CSIRO

co:research

CSIRO's staff magazine
No. 390 Autumn 2002

THIS ISSUE

On a tray: *Dr Long Yu showcases biodegradable packaging samples.*

Green packaging company poised to profit

CSIRO research is responsible for the success of a biodegradable-packaging company that stands poised to accept its first large orders from multi-national companies. The company, Plantic, expects sales of $100 million within five years. CSIRO stands to profit from this. BY **MEGAN BIRD**

Manufacturing Science and Technology's (CMST) Dr Gregor Christie said: "It's a pretty good deal. It's not one that's slipping away."

CMST began work on the cornstarch packaging seven years ago.

The result is a material that can be used for dry biscuit trays, 90 per cent of which will break down within a few weeks when composted. It is almost pure starch, but with plastic-like qualities.

CMST identified the starch, additives and processing methods and funnelled this research into the CRC for International Food Manufacture and Packaging Science, where it was developed.

Ministerial advice: *Dr Malcolm Jenkins shows science minister Peter McGauran some biodegradable chocolate trays.*

The CRC has 28 per cent equity in Plantic, and CSIRO has a share of that. A quarter of Plantic's initial funding will be reinvested into R&D, and CSIRO has a share of royalties on overseas sales.

Dry-biscuit packaging is a niche market worth $300 million a year alone.

Plantic is capitalising on a strong worldwide trend towards biodegradable packaging.

Many European countries, for instance, impose taxes and charges on plastic packaging. In Japan, incineration of plastic products has been linked to cancer rates. High-density living in Japan means landfill is not a disposal option.

Dr Christie said: "This is a cost-effective alternative to traditional petrochemical products."

The corn plant used to make the product acts as a carbon sink by capturing up to 9 per cent of its weight as lignin that is held in and upgrades the soil. A further component of the plant is processed into plastic. This is composted after use back to carbon dioxide that is ready to be cycled back into the corn plant that is regrown.

Dr Christie said: "The energy required to drive this recycle loop is all provided by nature. "Traditional plastic recycling uses a lot of energy.

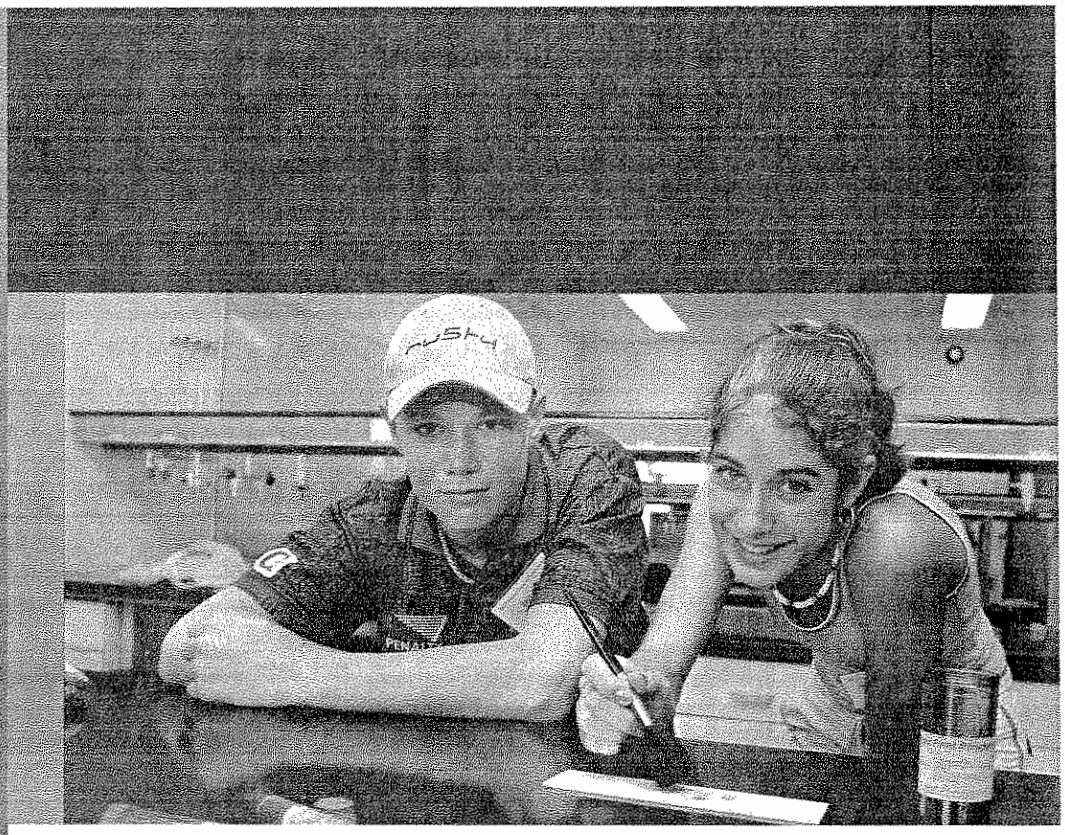
"And, from a greenhouse point of view, you're pushing the carbon the wrong way, into the atmosphere.

"Landfill is becoming a less attractive option."

Dr Christie takes the view that this project has been a success for science.

"It shows that science is not just being totally reactive in making existing things cheaper. It can deliver new, better and environmentally in sync products."

Plantic is seeking investors, and looks like attracting mainly Australian investors. ■



In print: Dylan Hetherington of Moura and Samantha Bennington of Mackay took fingerprints at the summer school. PHOTO: The Morning Bulletin

Workshops for children with guts

Dissecting pig guts and examining cow-gut fluid were highlights of this year's Siemens Science Experience at CSIRO's J M Rendel Laboratory in Rockhampton.

About 60 Year 10 students from throughout Central Queensland took part in the two-day program of workshops. Many of the students were billeted in Rockhampton by Rotary families.

Livestock Industries' Ms Jo Miller said: "It was good to see the students really getting involved and interested."

Disko party in Greenland

A score of teenaged Victorian students and four teachers headed off to a place called Disko Island in Greenland with suitcases full of thermal underwear in January.

The party will make up this year's Victorian Government school Arctic expedition.

CSIRO Atmospheric Research (CAR) equipped the expedition with scientific equipment and will analyse samples and readings from the expedition.

CAR's Mr Paul Holper said: "They have gone to the Arctic Circle to experience life there, to look at a different culture and to do a few scientific experiments."

The Year 12 students will be based at the University of Copenhagen's Arctic Station.

They will fill CSIRO flasks with air samples and take meterological readings.

"It will give them a comparison between the purity of air in the Northern and Southern Hemispheres," Mr Holper said.

The 10 students from last year's inaugural expedition co-authored a scientific paper with CSIRO scientists.

This year's students visited the Atmospheric Research division in December for a one-day training program and a barbecue lunch.

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Editorial Manager: Rebecca Scott
Editorial Assistant: Karen Robinson
Editor and writer: Megan Bird, Hippity Hop Journalism
Designer: Swell Design Group
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Readers are encouraged to contribute or offer story ideas. The deadline for contributions to the next edition is Wednesday, May 1.

Send contributions to CSIRO Internal Communication
PO Box 225 Dickson ACT 2602
Phone: **02 6276 6639**
Fax: 02 6276 6273
Email: internalcomm@csiro.au
hrho@optusnet.com.au (to contact Megan Bird) or
Karen.Robinson@csiro.au

Contact Karen Robinson to add or delete your name to the CoResearch mailing list.

Coal crusaders tackle sticky problem

BY MEGAN BIRD

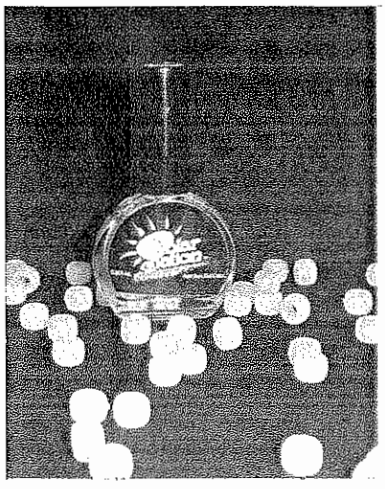
Sticky coal, jackhammers and chaotic train timetables are ingredients of this small drama.

The heroes of the story are four strapping scientists from CSIRO's Exploration and Mining (CEM) and Energy Technology.
The set is the end of the line for Queensland coal, near Gladstone and Mackay, where our heroes have been solving the problem.
Coal, believe it or not, can be sticky. This presents a logistical nightmare when coal wagons pull up to be unloaded and the coal refuses to budge.
Tightly scheduled trains are disrupted.
The solution, until now, has been to call in some beefy jackhammer operators, who hammer, sometimes for hours, to entice the coal to port.
It's noisy and costly.
CEM's Mr Graham O'Brien said: "It's quite an expensive and time-consuming problem."
The coal sticks, apparently, because of its size distribution or fineness, moisture and, when unwashed, the presence of fine clay.
This problem can be aggravated by the forces imparted to the coal during loading and on its journey to port, and the design of coal wagons, especially those of an older vintage.
Queensland coal exports are worth about $8 billion a year to the Australian economy.
Enter our heroes.
This problem has been significant enough to attract $200,000 from the Australian Coal Association Research Program. Coal port and mines have added assistance.
Queensland Rail came to the party by offering a guarantee that a solution that provided improvement in productivity be returned to the industry in reduced rail freight.
If this translated to a mere one-cent-a-tonne reduction, coal freighters would be handed at least $1 million a year in savings.
Our four heroes – ably assisted by Queensland Rail, the mines and ports – have been working on solutions for 18 months and are on the brink of finding them.
Loading the coal is one key, they have discovered. The geometry of coal wagons is another. And the position that jackhammers are applied and the frequency that they operate could be tweaked to give better energy penetration and less need for jackhammering.
The data is in, and the analysis is underway. ■

