b>	<b>38.9</b>	<b>115.1</b>
<b>DECREASES</b>					
1. Extra efficiency dividends (2% on 30%, 3% on 70%)	-11.3	-14.6	-18.0	-21.5	
2. Minor cuts (superannuation/telecommunications)	-0.4	-0.7	-0.8	-0.9	
3. Revenue measures (repay asset sales etc to govt)	0.0	-10.0	-20.0	-30.0	
<b>Total decreases</b>	<b>-11.7</b>	<b>-25.3</b>	<b>-38.8</b>	<b>-52.4</b>	<b>-128.2</b>
<b>Net effect of "direct" charges</b>	<b>-2.9</b>	<b>6.7</b>	<b>-3.4</b>	<b>-13.5</b>	<b>-13.1</b>
<b>INDIRECT EFFECTS (ESTIMATE)</b>					
1. Motor vehicle tax	-0.7	-0.7	-0.7	-0.7	
2. Increased interest on \$20m	0.0	1.4	2.1	2.1	
<b>Total for indirect effects</b>	<b>-0.7</b>	<b>0.7</b>	<b>1.4</b>	<b>1.4</b>	<b>2.8</b>
<b>TOTAL BUDGET IMPACT</b>	<b>-3.6</b>	<b>7.4</b>	<b>-2.0</b>	<b>-12.1</b>	<b>-10.3</b>

Figures are expressed relative to the beginning of the four-year period, not relative to the previous year. Previously known factors are excluded, eg inflation adjustments, original efficiency dividend

So where does CSIRO stand financially according to the Budget?

The net effect is, in fact, a reduction of about \$10 million over the next four years.

The table above clears up some of the confusion. Outside our Appropriations,

there are likely to be some impacts on our external earnings.

We are also likely to suffer some losses through the reduction in the R&D Tax Concession Scheme from 150 to 125 per cent and the abolition of tax syndication.

This reduction is likely to slow industrial investment in R&D and will probably affect the R&D investment plans of some of our research partners or potential research partners.

However, the Government's ambitious environmental plans could see significant new work coming CSIRO's way.

In an interview on page 2 of this issue, Dr McIntosh says he believes CSIRO can cope with the Budget outcome through our restructuring and rationalisation of administration.

## Planning schedule

Dr McIntosh has issued the 'CSIRO Strategic Directions' statement in response to the sector presentations made at the Outlook Forum held in August.

This document is on our WWW pages at <http://www.csiro.au/services/planeval/directions/contents.htm>

Chiefs, in consultation with Sector Advisory Committees, will now begin the intra-Sectoral priority setting and planning process and will involve Divisional staff in discussions.

Sector and Alliance meetings were held during October and will continue in November leading up to the finalisation of Sector plans.

These plans will be submitted to the Chief Executive in mid-December and will go to the Board for approval in February 1997.

The Divisional budgets will flow from these Sector-based plans.

## Sector news

BY JENIFER NORTH

The intent is to achieve the desired inter- and intra-Sectoral shifts without modifying current Divisional budgets.

### More opportunities

"The new Sector structure is making it easier for us to collaborate with colleagues in other Divisions," says Dr Katrine Baghurst of Human Nutrition.

As part of the move towards a sector approach, and to capitalise on synergies in the consumer-related work of the Divisions of Human Nutrition, and Food Science and Technology, a new cross-

divisional program in Consumer Science was formed in July 1996 with Katrine as Acting Program Manager.

She is now on the Divisional Management Committees of both the Human Nutrition Division (DHN) and Division of Food Science and Technology (DFST) and this enables her to learn more about areas where both divisions can cooperate and optimise their interaction with their common food industry client base.

"In the past, synergies between the Consumer Research Program of DHN and the Sensory Research Centre in DFST had been identified but the development of the sector approach has led to a more structured approach to collaboration," Katrine reports.

"The new sector arrangements have also opened up the possibility for the Division of Human Nutrition to work in a more collaborative manner with the Division of Biomolecular Engineering and other divisions in the

Pharmaceutical sector, to better service their food-related pharmaceutical industry clients.

"For our Division, it has already served to broaden our knowledge about the existing and potential CSIRO client base in both the food and pharmaceutical industries as well as helping our existing clients get a better understanding of the range of research capabilities within CSIRO."

### Web pages

Enhanced Sector WWW pages are now available for public viewing on <http://www.csiro.au/csiro/structure/index.html>.

This is stage two in an evolving process to provide useful Sector research information to staff and external web users.

Throughout the next six months more information will be provided or linked in as Sectors decide on what information is important to convey.

# Short shots

## Award for telescope web site

The Australia Telescope Compact Array has won an award for best Australian scientific site on the Internet.

The award was presented as part of the first annual Australian Financial Review/Telstra Australian Internet Awards.