Christmas sparkle

BY MEGAN BIRD

"**Xmas Xtras:** CSIRO flogging ultraviolet nail polish online! Has the commercialisation of Aussie science come to this? Sir Ian Clunies Ross would be reaching for a Rothmans. Ian who? Anyway, what the hey, it's the 21st century and people still give tacky presents to mark the summer solstice. Howsabout touchable bubbles that last for hours, a night sky guide, and ant farm or a stegosaurus embedded in a lump of plaster? Order before tomorrow to expect delivery by the 24th. www.csiroshop.com" - **The Canberra Times, December 13**



This newspaper item embodies some journalists' reactions to CSIRO's new online e-shop.
Surprise, mild disapproval and amused resignation.
CSIRO is an organisation that has been variously referred to by these same scribes over the years as "crusty", "conservative" and "full of boffins".
It's not the sort of austere place, it seems, that most Australians would shop at to fill up their children's Christmas sacks.
The staff at Double Helix were delighted then when the orders began rolling in.
Elfin effort was utilised at the merchandise warehouse to deliver orders on time for Saint Nick, and special helpers were conscripted at Double Helix to cope with the extra enquiries.
The online shop went live in the last week of November, but generated only 13 customers that month.
Thanks to the added publicity that stunned hacks provided in mid-December nearly 200 shoppers bought stocking fillers online before Christmas, and CSIRO sold out of a couple of items.
Merchandising officer Jana Kukla said: "We went online to get more exposure and broaden our reach."
CSIRO has been selling children's merchandise with a scientific bent for about five years.
It sources items mainly from Australian toy suppliers. The ultra-violet nail polish and beads are imported from the United States, and the PET bottle rocket launcher is from England. ■

Champion for women

Plant Industry's Dr Liz Dennis is one of only 27 female members of the prestigious Australia-wide Honouring Women initiative.

Liz agreed to become a founding ambassador in the initiative on Australia Day last year.

"The network's main aim is to get more recognition in the form of honours for women," she said. "There are so few women in the higher echelons of professions."

Liz has become convinced that awards do have a role to play.

"I was sceptical, but I have since seen what a difference recognition in the form of awards makes to women's lives and self-esteem," she said.

The network's role is to scout for women who are suitable award recipients, encourage others to nominate them and advise on applications.

"If any of your readers have any good ideas please ask them to send them through," she said.

"The initiative is also a bit of a network for more senior women to talk to each other," she said.

One highlight for Liz was a networking function of ambassadors where she had the opportunity to rub shoulders with the likes of former politician Dame Margaret Guilfoyle and former Victorian Premier Joan Kirner.

"They are all committed to the recognition of women," she said.

Liz jointly won the inaugural Prime Minister's Prize for science two years ago. Her own career motivation was idealistic.

"I wanted to become a scientist when I was a kid because I wanted to save the world," she said.

Despite being unsuccessful in this aim she said: "The pure excitement of finding out new things has kept me going."

Liz puts her success in her profession largely down to luck.

"It's been an exciting time for molecular biology," she said.

"I've had a lot of support from CSIRO and the scientific community and I think I've been lucky to be in the right place, at the right time."

Liz, a scientist for 25 years, feels she has a responsibility to young women scientists.

"Just being a woman in a position of responsibility makes me feel strongly that I have an obligation to encourage young women," she said:

Women are well represented in her own laboratory.

"But this is not at the expense of men," she said. "We also have men here too who are very good."

Action on staff poll

Human Resources staff are working frantically around the country to make sense of last year's Insight staff poll and to implement improvements. BY MEGAN BIRD

Ms Debbie Carruthers, from Minerals, has helped devise an in-depth strategy. Her enthusiasm has some historical significance.

Debbie joined CSIRO six months after the last staff poll and noticed that, while change was made, more could have been done to make staff aware of it.

"It's important we let all staff know what has been done in direct response to their feedback," she said.

Minerals performed equal to or better than the CSIRO average in 15 out of the 19 categories.

The weakest areas were working relationships, job security/organisational stability and pay – the only statistically significant one.

The strongest areas were working environment and information dissemination.

Debbie says instead of using focus groups all work groups will participate in identifying action items.

Staff are being asked why they answered as they did on low-performing areas, to make suggestions of possible solutions and, on a local level, determine who would have the responsibility for implementing change and by when.

Site visits, staff briefings and discussions on the data and management meetings are also underway.

A divisional action plan will result by the end of March.

"We're actually tackling a lot more than what was suggested," Debbie said.

CSIRO Mathematical and Information Sciences (CMIS) is taking a different approach.

With divisional staff scattered over seven cities one of its biggest challenges is to inform everyone of what is happening.

CMIS has circulated results and given all staff the opportunity to attend on-site staff meetings.

Its weakest areas were working relationships, pay, leadership and aspects of scientific reputation.

Weaker results for pay were no surprise.

A lot of CMIS staff are IT specialists.

Mr Trevor Heldt said: "Other surveys have told us that people are here because they enjoy the work."

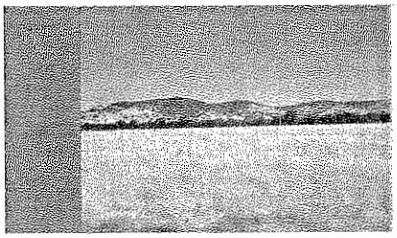
Encouragingly, no categories rated below the CSIRO average.

Information dissemination, organisational change and training were better than average.

"We have put a lot of time and effort into training and development," Mr Heldt said.

The leadership issue will begin to be addressed at an upcoming three-day meeting of middle and senior managers.

Extensive site visits have taken place. The next step is to gather more information via focus groups and devise action plans.

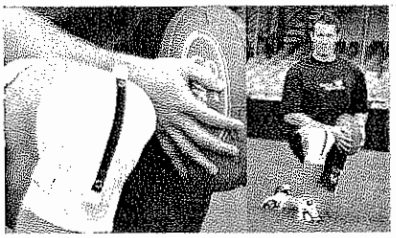


Victorian scene: *The workshop in country Benalla will mark the start of the project.*

Underground collaboration

Four CSIRO divisions are collaborating in a project that proposes to slice across Victoria to provide the most detailed geological information of a section of Australia.

The Victoria Undercover project would provide valuable information on salinity and the potential for mineral exploration and agriculture.
Exploration and Mining's (CEM) Professor Neil Phillips said: "There are some nagging national issues that can't be solved by scientists from one discipline alone.
"This project would bring a lot of parties together to give us much better answers."
Victoria Undercover would build on the work of three major CSIRO research projects: Heartland, which is addressing land-surface problems; Glass Earth, which is looking at the top kilometre of Australia's crust; and Victorian Geo Traverse, which is advancing geological data.
Professor Phillips said: "A large part of why we've got salinity and bad water is deeper down."
Scientists were addressing salinity as a two-dimensional problem, he said.
"The third dimension is underground and the fourth dimension is time."
The five-year project proposes to slice across the southern part of the Murray-Darling Basin and the Great Dividing Range.
The multi-million-dollar project and potential funding sources will be discussed at a three-day conference in Benalla, Victoria, from April 30 to May 2.
Scientists from CEM, Forestry and Forest Products, Land and Water, and Sustainable Ecosystems will present conference papers along with scientists from two CRCs and about six universities.
Participants will take a one-day field trip and hold free evening talks for the communities of Benalla and nearby Euroa.
"In some ways this is CSIRO and the scientific community reaching out to the community," Professor Phillips said.



Test run: *The Geelong Football team's Brenton Sanderson tries out the knee sleeve.*

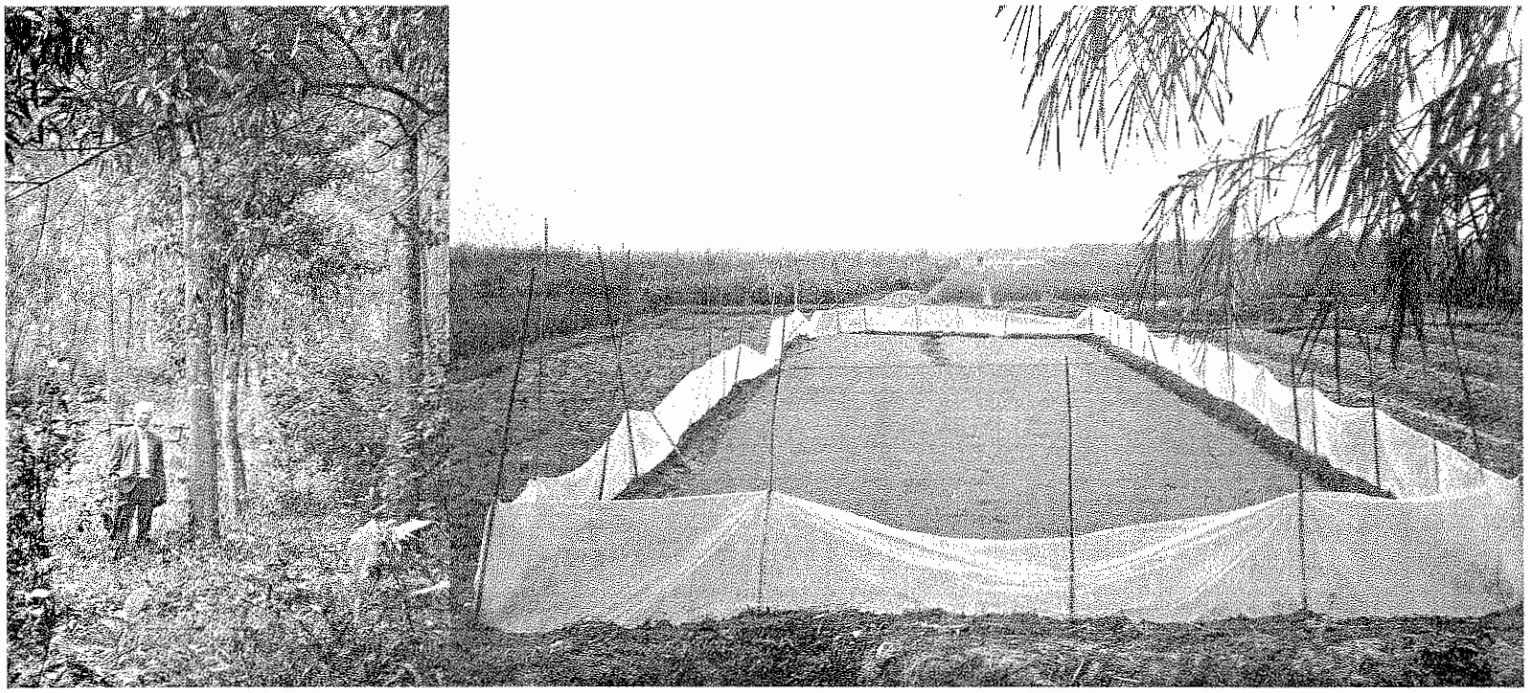
Geelong sews up intelligent textiles

A knee sleeve that has been teaching the Geelong Football team how to avoid knee, ankle and lower-limb injuries has given the AFL team an edge.

A knee sleeve that has been teaching the Geelong Football team how to avoid knee, ankle and lower-limb injuries has given the AFL team an edge.
Textile and Fibre Technology's (CTFT) Dr Barry Holcombe said: "There has been clear evidence of a performance improvement.
"I think it was an eye-opener for everyone involved."
The players have been testing the sleeve at pre-season training. It is now undergoing a clinical trial at the University of Wollongong.
The sleeve is coated with electronic polymers. Sensors detect the angle at which the knee is bent and beep when the best angle is reached.
The guard was developed by CTFT, the Intelligent Polymer Research Institute (IPRI) and the Biomechanics Research Laboratory at the University of Woolongong.
Dr Holcombe said: "They knew AFL had a major issue with anterior cruciate ligament injuries and was interested in R&D."
The Geelong Football team put the sleeve through its paces and gave it full marks.
Coincidentally, team medical officer Hugh Seward a newly converted fan of the technology, is also the AFL's medical officer.
IPRI has signed a strategic alliance with CTFT in Geelong to develop the necessary intelligent textiles.
This application was one of scores that were discussed in February at an Electronic Textiles workshop in Geelong.
Dr Holcombe said: "We are on the verge of a textiles revolution. Our clothes are set to become active participants in our lives and activities, warning us when we are becoming stressed or sick, actively protecting us from the weather."
Applications could include car seats that wake up drowsy drivers, sheets that monitor your health and socks that let you know when you are about to tear a tendon."
Until now, fabrics could only be made conductive by weaving in carbon or stainless steel fibres or with special surface treatments.
New plastics that are natural conductors have been developed.
Fabrics containing the electronic circuits can be handled like traditional cloth, crumpled, ironed and washed.
Sporting applications could lead the way, thanks to the research dollars sport is able to invest.
Suits with plastic sensors could help golfers, for instance, according to Dr Holcombe.
"When everything is in the right position to hit the ball - limbs, wrists, neck and head - there would be an audible tone," he said.
"It doesn't take much to think up 100 possible applications."
CTFT is closely guarding its intelligent-textile secrets.
"Not a lot of work is being done in this area," Dr Holcombe said.
"We are at the forefront."

Making our mark in Viet Nam

Nick Goldie from CSIRO Media visited Viet Nam, as the locals spell it, in January to view a number of joint research projects in which CSIRO has a role. The local delicacy of rat, Vietnamese hospitality and the Australian trees that proliferate in otherwise traditional scenes surprised him.



Crop protection: *An early crop flourishes inside a rat barrier (right).*
Mastering the movement: *Professor Kha, a master of acacia hybridisation, walks on Ba Vi mountain (above).*

The Australian eye in Viet Nam is constantly being taken by unexpected conjunctions: a paddy of rice, lined by tall straight eucalypts; a buffalo in a pen, being fed fronds of wattle by a small boy; a cassava plot against a background of Australian acacias; forestry workers in amongst the gum trees, wearing conical hats.

Gums

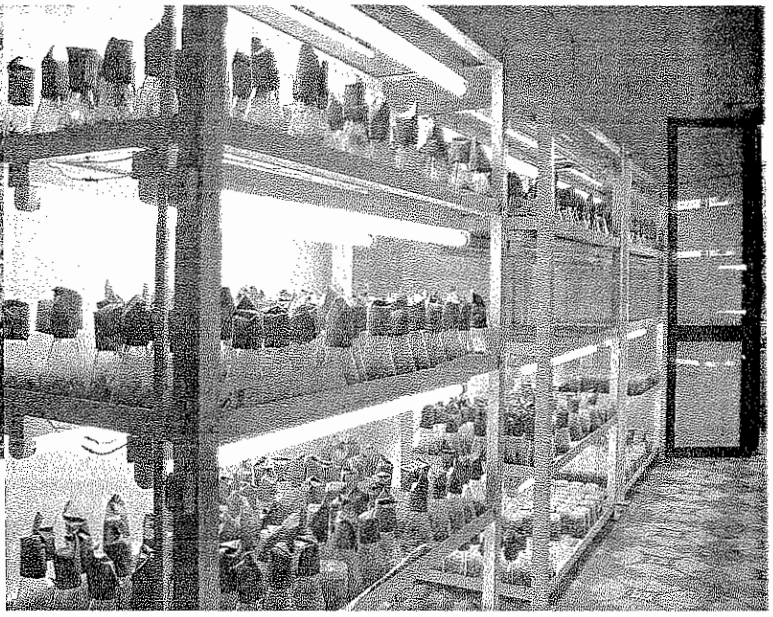
After what the Vietnamese call "the American War" the countryside was defoliated, cratered, and devastated.

Forestry is part of the national program of rehabilitation, and Australian trees are there in huge numbers, in formal plantations and casually around homes and farms. Much of this is the result of the work of CSIRO's Australian Tree Seed Centre.

Professor Le Dinh Kha of the Forest Science Institute of Vietnam is ecstatic with the results of his acacia hybridisation program, and with good reason. The forests on Ba Vi Mountain, where the centre has 250 hectares of trial plots, are like a scene from The Lord Of The Rings: green, shady avenues of perfect trees with straight trunks, undamaged foliage, graceful shapes.

Redgum has become especially popular among farmers. In Vietnam redgums grow tall, straight, and elegant - and very quickly.

Vietnamese forestry is facing a very immediate challenge. The country has a population of some 80 million, projected to double in the next century. Every square metre of land will be pressed into use, and the demand for forest products and



Photos: Dylan MacLeod

New growth: *Workers propagate Australian trees at the Ba Vi forestry centre (above).*
Shelf life: *Australian Species are propagated at the Forest Science Institute of Viet Nam in Hanoi (right).*

ecosystem services like clean air, clean water and erosion control will become enormous.

Rats

"In the old days," says Le Thanh Hoa of the National Institute of Plant Protection, "the farmer grew a little bit of extra rice for the rats, and some for the birds." Nowadays, times are harder, and farmers can't afford freeloaders. At the same time, intensive agriculture has encouraged a population explosion in the rice-field rat (Rattus argentiventer). As in Australia, farmers are inclined to reach for the nearest chemical solution, but with CSIRO assistance an ingenious rat-barrier system has been developed.
First a small area is chosen and enclosed with a low plastic barrier, sometimes a moat. There are rat-sized holes in the barrier, leading to rat cages. Inside the barrier, an early crop is planted: rice in the south, a market garden crop in the north (north Vietnamese rats are particularly fond of chilli, says Mr Hoa).
Rats come from all around to harvest the early crop and are, instead, harvested themselves. At the same time, a more-or-less rat-free zone is created outside the barrier where the main crop can be planted.

The full story: *Nick Goldie interviews Le Thanh Hoa in Hanoi.*

The barrier system depends on cooperation between the villagers, and on good science. Researchers have found that the rat reproductive cycle is neatly attuned to the ripening of the rice crop, so that early sowing inside the barrier can stimulate a whole generation of rats. Catching one rat early is equivalent to catching 50 rats later, they say.
What happens to the rats that have been caught? It is worth remembering that villagers may have a very low protein intake, and they waste nothing. There was brisk debate when I asked a meeting of farmers in the Mekong delta which is the best way to cook a rat.
Apparently (like a tomato) the skin comes off easily after the rat has been dipped in boiling water ... and then it's a matter of chilli and garlic and a dash of nuoc mam. And if you don't feel up to a bowl of rat, the farmers explained, you can always take them to market where a kilo of live rat can earn 15,000 dong (one US dollar) – good money for a pest.

All at sea

Tourism brings in dollars, but it can also bring problems.
Nha Trang is a small coastal city in central Viet Nam which is attracting tourists from around the world. As you loll on the beach, there's a distant booming as dynamiters attack the coral reefs for tourist souvenirs. Local fisheries are depleted, and even the small brilliant reef fish are being taken for the international aquarium trade.
Fishermen use cyanide to stun their prey, which are captured and revived, but the cyanide is having devastating effects on the reef biodiversity.
As well as tourism, Nha Trang has Viet Nam's Institute of Oceanography, and the University of Fisheries, with 10,000 specialist students.
I visited Nha Trang to meet Le Anh Tuan, who has worked with CSIRO's Kevin Williams in Cleveland, Queensland. The plan was to view the joint CSIRO-University aquaculture project, but I hadn't reckoned with Vietnamese hospitality.
A riotous party of oceanographers and fisheries scientists resulted in a day at sea, on a wonderful wooden boat visiting the islands to be included in the Hon Mun Marine Park.
The marine park plan is closely modelled on the Great Barrier Reef Marine Park.
Nha Trang's coral reefs are to be protected, aquaculture will supplement the traditional fisheries, and the tourist dollar will be managed for the whole community.