The site, called 'ATCA Live!', started in May this year. It is updated every 10 seconds, to reflect the operation of the observatory and special astronomical events.

Its address is: <http://www.nar.atnf.csiro.au/www/public/atca-live/atca-live.htm/>

## Guilt-free salami

Dr John Pearce, from the Division of Food Science and Technology, has developed a revolutionary technology to replace the fat in processed meats with low-fat whey.

Whey is a by product of dairying and cheese-making. The new low-fat manufactured meat contains about 75 per cent less fat than normal processed meats, but has the same juicy qualities and flavour.

Dr Pearce's unique process uses a new method for separating whey proteins in bulk to make a gel that looks and feels like fat, but is really 90 per cent water. The gel is as tasty and nutritious as lean meat.

## Artist-in-residence for DIT

CSIRO's Division of Information Technology has received funding from the Australia Council for a digital media artist-in-residence.

The grant of \$35,000 will provide for the annual salary of the artist who will work as part of the information team in the Division and be able to use its sophisticated hardware and software.

DIT's Chief, Dr John O'Callaghan, says the convergence of the computing, communications and content industries is creating an opportunity for innovation from multi-disciplinary teams.

## Learning from moles

Not all moles are small insectivorous animals. Researchers at the CSIRO Division of Water Resources in Griffith have developed mole drainage, a relatively cheap method of subsurface drainage that irrigators can use to reduce waterlogging and salinity in the root zone of crops.

The technique involves using a tractor to pull a mole plough through the soil to create holes and a series of cracks that act as a drain to remove excess water after irrigation or rainfall.



*David O'Brien is not (despite appearances) a chef. The cabinet behind him contains an atmosphere (like Port Melbourne) of salt sea spray, or as David prefers to call it, a Climate Simulator Which Duplicates Climatic Conditions and Aerosol (Sea Salt) Variations. It is being used to test metallic building materials. David is with the Division of Building Construction and Engineering in Highett (Vic.).*

The mole channels are installed about two metres apart and are usually 50 to 80cm deep.

## Creating a stir to fight algae

CSIRO researchers have discovered that stirring the layers of water in waterways can help prevent toxic blooms of blue-green algae.

A team of scientists, led by Dr Ian Webster of the CSIRO Centre for Environmental Mechanics, has found why algal blooms occur when a river's flow slows down, usually in summer.

Sunshine creates a surface layer of warm water, causing the blue-green algae to float up to the warm layer, where they absorb light, and grow to plague proportions.

But if the warm layers can be mixed through the depth of the river, a bloom does not occur.

The work by Dr Webster and colleagues from the CSIRO Division of Water Resources and the CRC for Freshwater Ecology was the culmination of three years' research at Maude Weir on the Murrumbidgee River.

## Fighting fox fertility

A fox immunocontraceptive vaccine in a bait will be the most effective way of controlling foxes in future, according to Dr Peter Bird of CSIRO's Division of Wildlife and Ecology.

The aim of an immunocontraceptive vaccine is to

lessen the natural fertility of a specific species, so the population declines.

Dr Bird and his colleagues have found one antigen that could be a candidate for the vaccine and work is well advanced to deliver the vaccine orally to foxes. Field trials are planned to start in the year 2000.

At present foxes are usually controlled in rural areas by shooting or by poisoned baits, which are issued under strict guidelines by land management authorities. A vaccine will be more effective and will pose less danger to other animals.

## Plants for health and nutrition

The Division of Human Nutrition organised the 10th Annual Food Industry Conference at the Adelaide Convention Centre on August 20-21.

The theme for the conference centred on new opportunities in nutrition and health care using plant foods with a protective role in the diet.

Some of the sessions covered: agribusiness; the health perspective; striking a balance with fatty acids; legumes for processed foods; polyphenols: wine and tea; marketing to consumers; food fads: from myth to marketing; and food: is fresh best?

For more information contact Jan Stokes on (08) 3303 8808 or see: [jan.stokes@dhn.csiro.au](mailto:jan.stokes@dhn.csiro.au)

## Anniversary open day

The CSIRO Division of Atmospheric Research held an Open Day on Saturday, October 26, to commemorate its 50th anniversary. Members of the public visited the Melbourne laboratories and CSIRO Science Education Centre staff presented exciting, atmospheric children's science shows.



*Chief Executive Dr Malcolm McIntosh formally becomes a member of CSIRO's Benevolent Fund. Watching him closely are fund representatives (left) Merrie Hepworth (Limestone Avenue) and Benevolent Fund 1996 (ACT) chairperson Liz Dunstan (Black Mountain Library). "Membership has declined in the past year, but demands on the fund have kept climbing," says Liz. "We are delighted to welcome Dr McIntosh as a member!"*

# CSIRO leaves East Melbourne

June 1996 marked the end of an era with the closure of CSIRO's first head office at 314 Albert Street, East Melbourne. Former Albert Street inhabitant Philip Kent looks at some of the building's more memorable moments and characters.