Seminars and little sandwiches

The Big Day Out, for those of you who are kept in very dark offices, is an annual event for summer vacation students.

The students, from various CSIRO Mathematical and Information Sciences' (CMIS) sites, got together in Canberra in February for two days of seminars and little sandwiches. They presented their work and heard career anecdotes from CMIS scientists.

ABC Science Online's Bernie Hobbs set the tone of two panel sessions that revolved around the theme, So you want to be a scientist?

Dr David Hawking stole the show.

David, it seems, worked for drug dealers, in a mental hospital and in snake-infested bulrushes for pocket money during his university holidays as an undergraduate student.

"I worked on various orchards, for a brewery and then for a syndicate of drug dealers, picking tobacco. After a week of backbreaking, unpleasant, smelly work, I was the only employee still on the payroll," he said.

"I worked for the Beechworth Shire Council as a surveyor's assistant, tramping through snake-infested bulrushes while the surveyor took readings on his theodolite, from a shady section of road.

"Next I became a trainee psychiatric nurse in what you might call the terminal ward of the Mayday Hills mental hospital."

And what did he learn?

From the council: "Hard work can be fun," he lectured. "If you think this already you have passed the first test of a successful researcher."

From the drug dealers: "Money can be a useful substitute when hard work isn't fun."

From the surveyor: "If you have superior qualifications you can stand in the shade."

From the mental hospital: "It's good to entertain creative and lateral ideas as long as you test them thoroughly before accepting them as reality."

The vacation students worked in more stable environments on projects that delved into areas ranging from bursting water pipes to delivering video over wireless devices.

All of them seemed to agree that hard work can be fun.

- Andrea Mettenmeyer, CMIS

The remarkable tale of a well-travelled cat

Planes, ferries, high-speed trains and automobiles. This pampered feline has seen them all. BY **MEGAN BIRD**

She has two passports and has travelled thousands of kilometres, most recently from Bordeaux, France, to Australia, at a cost to her owners of about $10,000.

Puddy's doting owners are Forestry and Forest Product's Dr Stephen Langrell and his wife, Juliet.

Juliet rescued Puddy as a kitten a decade ago, Edith Piaf style, from the gutters of the Parisian Chinese district of Belleville.

Stephen said: "The standing joke is she was rescued from being sweet and sour.

"She was an abandoned mess," he said. "She was starving, riddled with fleas, diarrhoea, you name it."

Stephen met Juliet about a year later, while he was working as a scientist at the University of Paris.

Puddy tried to break the couple up.

"It was terrible. The cat didn't like me at all," Stephen said.

Puddy went from ignoring Stephen to trying to push him away from Juliet when the couple sat together.

Stephen is better tolerated these days.

Puddy was mistress of a sixth-floor flat in central Paris. The Langrells left a window open so she could roam the rooftops and chimney pots.

But she was forced to abandon her rooftop paradise about five years ago when Stephen got a job at a London university.

Puddy was quarantined in Britain for six months, at a cost to the Langrells of more than $3,000.

Stephen and Juliet visited her every weekend and, when Puddy was finally released, she purred non-stop for two days.

Puddy's Australian quarantine was less traumatic. She spent the minimum, 30 days, behind bars.

What surprised the Langrells about the process were the extraordinary checks and balances Australian quarantine required.

Puddy had already been microchipped and had a wad of vaccination documents, but needed more.

Stephen said: "And this was all done despite the fact that this cat hates vets.

"She has destroyed vet surgeries up and down Western Europe."

Her fear of men and women in white coats is so intense the Langrells use sophisticated ploys when she needs treatment.

"Vets make home visits. They hide in another room, prepare syringes and run in and inject her."

The lengths the Langrells will go to for their cat are surprising their Australian friends, Stephen said.

"But Puddy's definitely worth it.

Puddy remains typically Parisian, according to Stephen, despite having lived in three countries.

"She's a Miss Madame," he said, "very fussy about what she eats, who she likes, has a distinctive routine and doesn't like going outside."

She eats, by the way, only one brand of cat food or her favourite, pizza.

There is one more twist to this tale. It seems the word is out, and the Langrells have developed a cat-lover reputation amongst Australian felines.

They have only lived in Australia since October, but encountered their first cat refugee early this year when a neighbour presented them with a paralysed cat.

This young cat, whom they named Eddy after Dame Edna Everage, mistook the neighbour's house for the Langrell's.

Eddy had braved traffic, and been hit by a car to get there.

He discovered his mistake when two barking dogs appeared in the neighbour's yard. Eddy ran up a palm tree and was found there, dehydrated, on the brink of death and paralysed, perhaps in shock at his own lack of direction.

"Why it dragged itself across a yard with two dogs and into the neighbour's palm tree remains a mystery," Stephen said.

"He's a young cat, I guess, and a bit of a dumb one."

The Langrells took Eddy to the vet, where he was given little chance of survival.

The only reason they did not practice euthanasia on Eddy was because his owner was unknown.

Eddy hung on while the Langrells searched for his owner, and eventually returned to full health.

When I spoke to Stephen in February, Eddy had been missing for a week.

"We think he might have returned to his owner," he said.

But the Langrells are still burning a candle for him. They bought Eddy a collar and attached their phone number and address to it.

The big O

The news of a stud oyster, bred by Tasmanian scientists, had them licking their lips across the strait in Melbourne. Scientists from CSIRO Marine Research and the Tasmanian Aquaculture and Fisheries Research Institute began breeding the oysters seven years ago.

A new company, Australian Seafood Industries, has been established by the Tasmanian and South Australian oyster research councils, the South Australian Oyster Research Council and the South Australian Growers' Association. The company's mission is to introduce the new oyster lines to commercial hatcheries and growers. One inspired old salt writing for the BackPage of The Age had this to say about a stud oyster's sex life.

Where would we be without those clever folk at CSIRO? We ponder this question this morning as we read of the "stud oyster" - the fourth generation of a selective-breeding program designed to grow Pacific oysters faster. This mighty mollusc is adding to the production rate in five sea farms around Tasmania and South Australia. BackPage's maritime correspondent, Kilpatrick deMornay, clambered over many rocks to secure this world exclusive interview with one of our leading studs, fresh from his oyster bed.

BackPage: What's your real name?

Stud Oyster: Crassostrea gigas - but my friends just call me S.O.

BP: How did you get to be a stud oyster?

SO: Not everyone can do what I do. Let me tell you. It's bloody tiring, and you never receive as much as a thank you: it's all 'whirl, hurl, thank you Pearl.' They can't get enough of it, you know.

BP: Yes, but what sort of training do you undergo?

SO: It's very intensive. First, you have to pass a physical, where a medical board looks at your equipment, does a bit of prodding and poking and squirting with lemon juice to judge the shrivel factor (some of those scientists like to linger over the soft bits) and determines your capabilities. Then, if you make the grade, you're auditioned by FOCKO - that's the Female Organising Committee for Knocking Oysters - and, let me tell you, my friend, very few of us pass that one.

BP: Why?

SO: Put it this way: you have to keep at it for a week, going from rock to rock, shell to shell, with no time to think about what you're doing. AND you have to remember each oyster's name, in case you come round again. Meryl and Lillian are identical twins and I nearly came unstuck there ...

BP: Do you form any attachments?

SO: I leave that to the limpets.

BP: What about language skills?

SO: My French isn't bad, and you should see some of those beautiful Belon Flats: they'd knock the enamel off your teeth ...

BP: ... and the pearl out of your shell?

SO: Yeah. Got the picture?

BP: I think so. Speaking of pearls, do they ever ... er ... intrude?

SO: We got over them, but all the fuss about them just isn't worth it.

BP: What have you been reading?

SO: The Shipping News and Oyster, by Janette Turner Hospital, which wasn't quite what I was expecting.

BP: So how many oysters have you made love to?

SO: Oh, 59 million or so. It's been a slack week because of the holidays. By the way, we prefer not to say "made love"; it's purely professional between us molluscs. I usually like to handle them by the dozen on the half-shell.

BP: How do remember your children's birthdays?

SO: Not easily. There are about 45,000 every day. I just send cards when there's an "R" in the month.

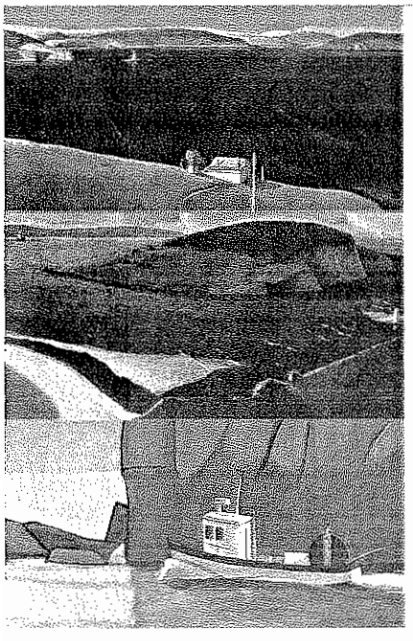
BP: What do you do in your spare time?

SO: I get the occasional day off. Usually, I play a bit of tennis or get together with a few of the fellas for a clambake at the Crustacea Club. Or, in those quieter times, I retreat into my shell. Otherwise, it's all go.

BP: For someone who spends a lot of time making l... er, engaged in professional activity, you seem remarkably well adjusted.

SO: Well, you should see me at the end of a shift. I'm absolutely shucked.

- *Reprinted courtesy of Victoria Gurvich and The Age*



Castaway painter

No man is an island, but Marine Research's Jock Young just can't stop surrounding himself with his paintings of watery landscapes.

Sydney-born Jock moved to the Apple Isle 17 years ago and has a stunning view of the Derwent River from his rented studio at Battery Point.

"I find that having this other life is more of a help than a hindrance," he said.

"It's just the thing I do when I'm not working.

"It's a bit of a passion really. We all have our thing."

Jock's job as a swordfish biologist often takes him into the field to dramatic locations that inspire him to paint.

He has noticed similarities in the disciplines of his science and his art.

"It's the same sort of observation perspective, but painting allows me much more freedom," he said.

Jock tried being a scientific illustrator but confesses: "I was really bad at it."

Jock is much more skilled as a creative artist, and has established a sound reputation as one.

He has been painting for the last 30 years, and exhibited in Tasmania and on the mainland for the last 15. His has sold hundreds of paintings to individuals and organisations, including the National Gallery of Australia, the National Australia Bank Collection and individuals in three continents.

Two of his paintings hang in Marine Research headquarters. The division also commissioned him to paint the scene for its 2000 Christmas card.

"They have been very supportive," he said.

His father, who encouraged Jock to swim and sail with him, fostered his love of the water.

"It was part of growing up and I've never stopped really."

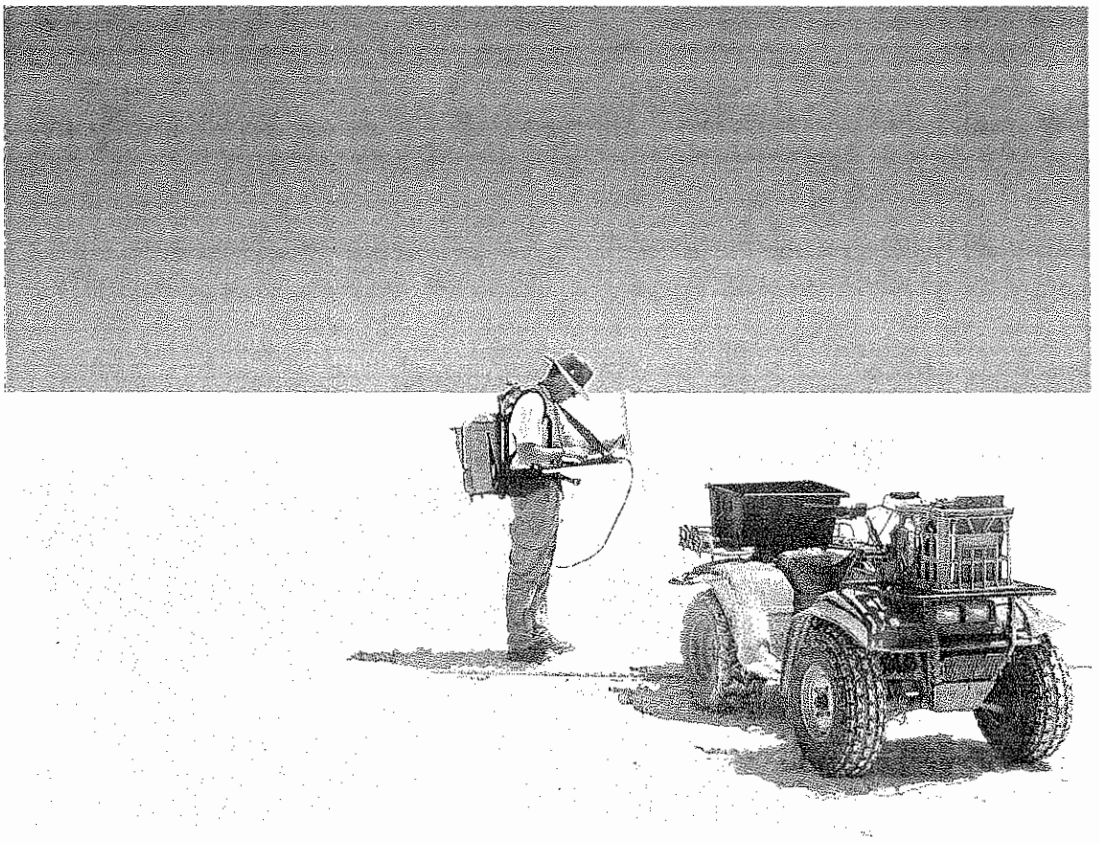
Photo finish

The standard and quantity of entries in the recent Snapshot photo competition overwhelmed judges. They received 99 entries from staff, and shortlisted 41 of them. Finalists' photographs will be exhibited at Discovery in Canberra from April 12 to May 17.

First prize and $1,000 of photographic equipment goes to Atmospheric Research's Susan Campbell.

Judges had a devil of a time choosing a runner-up so awarded it jointly to Bernie Muldowney from Minerals for his hellish portrait, and Martin Dillon from Entomology for his sportsmanship. Bernie and Martin will receive $250 worth of equipment.

Three bronze medallists, Russ Bolton from the Australian Telescope National Facility, Jock Churchman from Land and Water, and Anthony Whitbread from Sustainable Ecosystems won $100 worth of gear.



Susan Campbell, Atmospheric Research, ANU, Acton

"A colleague, Guy Byrne, prepares to take spectral measurements of the salty surface on Lake Frome, in late December, 2000, during the EO-1 Hyperion calibration mission. It was extremely hot, around 50°C, the sun was almost directly overhead, the surface was reflecting about 70 per cent of the incoming solar radiation, we have the data to prove it. And yet it was a truly exhilarating experience. At this point, we were at least 30km from the lake's edge and many more from safety, surrounded by blindingly white salt, surf-like mirages and the odd floating island, but Guy calmly goes about his business."

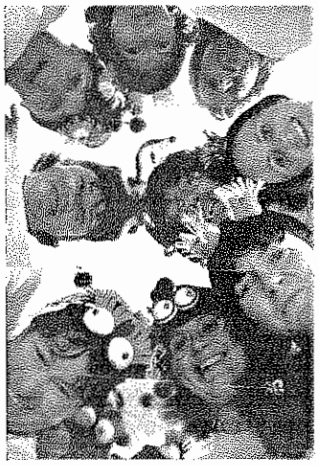
snap:shot

Anthony Whitbread, Sustainable Ecosystems, Toowoomba

"CSIRO Sustainable Ecosystems and the Australian Centre for International Agriculture Research are working with small-holder communal farmers in the resettled areas of Wedza in Zimbabwe, Southern Africa. The aim of the project is to improve forage, animal and crop production through the integration of well-adapted legumes into local farming systems. This requires the support and involvement of the local community. The three local village chiefs pictured are attending a recently held field day that promoted the project findings."

Bernie Muldowney, Minerals, Clayton

"We go through hell to succeed at Minerals."



Martin Dillon, Entomology, Myall Vale

"We're based at the Australian Cotton Research Institute near Narrabri. Our site has a mix of CSIRO Entomology, CSIRO Plant Industry and NSW Agriculture staff. One enjoyable part of our jobs is the annual sport and social day. This collage captures the Grotty Grubs 2001 team from the insectary. We might have come second-last on the day, but we left a lasting impression with the regulars at the Narrabri Bowling Club. Clockwise from bottom left: Trudy Staines, Tracey Parker, Karen Stanford, Debbie Richardson, Judy Nobilo, Jenny Chapman, Dr Mary Whitehouse, Dr Sarah Mansfield and Martin Dillon (centre)."

Russ Bolton, Australian Telescope National Facility, Marsfield

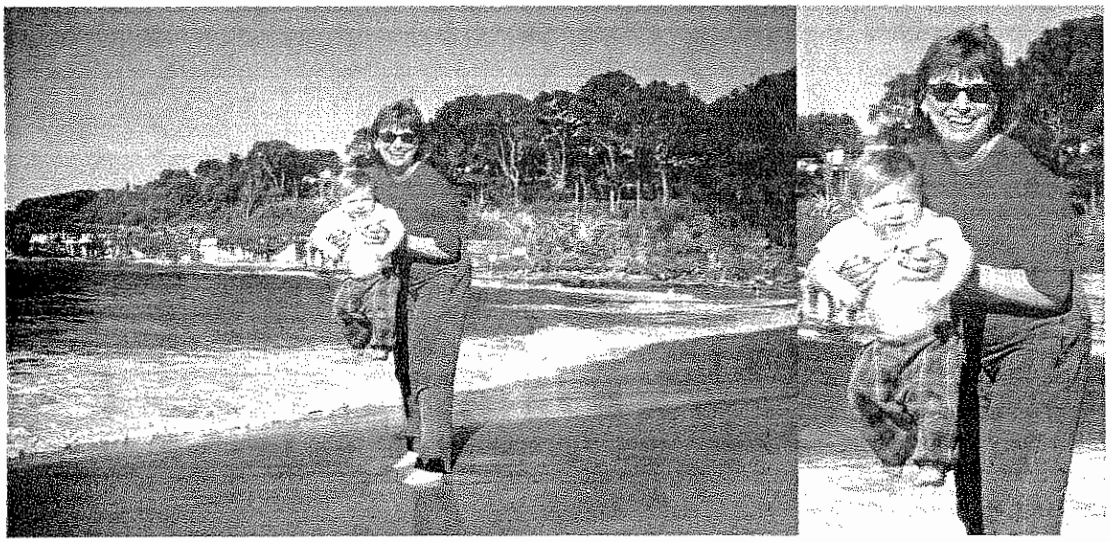
"Great people. Great science. Senior Technicians carefully assemble advanced receiver units for the Australia Telescope National Facility at Narrabri. Hand-building the cryogenic copper work and installing the ground-breaking MMIC low-noise amplifiers, gave us all a unique experience. Daron Brooke works with the Epping team members Les Reilly (left) and Henry Kanoniuk to expedite the receiver front ends closure by June 2001. Our schedule was met and the results were successful. It became the first 3mm and 12mm array using InP MMIC technology in the southern sky."