For the past 80 years, CSIRO and its predecessors occupied the 314 Albert Street, East Melbourne, site.

Originally a private home built in 1857, the Albert Street building boasts striking stained glass windows, a turned staircase and marble fireplaces. Its location across from Fitzroy Gardens is attractive and has a gracious charm.

Apart from CSIRO, the building was also home to the Institute of Science and Industry, created in 1921, and the Council for Scientific and Industrial Research (CSIR), created in 1926.

When CSIRO was inaugurated in 1949 under the chairmanship of Ian Clunies Ross, 314 Albert Street became its head office until 1970, when it moved to Canberra.



*The number on the front of the Albert Street Building*

Various sections have been located at East Melbourne during its history. In addition to

the Executive, the 1949 Annual Report lists Editorial, Library, Records, Translation and Cinematographic Sections as well as the Information Service.

Minister (later Lord) Casey instigated the Information Service, which was established in 1938, and there are many stories about Lord Casey and other notables who worked from the site over the years. The gentleman's lavatory on the third floor of the newer main brick building, for example, is known in folklore as Casey's Falls!

Many staff in CSIRO Divisions have worked at or

visited the East Melbourne site. Some even met their spouses there!

The building was sold late last year following the separation of CSIRO Publishing (now located in Collingwood) and Corporate Information Management, which moved to Clayton in June this year.

The site has been bought by a developer who plans to refurbish the five-storey building as apartments.

A cast bronze plaque will be attached to the original building to commemorate the place that has played a major role in the history of our organisation.

# Fishing for a name in the 1930s

BY ALAN PEARCE  
*Oceanography*

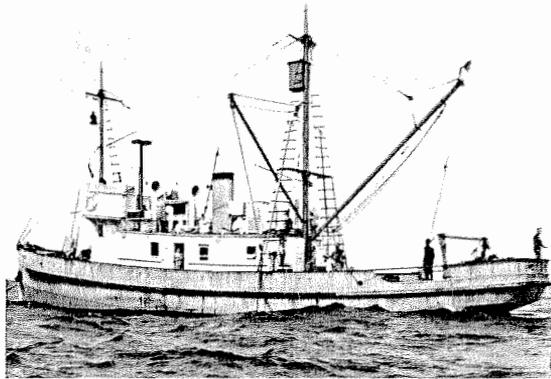
One of the early research groups established in CSIRO in the 1930s was the Fisheries Section, directed by Officer-in-Charge, Dr Harold Thompson.

The need for a research vessel to explore the pelagic fish stocks in Australian waters was voiced from the outset, and in 1938 a ship was built at Williamstown Navy Yard in Victoria at a cost of £17,451.

The ship was a 25m purse seiner with a single-screw 215 b.h.p. diesel engine, a range of more than 5000 km and capable of undertaking both fisheries and oceanographic work.

Finding a name for the new vessel caused a flurry of political activity towards the end of 1937 and extracts from the documentation are illuminating.

The issue was raised by Dr Thompson in late September



The *Warreen*: Finding its name caused a flurry of political activity

because of the need to register the ship as a radio ship station.

In a letter to the acting Secretary of CSIRO he suggested that "the name should be euphonious, should signify the sea or its inhabitants, that it should be non-controversial and that it should not imply that special attention is to be given to any particular fish species". He also felt that a "native

name" might be appropriate.

Thompson had approached the National Museum for suggestions and a Mr A.S. Kenyon suggested the following possibilities: Sea (*Warreen*, *Warrin*, *Warringa*), Ship (*Corong*, *Kooron*), Fish (*Malloren*, *Mallun*) and Investigate (*Quanthee*).

Thompson recommended that Fisheries Investigation staff

were of the unanimous opinion that the vessel should be named *Warreen*.

This brought a telegraphed response from David Rivett, Chief Executive Officer of CSIR: "MINISTER NOT IMPRESSED WITH NATIVE NAMES FOR BOAT SUGGESTS COMMEMORATING SOME INDIVIDUAL WOULD YOU APPROVE DANNEVIG".

(Dr Harald Dannevig was appointed Superintendent of NSW Fisheries Investigations in 1902 and lost his life at sea in the fisheries vessel *Endeavour* in 1914.)

In his reply, Thompson counter-suggested "a simple and expressive name such as M.R.V. Quest".

This resulted in another letter from Rivett in mid-November:

"My dear Thompson, I have just received a note from the Secretary to the Prime Minister's Department saying that Senator \_\_\_\_\_ has intimated that he prefers the name *Malloren* for the boat. It is

not the name which I would have chosen from the list of native names, but as the important thing is to have the matter settled, I take it that we can now regard this as fixed."

Exactly a week later, a memorandum from the acting Secretary, G.A. Cook, to Thompson said: "I desire to inform you that the Minister has now approved the name of the vessel being *Warreen*."

The *Warreen* surveyed coastal and oceanic waters off eastern Australia between 1938 and 1942, when she was taken over by the Royal Australian Navy for war service.

In October 1946 she was handed back to CSIR and after an extensive refit undertook fisheries and oceanographic work off Western and Southern Australia before being decommissioned and returned to the Navy at the end of 1951.

(The CSIR annual reports of the 1930s summarise much of the early research of the Fisheries Section.)

## Awards

### Researcher wins US Ozone Award

Dr Jonathan Banks of CSIRO's Stored Grain Research Laboratory in Canberra has received the United States Environment Protection Agency's 1996 Stratospheric Ozone Protection Award.

The award recognises his exemplary efforts to protect the ozone layer by limiting the use of methyl bromide, a fumigant that has been identified as a significant cause of ozone depletion in the atmosphere.

As the inaugural Chairman of the International Methyl Bromide Technical Options Committee, Dr Banks was largely responsible for a major report recommending ways to limit methyl bromide use.

The report has been adopted by the nations that have signed the Montreal Protocol on protection of the ozone layer.

### Life Membership for CRC Director

The new Director of the Cooperative Research Centre for Australian Mineral Exploration Technologies, Dr Brian Spies, was recently awarded life membership of the Society of Exploration Geophysicists.

He was also elected for



Dr Brian Spies: Awarded life membership of the Society of Exploration Geophysicists

1996-97 as secretary-treasurer of the society, which has 14,000 members throughout the world.

An Australian geophysicist who is now a senior member of the CSIRO Division of Exploration and Mining, Brian has spent the past 17 years in the United States working in both mineral and petroleum exploration research.

### International Science and Technology Program winners

Three CSIRO scientists have won grants under the Federal Government's International Science and Technology Program.

Dr Brian Embleton, head of the CSIRO Office of Space Science and Applications, won two awards. He will receive a total of \$48,000 for

collaboration with Japanese scientists on data network services for satellites and with Chinese scientists on the use of remote sensing for environmental monitoring.

Professor Graham Harris of CSIRO's Environmental Projects Office will receive \$25,000 to improve water quality, reduce coastal erosion and enhance land use and delta control in Indonesia.

Dr Ken Old, a scientist with CSIRO's Division of Forestry and Forest Products, received \$7,000 towards a survey of diseases in Australian acacias and eucalypts in Indonesian plantations.

### US Innovative Technology Award

Dr Keith Millington, Principal Research Scientist at CSIRO's Division of Wool Technology, received the Innovative Technology Award at the Radtech '96 Conference in Nashville, Tennessee, earlier this year.

The award was for his paper on the Siroflash process, which details how ultraviolet technology can be applied to wool textiles to prepare them for printing and to prevent pilling of wool knitwear.

The award was made by the Association for the Advancement of UV/EB Technology at the week-long, biennial conference, which attracted more than 1500 delegates from around the world.

# Melanoma camera to save lives

BY HERMINA MARTZ

Mathematician Dr Mark Berman has developed a life-saving technology to help general practitioners diagnose melanomas in their surgeries, reducing the need for costly biopsies.

Australia has the world's highest melanoma rate, with more than 1000 Australians dying each year from this most dangerous form of skin cancer.

The technology uses a special camera linked to a personal computer to produce faster and less invasive testing and diagnosis of melanoma.

Dr Berman, from the Division of Mathematics and Statistics, revealed the news about the innovative instrument while addressing the recent Australian and New Zealand Association for the Advancement of Science congress.

"Most GPs don't have enough knowledge themselves to look at a lesion and be able to determine whether it's a melanoma or not," he said. "What you're basically doing is capturing the expert knowledge in the computer."

The skin lesion is coated with

a film of oil and a piece of glass is pressed to the area before the potential cancer is viewed by a low-power microscope.

The instrument automatically gathers and processes information about the colour, texture, symmetry and regularity of the lesion.

Dr Berman said the key to the system was digital image analysis in which a special camera converted pictures into numbers. "Sophisticated algorithms and software are used to process those numbers in a way which mimics the human eye," he said.

A prototype camera is expected to be launched at the World Melanoma Congress in Sydney in July next year.

Researchers hope the new technology will be in some surgeries by the year 2000.

Dr Berman said there was a high cure rate for people whose melanomas were diagnosed early, so there is the potential for many lives to be saved.

The technology has been developed in collaboration with specialists from the Sydney Melanoma Unit and an Australian medical instrument company, Polartechnics.

# Program to lift profile of science

BY JULIAN CRIBB

**CSIRO consists of 1001 fascinating stories about discovery and human achievement, mixed with dogged determination and some genuine characters.**

As a journalist, it's been my privilege to tell quite a number of those stories in one medium or another, for almost 25 years.