Jock Churchman, Land and Water

"I took photograph of my colleague, Dr Rob Fitzpatrick, when a group from our division, Land and Water, visited the MCG in Melbourne to advise the groundsman on possible soil problems relating to an uneven bounce experienced during the previous cricket season. This was taken during the football season. It was interesting and exciting to think that our skills and knowledge of soils and clays could be applied to improve the playability of such a high-profile venue. It was also exciting to be three of only four people, the other was the groundsman, in the vast cauldron of the MCG."

Poetry, by George

Bev George had achieved two life ambitions when she retired from her position as a writer and editor at Food Science Australia last year. BY **MEGAN BIRD**



Currawongs herald
the tap-dance
of new rain.

- From Bev's book of haiku, 2000

Back Street Observation
Sloe-eyed cat
back-curling paws high lifted
picks through urban debris
sniffs daintily at fish head
and putrescent prawns;
slicks stiff, uneven whiskers
wipes clean her black glossed fur
and steps out into darkness,
aura undisturbed.

- From Visible In Ink, 2001

Beach buddies: *Bev George has more time since retiring to spend with her grandson, Aidan, at her Pearl Beach home.*

"I'd always wanted to be a fulltime writer and editor, and I'd always wanted to work for CSIRO," she said. "CSIRO is such a diverse and fascinating organisation and provides so many opportunities to interact with interesting people. I love the size and scope of it; the struggles and the enthusiasm."

Bev has also written creatively since 1995.

Her first published short story appeared in the Weekend Australian. She has since had many stories and poems published and has enjoyed considerable success in literary competitions.

She has written a book of haiku and one of general poetry and is a Writing Fellow of the Fellowship of Australian Writers NSW Inc.

Her books are illustrated by photographs she has taken herself, thanks to a previous career as a professional photographer.

When I spoke to her before her retirement last year she had just agreed to assume responsibility for Yellow Moon, a literary magazine of haiku and other poetry that had been running for four years.

I contacted her recently to check on progress, and caught her going through her mail.

"Mail for the magazine comes in every day from all states of Australia and beyond," she said. Under Bev, subscriptions to the magazine have more than quadrupled.

"The magazine has made the transition to retirement so much easier in that I have retained the level of interest and interaction I enjoyed in the paid workforce," she said.

One of the 12 categories of poetry the magazine publishes is haiku. Bev speaks about special "haiku moments" she experiences at her Pearl Beach home near Sydney, watching the ocean, rain or the lagoon.

Haiku is written in the present tense. It records what is happening, and requires that the author not intrude into the poem by making personal comments.

I suggest to her that, in its objective observation of nature, haiku is not unlike science.

"I think so," she replies. "People say, 'What a difference, from writing about science to writing haiku'. But haiku are accurate observations, perceived from an original or interesting perspective. Not unlike science at all.

"Haiku is a universal form of verse bestowed by the Japanese, which knows no religious or political parameters. Haiku are observations of nature and do not employ the traditional devices of western poetry such as alliteration, metaphor, simile or rhyme."

Haiku traditionally use a maximum of 17 syllables but modern haiku written in English often use fewer syllables to best approximate Japanese with its shorter sounds.

As well as haiku and haiku-related verse the magazine publishes the best entries from its various competitions in traditional poetry like sonnets, odes, humorous and nature poetry and terse verse such as limericks, cinquains and tetractys.

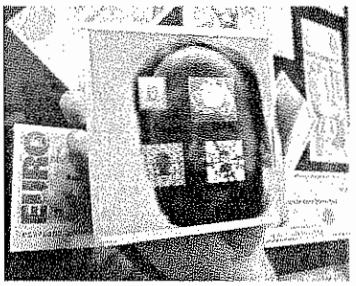
Competition entries come from all over the world, but particularly from the United States, New Zealand and Croatia.

Bev believes the secret to retirement is not to wait until then to begin the things you're going to do in retirement.

"That way you can enjoy the workplace until the day you leave, but you don't have to look over your shoulder once you have."

Groovy coins sell out

All 10,000 Centenary of Federation coins minted using CSIRO Manufacturing, Science and Technology expertise have sold out.
The Royal Australian Mint sold out of the limited-edition Finale coin within weeks.
The Finale coin is the first Australia coin to feature a hologram-like Optically Variable Device (OVD), which is composed of a series of microscopic grooves.
The OVD switches between an image of the rotunda from the 1901 inauguration ceremony in Sydney's Centennial Park to a map of Australia, depending on the angle of view.



Face value: *Dr Russell Marnock displays photoresist plates that show optically variable devices like those used in the Finale coin.*

Foot-and-mouth test closer

Diagnostic tests to differentiate between animals infected with foot-and-mouth disease (FMD) and animals vaccinated against the disease could be on the horizon.
The tests are on the agenda of a meeting of international FMD scientists.
The scientists will gather, for the first time ever, in Australia at CSIRO's Australian Animal Health Laboratory (AAHL) from March 4 to 8.
They will share results from an international research project in its fourth year, which is jointly coordinated by the International Atomic Energy Agency and the UN's Food and Agriculture Organisation.
Developing the mooted tests would allow FMD outbreaks around the world to be controlled using vaccines, and reduce the reliance on mass slaughter.
The program has examined a variety of institutional and commercial kits to detect antibodies to FMD.
The project's ultimate aim is to produce one test that will work in all species and breeds of animals around the world.

Taking the bite out of malaria

Australian scientists could stop the spread of malaria by genetically modifying mosquitoes so they cannot carry the disease, according to Sustainable Ecosystems' Dr Stephen Davis.
"We have been trying to get some funding to get a PhD student working on it," he said.
It is possible to modify whole populations of mosquitoes by releasing relatively low numbers of engineered mosquitoes, just three per cent of the wild population each generation, according to Dr Davis.
"It's a general technique that can be used in just about any gene in any wildlife population," he said.
Malaria was just one example of diseases the process could prevent.
The difficulty is to overcome natural selection, nature's way of propagating genes.
"You don't want to make a super mosquito," he said.
His plan is to introduce engineered males with two copies of a type A gene, and two copies of type B.
Offspring that inherit A and B together will be fine, but those that inherit either A without B or vice versa will die. Eventually every individual will carry both A and B
Dr Davis joked: "I've tossed around the idea of introducing a gene for zoophillia into mosquitoes so they prefer to bite animals, rather than humans."

Line up: *CSIRO HSN staff hosted the conference dinner at the Melbourne aquarium's fishbowl.*

Human genome conference links science and industry

CSIRO's inaugural pharmaceutical and medical biotechnology conference was held in February in Melbourne.
CSIRO Health Sciences and Nutrition developed the program and hosted the conference which was attended by local, interstate and international delegates.
The program offered a combination of "big picture" issues facing the industry and specific science and technology presentations.
Dr Colin Reddrop from AstraZenica in Britain delivered the keynote address on the challenges facing the pharmaceutical industry in the post-genome world and several speakers discussed the interface between science and society, with emphasis on ethical issues.
Specific science topics such as therapeutic targets, genomics, bioinformatics and drug discovery brought scientists and commercial people from CSIRO, industry and other research institutions together.
After the first day of seminars, delegates enjoyed dinner inside the giant fishbowl at the Melbourne Aquarium. Venture Capitalists and research leaders rubbed shoulders with CSIRO scientists and industry representatives as over 40 species of marine life provided a spectacular moving backdrop.
The conference was considered a great success by those who attended with many already promising to return for next year's conference which will build on the relationships established in 2002.
- Warrick Glynn, CHSN

Living treasure retires

Iris Train joined CSIRO Entomology 35 years ago because she was restless at home. She wrote in her employment application that she was "completely fed up with being at home, as running a home for my husband does not take all day."

Circle of friends: *Pat O'Mahony gives Iris Train a parting hug.*

Iris Train joined CSIRO Entomology 35 years ago because she was restless at home.

She wrote in her employment application that she was "completely fed up with being at home, as running a home for my husband does not take all day."

Her outstanding organisational skills, humour and warmth have been a feature at Entomology since then until Iris retired on February 5.

"Living treasure" was a term frequently applied to Iris by staff who relied on her – in her various administration roles – to retrieve a missing file or find a supplier for that rare widget.

She was the keeper of keys and the one who would threaten us with her mythical "big stick" if our Visa and Diners statements were outstanding.

Iris is colourful. She nurtured the office plants and had a couple of surprising hobbies, keeping rabbits and following motorbike racing.

One colleague commented: "Iris introduced me to Superbike and 500cc Grand Prix racing. She would sit up until all hours watching the telecasts."

Another colleague said: "When I die I want to come back as one of Iris's rabbits, pampered pets that they are."

Iris could also keep a secret. She was inevitably privy to who did what, when and to whom but she always maintained a discreet silence about such matters, to such an extent that she would have been a credit to ASIO if they had been able to entice her away from Entomology.

It was no surprise to find such a large and diverse group of Entomology staff, both past and present, at Iris's farewell. From Chief to chief bottle washer all wanted to share their respect, affection and gratitude for "Our Iris". ■

The final Bob and Jane show

Bob Marshall began his CSIRO career in Sydney in 1964. His job was to provide general assistance as a Clerk Class 1 in the Staff and Salaries Section, and his salary was £621 a year.

In 1972 he was promoted to Assistant Training Officer.

Bob married a CSIRO technical specialist, Carol Edworthy, in 1974. He is devoted to his family and those who know Bob, Carol and their children rate his family as among his very finest work.