So when I was invited to help spread the word about a few more, this time from the inside, it was a chance I could scarcely pass up. Hence the National Awareness Program, or NAP for short.

NAP is about communicating science — *your* science. Our aim is to make industry, the public and decision-makers more aware of what your science can do for them.

We hope to help make your science better known and thus more valuable to Australia.

NAP is a small team, just 5.5 in all. And we're part of a much wider effort by

Divisions, Sectors and Alliances to market and communicate what CSIRO does. We're here to assist that process in any way we can.

When I came on board four months ago, CSIRO had been through a rough patch. News about internal barneys and shakeups was plentiful, news about science sparse.

Furthermore, 80 per cent of what we were putting out dealt with matters other than our scientific accomplishments. This was not only unjust to our research, but also slightly risky in an economic climate of scorched fiscal earth.

However, recent activities, including magnificent support from Divisional communicators and marketers, many Chiefs and research teams, have raised CSIRO's profile.

Output of national statements has doubled, and the science content has risen from 20 to 43 per cent of all statements. This has been reflected in better treatment of CSIRO in the media.

We intend to keep it up, but we need your help.

Our national awareness effort is being enhanced with the addition of two highly skilled industry communicators, Brad Collis in Melbourne and Dave Berry in Perth.

We have launched the National Science Briefings in Federal Parliament with a "Live to 100 Luncheon" showcasing protective foods for the Division of Human Nutrition and the Australian Food Council (see page 1).

The Briefings are intended to inform politicians, their advisers, the national media and bureaucrats about the latest scientific advances and how they can help make better public policy for Australia.

Twelve are planned in the first year, on topics such as the greenhouse effect, marine science, astronomy, water quality, genetics, food and information technology.

CSIRO has also joined forces with the

science academies, the Australian Research Council, the CRCs and the National Health and Medical Research Council to make a pilot for a series of 100 television items about the latest and greatest Australian scientific accomplishments.

Divisional communicators are the backbone of CSIRO's outreach effort, but NAP is here to help in any way we can — advice, strategy, writing skills, editorial judgment, communication ideas, media contacts and media training.

Above all, we would like to keep in touch with what CSIRO is achieving scientifically. Don't hesitate to give us a call and tell us what you're up to and talk over the prospects for communicating your work.

The NAP team is: Julian Cribb on (06) 276 6244; Wendy Parsons on (06) 276 6615; Nick Goldie on (06) 276 6478; Rosie Schmedding on (06) 276 6520; Brad Collis on (03) 9662 7449; and Trish Blakey on (06) 276 6436.

## Double Helix club hits double figures

**CSIRO's Double Helix Science Club is launching into its second decade and to celebrate special Double Helix family events are being held at sites around the country on Saturday, November 30.**

Activities will include firing water-powered rockets and other "flight" activities.

Also to celebrate 10 years of "science with a twist", a birthday afternoon tea was held recently at CSIRO headquarters.

Special guests included CSIRO's Chief Executive, Dr Malcolm McIntosh; BHP's Public Affairs Manager, Corporate Reputation, Suzi Jotwani; and Dr Andrew Thomas, the Australian-born NASA astronaut.

The main ceremony included a colourful performance by the Telopea Park Double Helix Science Circus.

Dr Thomas was then involved in a rocket launch a little

different to those he is used to: he set off a water-powered rocket, cunningly disguised as the candle on a birthday cake.

BHP has been the major sponsor of Double Helix since 1989. With BHP and CSIRO support, Double Helix has come a long way. In 1986, the club offered a quarterly, eight-page, two-colour newsletter and events in only three centres.

Today, Double Helix has 23,000 members in Australia and 500 in New Zealand. It provides a world-class 40-page, full-colour magazine every two months, staff to organise events in every capital city plus Townsville, more events in 68 Regional Chapters, 380 School Groups, regular national experiments supporting scientific research projects, national TV segments and a catalogue offering everything from bouncing putty to a range of KAOS Kits (Kool and Original Science).

Readers interested in

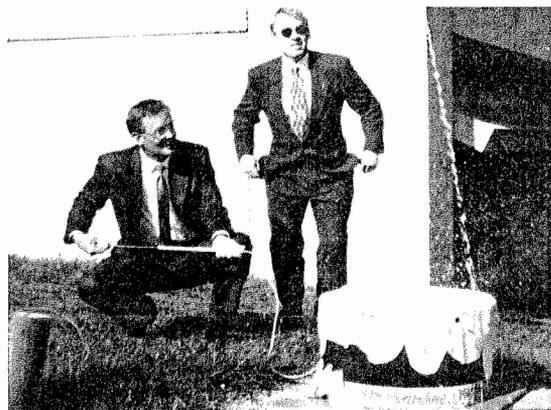
attending a Double Helix family event on Saturday, November 30, should contact the local CSIROSEC or see the CSIRO home page.

Double Helix is making a **limited 10th Birthday SPECIAL OFFER, open only to CSIRO staff and their families:** \$20 for a year's membership, a 20 per cent saving off the regular fee. Simply fill out the form below and return with payment. This offer is valid until December 30, 1996.

Double Helix membership at the normal price makes a great Christmas present — at 20 per cent off the regular membership fee, it's a steal!

Current members may take advantage of the offer by applying on the form below to extend their membership by one year.

Members who simply want to receive the Double Helix catalogue, or anyone requiring more information, should call (06) 276 6643.



Dr Malcolm McIntosh and Dr Andrew Thomas at the rocket launch

## CSIRO process cuts Ok Tedi discharge

**Researchers from CSIRO Minerals have developed a new process to decrease copper levels downstream from BHP's Ok Tedi mine in Papua New Guinea.**

The process will also increase profitability by increasing the amount of copper recovered.

The process raises copper recovery by about four per cent, and significantly reduces the amount of heavy metals and sludge released in the Fly River system at the mine site.

It should also reduce energy consumption and maintenance — and all for a relatively small cost.

Trials at Ok Tedi have gone so well that a processing line that underwent pilot conversion several months ago has been kept operating while full-scale conversion of the other parallel line takes place.

The CSIRO Minerals solution

is to convert copper hydroxide back to copper sulphide by adding particular chemicals under controlled conditions.

"The important trick in getting the process to work is not to overdose the system," says CSIRO Minerals research team leader, Dr Geoff Senior.

The CSIRO team was able to determine exactly the right amounts by simulating the conditions at Ok Tedi in a small version of an industrial flotation cell set up in the laboratory.

They measured precisely the impact of changing the chemistry of the cell mixture.

Recovering more copper and gold from ore means less copper and particularly less copper hydroxide finding its way into the river.

Dr Senior says the new copper recovery process shows that a positive environmental outcome can go hand in hand with increased productivity.

### CSIRO DOUBLE HELIX SCIENCE CLUB

Mr/Ms..... Date of birth...../...../.....

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# Software en route to China

The Division of Building, Construction and Engineering has signed a cooperative agreement with a locally listed firm, China Construction and Engineering Ltd, to investigate the commercialisation of CSIRO's route optimisation software, Align3D, in the People's Republic of China.

The company is a wholly owned subsidiary of China Construction Holdings (CIH), which is controlled by China's Ministry of Construction.

The Chief of the Division and Infrastructure Sector Coordinator, Larry Little, says: "The Align3D software

represents a significant improvement on conventional road planning techniques and has demonstrated its ability to consistently cut construction costs by more than 30 per cent.

"We will be working with CIH to identify the best way to introduce Align3D into China, and we look forward to a successful collaboration.

## Satellite images

The CSIRO software, developed by Dr Peter Gipps and Kevin Gu, uses satellite images and optimisation techniques that minimise the amount of earthworks to identify a set of low-cost routes that meet the constraints set by local planners.

When trialled on the Albury-Wodonga bypass, it

demonstrated that it could reduce planning time by 12 to 18 months and cut construction cost by more than 30 per cent.

The deputy chairman of CIH, Nelson Chiu, says it is estimated that US\$500 billion will be invested in infrastructure developments in China over the next 10 years. Close to US\$100 billion of this will be invested in the construction of railways and highways.

Mr Chiu believes the CSIRO software could "significantly reduce the cost of these major construction projects".

"This will allow China to increase the amount of infrastructure that can be developed from available funding and CIH would seek to maximise Align3D services in China," he says.



Bruce Thomas, Director of China Construction (left), signs the cooperative agreement with Larry Little, Chief of Building, Construction and Engineering



Victorian Premier Jeff Kennett: Committed to act on Bay study

## Friend of the dolphins

Victorian Premier Jeff Kennett has commended the work of CSIRO as managing authority of the Port Philip Bay Environmental Study.

The study, principally funded by Melbourne Water, was one of the largest multi-disciplinary studies ever run by CSIRO.

On July 31, the final report was handed to Premier Kennett by Chief Executive Dr Malcolm McIntosh, who said that although the study showed Port Philip Bay is in remarkably good condition, with excellent water quality and stable fish numbers, several looming problems will place increasing pressure on the Bay's natural systems.

The Kennett government issued a policy statement in March in which it committed itself to act on the recommendations of the study.

## Report predicts \$1.6b return on three commercialised projects

An economic evaluation of three commercialised CSIRO research projects found they could return more than \$1.6 billion to the Australian community.

The report — *An Economic Evaluation of three CSIRO Manufacturing Research Projects* — was conducted by researchers from the Bureau of Industry Economics for the CSIRO Institute of Industrial Technologies.

The projects — an anti-flu drug, a smart battery tester and an improved industrial oxygen sensor — were chosen as examples of CSIRO projects in the manufacturing area that had been successfully commercialised.