Bob completed a Bachelor of Science degree at the ANU in 1978 with a double major in psychology and a major in human sciences.

In early 1978 he transferred to the Regional Administrative Office, Canberra, as the Personnel Officer and OIC of the Staff and Salaries Section.

Later in 1978 Bob was promoted to the Special Projects Unit in head office. A year later he was appointed as Ministerial Liaison Officer. During this time Bob had to control ministers such as Jim Webster 1979 (Liberal), David Thompson 1983 (Liberal) and Barry Jones 1983-1990 (Labor).

It was said about Barry Jones: "Holy hell, a minister who asks questions!" Bob dealt with this in his usual cool, relaxed, comatose fashion.

Bob's particular skills were recognized when he was appointed Secretary to the Committee of Review of CSIRO's External Communication activities during 1984 to 1985.

Having had enough of political life, he transferred to the Staff Training & Development Unit in September 1987. He was appointed Assistant General Manager, Employee Development Unit, Human Resources, in the Corporate Services Department in November 1988.

In December 1988 he was awarded a Qantas/CSIRO Study Award and visited various institutions in the United States to study human resource development strategies in research organisations.

He was appointed as a Corporate Executive in December 1990 and in the same year completed his Master of Public Policy degree at the ANU.

And, how boring, he achieved yet another promotion in 1992.

Bob's files (three of them) are littered with letters of appreciation for Bob's skills in contributing to a wide range of courses, workshops and seminars.

In 1991 Bob began a Doctorate of Philosophy.

In 1998, Bob was appointed Honorary Principal Fellow with the title of Associate Professor in the Melbourne Business School.

Bob's life changed dramatically in October 1991 when Jane Maxine Lowther joined CSIRO as Manager, Executive Development Programs.

Jane quickly made her presence felt and was promoted in July 1993 and again in 1995. She was appointed the inaugural Director of CSIRO People Development for six months in July 2001.

Jane's file also contains many letters expressing appreciation of the contribution she has made over the last 10 years.

This formidable twosome, affectionately referred to as "The Bob and Jane Show" and "The Dynamic Duo", was responsible for the development and facilitation of many of the programs conducted by the Leadership Career and Team Development group over the last decade.

Bob and Jane are highly respected and loved by all those in Australia and overseas who work with them and experience their programs. Their combination of complementary skills and styles cannot be replaced. They will be much missed as individuals and as a team by many in CSIRO, and by the organisation they have served so well for a combined total of 47 years.

- Margaret Redford and Tony Culnane, People Development ■

Australia Day honour for former Argonaut

Manager of CSIRO Education Mr Ross Kingsland has been appointed a Member of the Order of Australia for his services to education through the development of science-education outreach services.
Mr Kingsland said: "It is a recognition of what my team has been able to achieve. I would not have been able to do that without a dedicated group of science educators."
Mr Kingsland, a former ABC Argonaut, established CSIRO's Double Helix Science Club.
Some of his other well-known initiatives include National Experiments such as Earthworms Downunder, The Helix and Scientriffic magazines, Creativity In Science and Technology, which enables students to undertake their own scientific research projects, and the BHP Science Teacher Awards.
"We are constantly looking for new ways to reach people, making the most of modern technology," he said.
"For instance we have recently introduced Science By Email and jointly produce the half-hour weekly science TV program with Totally Wild on Network Ten."
Former CSIRO staff member Mr John Watt was also appointed a Member of the Order of Australia.
Mr Watt, a CSIRO Chief Research Scientist in the 1980s, developed various analytical instruments for the coal, minerals and oil industries that led to substantial increases in the profitability of these industries.
CSIRO Board Member Mr Norbury Rogers was appointed Officer of the Order of Australia for service to the accounting profession and executive membership of a range of financial, technology and research corporations.

Greenhouse pair win $50,000 Victoria Prize

Atmospheric Research's Dr Francey and Dr Paul Steele are joint recipients of the $50,000 2001 Victoria Prize for their internationally acclaimed work on greenhouse gases.
Chief Research Scientist Dr Francey and Senior Principal Research Scientist Dr Steele established CSIRO's Global Atmospheric Sampling Laboratory in Aspendale in 1989.
Since then the two scientists have played a central role in developing and implementing strategies to overcome problems that have prevented different laboratories from sharing greenhouse-gas data.
Their work has long been acknowledged internationally and strongly endorsed by recent major international developments based on their approach.

Visionary leader

Dr Alan Edward Pierce, CBE, DVSM, MSc, PhD, DSc, FRCVS, FACVSc **1920-2002**

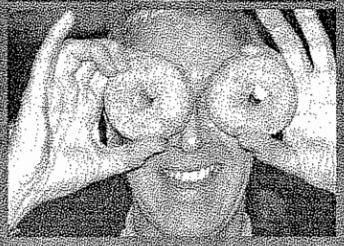
Dr Alan Edward Pierce was a visionary leader.
He had a detailed knowledge of research projects resulting from his deliberate process of visiting scientists in their laboratories. Alan had exceptional human qualities. He was a skilled communicator, at ease with people, engaged and engaging with a ready and subtle wit.
Alan was born in London, and graduated in 1941 from the Royal Veterinary College, London. He had a distinguished career as a scientist, particularly at the Agricultural Research Council's Institute of Animal Physiology at Babraham, and was notable for his research on mechanisms of the development of the immune system in cattle. He took up the position of Chief of the Division of Animal Health in 1966.
It was clear very early in Alan's term as Chief that his vision was grounded in a sound knowledge of economic realities. He believed that the ultimate aim of all programs should be the application of research results in the field, and that research should target the economically significant livestock diseases. He held equally strongly that scientific validity required a balance between applied and fundamental research.
In his term as Chief, he effected a major restructure of research along discipline-based lines and, recognising the role that molecular biology must play in future advances, established a Molecular Biology Section.
His term was one of expansion, with a new building at Parkville. Alan also played a major role in the establishment of the Australian Animal Health Laboratory.
His term as Chief was followed by full-time membership of the CSIRO Executive from 1973 to 1978. In 1979, Alan was appointed Minister (Scientific) to the Australian High Commission in London and it was from this position that he retired in May 1982, and returned to Canberra. His service to veterinary science was recognised by the Australian Government in 1980 with the CBE awarded under the British honours system.
Alan died suddenly on January 23, 2002 near Hanoi, while on holiday. He is survived by his wife, Margaret, a son, a daughter, and four grandchildren.
He is remembered at CSIRO with admiration and respect.
- Heather Mathew

Gentle samaritan

Ron Pack 1918-2002

Mr Ron Pack, a quiet, gentle, family man, passed away at the age of 81 on January 16.
He had been confined to hospital for the past 12 months after a severe stroke in December 2000.
Ron joined CSIRO at the age of 18 and worked as senior technician at Floreat providing support in research focussed on developing and introducing different varieties of subterranean clover to agriculture in Western Australia. He retired in 1983 at the age of 65 after almost 47 years of dedicated service.
Ron Pack began duty in Queensland in 1936, transferred to Western Australia in the early 1960s and worked closely with Dr Reg Rossiter in the Division of Plant Industries and, later, the Division of Land Resources Management (CLRM). When CLRM was disbanded in 1981 he became attached to Animal Production and remained there until his retirement.
Ron was renowned for his quite nature and placid approach to solving problems. Eric Watson, a former OIC of the Glenlossie field station at Kojonup in Western Australia, once said that Ron and Reg were the only two people he knew who could work together as a team and communicate effectively without actually uttering a word.
Throughout his working life and in his retirement Ron got great pleasure out of helping others.
He was a keen tennis player and became an honorary member of the Onslow Road Tennis Club. He mowed the club's lawns and marked the court on a regular basis, and his lawn mowing extended to providing a helping hand to a number of elderly widows in the district.
After his retirement Ron was instrumental in organising the Floreat Retirees re-unions and his efforts in maintaining the annual Christmas BBQs will be sadly missed.
- Kevin Eatt, CPI

O caption:my caption



Last issue's photographs of Chief Executive Dr Geoff Garrett and communicator Bianca Nogrady generated some interesting responses.

John Stephens from Minerals:

In the old days we used match sticks to keep our eyes propped open.

Richard Sakurovs from Energy Technology:

Edible glasses now come in a variety of colours. We're auditioning for a bit part in The Simpsons.

Peter Chapman from Tropical Forest Research Centre:

Divisional view vs Corporate view of strategic planning re-focussing.

Rikki Whyte from ITS:

Ohhh, I see. You meant ROSE-coloured glasses. (top photo) I must admit from here things are looking decidedly crumby (bottom photo).

Alan Andersen from Sustainable Ecosystems:

CSIRO Chief Executive Dr Geoff Garrett announces the extent of government funding increases for the next triennium (bottom photo). CSIRO communicator Bianca Nogrady puts a more colourful spin on the announcement (top photo).

And the winner is Xanthe Wells from Molecular Science:

Geoff Garrett: A new Flagship Program (BHAG)! What every Australian needs in 2020 will be edible optical devices! But how will we sell this idea? Xanthe has won a groovy key ring with liquid that appears to defy gravity when it slowly slides down a spiral column.

This issue's fishy photograph of Mikael Hirsch from CSIRO's Biotechnology Strategy was taken at the Melbourne aquarium.

Send captions and photos to CoResearch Competition, PO Box 225, Dickson, ACT, 2602 or email Karen.Robinson@csiro.au

defining:moments

Metal mettle

BY **STEPHANIE LAVAU, CMST**

Despite a family tendency to abandon science for balancing books, Roger Lumley from Manufacturing, Science & Technology remains committed to metallurgy.

Roger, a physical metallurgist, leads a project on tweaking the heat treatment of aluminium alloys to improve their mechanical properties. Roger shared an anecdote with me that proved that at the age of six he was already a scientist in the making.