CSIRO Deputy Chief Executive Dr Colin Adam says

the world leading-edge research into an anti-flu drug will save lives, dramatically lower the number of work days lost and cut medical costs.

Along with royalty payments from overseas sales of the drug GG167, the community as a whole would gain between \$291 million and \$1.5 billion for a research outlay of \$66 million, Dr Adam says.

GG167 arose from study of influenza over the past two decades, costing more than \$65 million.

Subsequent development was funded by the Australian biotechnology firm Biota, and the multinational pharmaceutical company Glaxo is now conducting clinical trials.

It offers great promise in countering flu, which kills

thousands each year.

The second project, the Smart Test battery tester, is estimated to save between \$23 million and \$66 million by reducing the number of healthy batteries replaced, lowering the number of vehicle breakdowns and improving service in the battery industry.

The tester is a software program that allows batteries to be tested in any state of charge, quickly determining whether failure is imminent.

The research cost \$2.5 million and the technology has been licensed to the Australian firm Test Technology.

The third project, the SIRO2 oxygen sensor, is estimated to save from \$31 million to \$58 million by controlling the mix of gases in furnaces and boilers,

giving firms using high-temperature processes tighter quality control, and saving energy, maintenance and capital upgrade costs.

The sensor, released in 1977, arose from research that started in 1972 into industrial oxygen sensors better able to operate in high-temperatures and corrosive environments.

"The economic study predicts that together the three projects will yield a return of between 4:1 and 20:1," Dr Adam says.

"The three projects are also examples of socially valuable research that private industry would not have supported."

*An Economic Evaluation of three CSIRO Manufacturing Research Projects* is available from Nick Goldie on (06) 276 6478.

## Plastic food wrap for \$1.2b market

By HERMINA MARTZ

A new plastic wrapping material that absorbs oxygen out of food packaging could double the shelf life of many packed foods and corner a big share of the billion-dollar global market for packaging.

After 17 years of research, CSIRO Division of Food Science and Technology scientists say they have found a better way to keep beer, wine and packaged food fresh for longer.

The unique oxygen-scavenging polymer is the

subject of a multi-million-dollar research deal between CSIRO and Southcorp Packaging to further develop the plastic wrap into a commercial product.

The plastic film, called ZERO<sub>2</sub>, which acts like a sponge to "soak" damaging oxygen out of packaged food, could have a world market worth \$1.2 billion a year in four years.

Oxygen is primarily responsible for advancing the discolouration, rancidity and mould growth in packaged foods.

The researchers created ZERO<sub>2</sub> by modifying molecule

chains in plastic wrapping to snare passing oxygen atoms.

The film can be laminated inside plastics to wrap cheese, meat, cakes, long-life breads, TV dinners, nuts and packaged fruit and vegetables.

It can also be incorporated in bottle-tops and applied as a lacquer inside metal cans.

The innovative food packaging may also reduce the need for artificial preservatives and open new export possibilities for the Australian food industry.

Demand from overseas markets for good-quality fresh food is rapidly increasing, so

the use of improved packaging techniques should provide Australia with a real opportunity to lift its exports of food.

By enabling processors to deliver quality foods to distant markets by sea and land, rather than by air, ZERO<sub>2</sub> might open up previously inaccessible markets and also reduce export costs.

Southcorp managing director Graham Kraehe says the process could be a world leader in food packaging.

The first packages are expected to be on the market within two years.

# What's in a name? (or does it vary by degree?)

BY GRANT MCDULING  
(Tropical Agriculture)

**As a new CSIRO staffer,  
the longer I work here the  
more confused I get!**

Now that may not seem strange to those whose service record, in years, is longer than mine is in days, but let me explain anyway.

As a professional communicator, I honed my craft after spending six years at university being taught by skilled scribes and others more learned than I on how to "tell it like it is".

Reading philosophy at undergraduate level sharpened my view on life. I always knew the medical world to be a bit odd — I mean, imagine spending years at university only to go out into the world to start practising! Hell, I did all my practising before the serious stuff.

And then doctors delight at progressing up through the ranks until the stage where they can call themselves Mister! I was a mister all along.

Until now, I had never even seen a scientist before, let alone spoken to one! And now they're everywhere!

The strange thing is that they seem to be a bit of an enigma. Neither this or that — pushing

back the frontiers of knowledge while remaining firmly entrenched in their ways.

Corporate culture, they say. Corporate what? Why is it that what most regard as an opportunity, corporate culture labels a threat? Very curious.

Longevity (from a career point of view) seems to be the name of the game.

But every journo worth his ink knows that adaptability to flow with the wind works wonders in increasing his chances of making it through to retirement unscathed.

I've also noticed another, dare I say, scientific trait. Corporate culture calls it the tall poppy syndrome.

I would have thought that in this regard, scientists are in much the same boat as journos. Consider this.

Scientists by nature are seeking the unknown. And when they discover it, they dash headlong into producing what they call "a paper".

The reason for this, it seems to me, is to raise one's profile.

Journos are no different — they are driven by the same desires. Creative juices flow as a profile-raising exercise.

But get this. Journos produce "papers" every day and so become unfazed by it all.

It's no big deal and certainly

no threat. Challenge, yes! Opportunity, certainly. But threat, heavens no!

Getting back to philosophy, I've also discovered that the world of science is also an enigma. "I think, therefore I am" would cut no ice in the tropical laboratory where I exist!

I always assumed, quite foolishly I now know, that the ultimate goal of any reader of philosophy was to be awarded the degree Doctor of Philosophy. (Well that, and self discovery, of course.)

I also assumed that scientists, quite obviously, had Doctor of Science degrees. How wrong I was.

One thing I have learned since elbowing my way in to the scientific community is not to assume anything. You see, I soon found out that just about all scientists have Doctor of Philosophy degrees. How very odd.

I then noticed that many CSIRO communicators have science degrees and not arts degrees. Have I missed something?

I shudder to think where I would be today if I had studied politics.

Maybe I am already beginning to tap into the veins of this thing they all call corporate culture.



## PVC gets clean bill of health

A CSIRO report that gives PVC a clean bill of health as a building material was launched by Minister Peter McGauran in the Mural Hall of Parliament House on September 12. Pictured (from left) are the report's author, Dr Russell Smith of the Division of Chemicals and Polymers, Peter McGauran, and the Chief Executive Officer of the Plastics and Chemical Industries Association, Michael MacKellar.

# Eliminating workplace harassment

**Harassment can include a wide range of offensive behaviour, intentional or unintentional, which causes another person or group of people distress.**

The behaviour is unwanted, unsolicited, usually unreciprocated and usually (but not always) repeated.

It makes the workplace unpleasant, humiliating or intimidating for the staff targeted by this behaviour. Harassment undermines productivity and a harmonious working environment.

Harassment is inconsistent with the principles of equal employment opportunity. It generally occurs in a situation where the balance of power is unequal and when power is improperly used to disadvantage an individual or group of people.

Workplace harassment may include:

- interfering with a person's work space, work materials, equipment or property, apart from that which is necessary for the work of the area;
- distributing or displaying pictures, written material and posters that are offensive or obscene;
- making offensive jokes, suggestions, or derogatory comments about another person's racial or ethnic background, gender, sexual preference, disability or physical appearance; and
- using implicit or explicit coercive sexual behaviour to control, influence or affect the career or job of another person.

EEO officers are available to talk about any problems regarding EEO matters. More information about EEO in CSIRO and generally is on WWW at: <http://www.csiro.au/services/hr/eo/articles/contents.htm>.

## Electronic news ends

**CSIRO has decided to abandon Staff News, its electronic news bulletin for staff, after a trial period of several months. The experimental site, announced in March, was in the Corporate Services part of CSIRO's WWW pages.**

Corporation Communication Manager Jenifer North says the

site is now being expunged. "Very few staff expressed interest or provided news and my group has no time to chase up items," she says.

"An electronic version of CoResearch is something we would still like to consider for the future but the resources needed to make it an interesting and worthwhile communication channel are just not here at present."

# CSIRO role in space effort

**A major restructuring of Australia's space effort has resulted in a new and significant role for CSIRO.**

The highlight of the new space policy is a program to launch a small experimental satellite.

The redirection of Australia's space effort is due to several factors.

Although satellite technology is coming of age in assisting farmers and miners, and in environmental and climate monitoring, Australia's special requirements often cannot be fulfilled by other nations' satellites.

The micro satellite mission, to be known as FEDSAT, will conduct scientific experiments to prepare for practical applications such as earth

observation and communications.

The satellite program is to be an integral part of a Cooperative Research Centre proposal being prepared by CSIRO in collaboration with appropriate partners.

Recent Budget statements indicate the Government expects the first satellite to be orbited during the centenary of Federation in 2001.

The restructuring, however, is more fundamental than this one project.

The Minister for Science and Technology, Peter McGauran, has announced that CSIRO will have prime responsibility for planning and executing space programs on behalf of the Government, in conjunction with other departments and

instrumentalities that use space, universities and industry.

The restructuring involves establishing a small Space Policy Unit in the Department of Industry, Science and Tourism to maintain an overview of international space activities and set policy in the national interest.

A Space Activities Board is also to be set up by CSIRO, involving the above groups and the Unit. The Minister will chair meetings of the Board from time to time to assess progress and guide future directions.

The Minister has also agreed to transfer to CSIRO the activities of the NASA tracking station at Tidbinbilla, to facilitate greater synergy with CSIRO's existing world-class radio astronomy and radiophysics activities.

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