"On my first day in Grade 1, it was obvious to my teacher that I could read quite well, so she sent me to the library while the others began learning to read," he said.

"The librarian showed me some books to read, but having already read those I chose a geology textbook instead. When the librarian caught me, she didn't believe I could handle the book so she asked me to read out loud. I did. The teachers were pretty amazed. By the end of the day, I ended up reading out loud to both Grade 1 classes about fossils."

Is there some family history behind this interest in earthy elements?

"No, neither of my parents were scientists," he admits. "But one of my brothers was a geologist before doing an MBA and becoming an accountant. The other is a mining engineer and runs a company called Ground Breaking Innovations. He's now studying for an MBA."

For CSIRO's sake, we hope that Roger's mettle remains strongly fixed on metals.

the last:word

"Dwindling funds means the CSIRO, one of the world's foremost government agencies, has had to choose between two masters: the interests of big companies that fund it or the interests of Australians."
- Financial Review, January 8

"Worried Australian scientists are hoping Garrett can work some magic and turn the base metal of government funding into research gold."
- Financial Review, January 8

"To CSIRO and staff who organised the showing of the movie The Dish at the telescope in the sheep paddock. Absolutely fabulous with the telescope there beside the screen and the moon present as well."
- Champion Post, Parkes, November 28

"Anything that has the current CSIRO supremo, Geoff Garrett, bubbling with enthusiasm, as this new department [DEST] has, is certain to have a good bit of the synergistic about it."
- Canberra Times, December 7

"Despite the hype over possible surgical training applications, the tacky verisimilitude this [haptic] software generates is most likely to win commercial application in online games and porn markets."
- Canberra Times, January 28

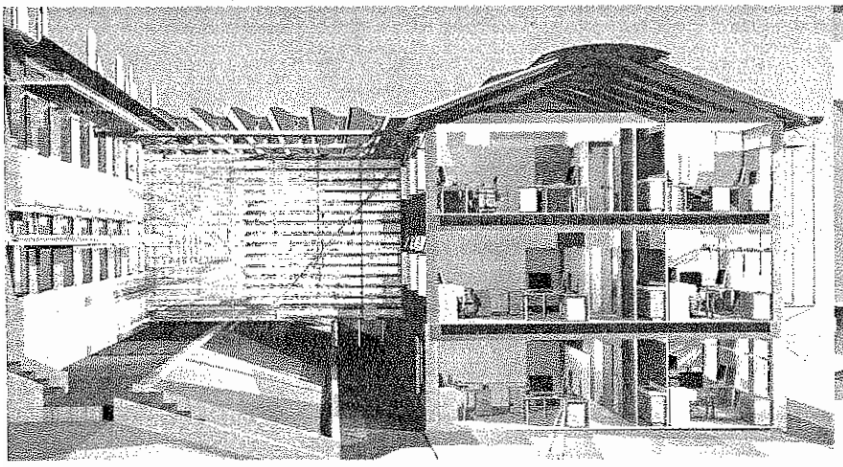
CSIRO

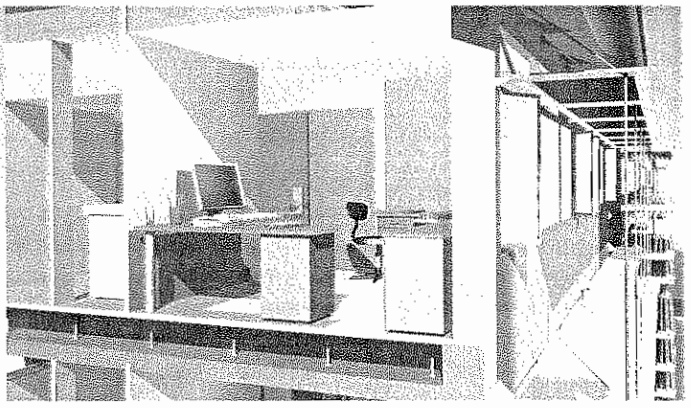
co research

CSIRO'S STAFF MAGAZINE NO. 391 WINTER 2002

Building for the future

The construction of a unique $32 million energy centre was recently begun on Newcastle's Steel River eco-industrial park. BY **MEGAN BIRD**





CSIRO Energy Technology Chief Dr John Wright said: "It will be the most energy-efficient building of its type in Australia, if not the world."

The centre will house about 100 staff, generate most of its own energy, act as a showcase for the sustainable-energy industry and foster industry partnerships and technology transfers.

It will produce about half the greenhouse gas emissions of a conventional building its size.

That's a saving of 2,000 tonnes of greenhouse gas a year, the equivalent of taking 700 cars off the road.

Dr Wright said: "We're investing a lot of money into research and development of future energy sources so we decided we would have to practise what we preach."

All staff will be encouraged to be aware of energy issues when they move into the centre next year.

A computer-screen display will keep them informed of outside conditions and advise them when it is best to open or close windows.

A Building Management System will monitor and control services such as heating and cooling.

An under-floor system will cool or heat offices up to 1.5m from the floor. This will allow staff to work in comfort but not wastefully heat or cool entire rooms.

Maximum use of natural light will mean that artificial lighting will rarely be needed during the day.

The building will use five different types of glass, including one that reflects heat.

Most of the energy the building will generate will be via wind power (32 per cent). Freestanding microturbines (30 per cent), and three different types of photovoltaic cells (18 per cent) will also be used. Down the track Polymer Electrolyte Membrane fuel cells (20 per cent), a solar-thermal system and 1 megawatt energy-storage system will be incorporated.

Dr Wright said: "It's going to be a bit of an experiment in how to integrate all of this. I have no doubt we will make mistakes because nothing like this has been tried before.

"The lessons learned on integrating small-scale energy systems to deliver the centre's energy needs will help us identify where additional research needs to be done.

"It will also demonstrate the technologies to industry and generate new business."

At the site dedication earlier this year NSW Premier Bob Carr said the energy centre's aim would be to "rehearse the future".

Big day in: About 50 staff from North Ryde exhibited items such as country craft (1), a canoe (2), folk art (3), needlework (4), abseiling equipment (5), cross-stitch (6), handmade dolls (7), and winemaking equipment (8). A troupe of Latin dancers performed (9).

Staff show off their strange range of interests

A pet snail, a sumo wrestler's thong and ceramic dragons were some of the items North Ryde staff chose to show off at a recent get together. BY **MEGAN BIRD**

Staff from Food Science Australia and Molecular Science were cajoled into bringing some of the paraphernalia of their hobbies into work.

The Big Day In was organised to facilitate rapport between staff from the two divisions who will move into a new building at North Ryde later this year.

About 200 staff attended the lunchtime event, and about 50 of them exhibited.

A troupe of Latin dancers entertained the crowd, while the results of a pet look-alike competition amused them. The winners were Kathy Schneebeli and her pet frog.

Collectors were there in force with examples of items ranging from African drums to Aboriginal paintings.

Many of the staff demonstrated their passion for sport.

An abseiling kit was rigged up to a tree outside, a racing motorbike was on display, there was a canoe, golf clubs and photographs of sailing and scuba diving. Craft was another favourite pursuit.

Fine needlework, quilting and lacemaking were exhibited alongside woodwork mirrors.

Some of the earthier exhibits included winemaking equipment, plants and jams.

Molecular Science organiser Fiona Cameron said: "People were fascinated to see what everybody did outside work.

"And although I had to break a lot of arms to get people to bring items along a lot of people wished they had brought something once they saw the incredible range on display."

Fiona reluctantly displayed her ceramic dragons.

"I was afraid I was going to be called the dragon lady from then on but it didn't happen," she said.

Fiona made and sold her dragons to help fund her way through university.

Food Science Australia organiser Brigitte Cox said: "We held a similar event a few years ago when morale was a bit low.

"This event was just as successful because a team of people organised it and staff from the two divisions started talking to each other."

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Send contributions to CSIRO Internal Communication
PO Box 225 Dickson ACT 2602
Phone: **02 6276 6639**
Fax: 02 6276 6273
Email: internalcomm@csiro.au
hr.flo@optusnet.com.au (to contact Megan Bird) or
Karen.Robinson@csiro.au

Contact Karen Robinson to add or delete your name to the CoResearch mailing list.

An IT manager who can go the distance

We all know CSIRO is famed for its excellence in science, but it is also home to champions and high achievers in other fields of endeavour.

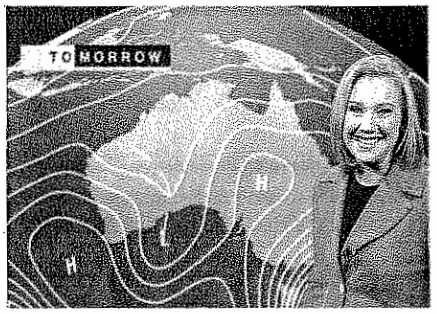
We're proud to announce that Mark Hipworth, Manufacturing Science & Technology's IT Manager, has had the rare honour of being inducted into the Stawell Gift Hall of Fame.
Less than 25 people have been inducted into the Hall of Fame. Mark is the youngest, and one of the few living, inductees.
He has been racing in the Stawell Gift for 23 years and holds the record for the most number of places in races, 28, including four wins.
The event, Australia's largest athletics carnival, consists of 10 races held each Easter.
The premier event is the 120m race, which started as a dash across the goldfields in 1878. Back then, the first prize came with enough cash to buy a house.
Mark races distances ranging from 120 metres to two miles.
"I'm considered an oddity because in 1981 I had two wins at 550 and 800 metres, and a third place at 400 metres," he said.
Mark has also been coaching other athletes for about 15 years. His team at the Stawell Gift boasts 10 winners in the last seven years.
Mark is a former Australian professional champion at 800 metres.
"Then I broke my femur from running too much," he said.
Last year he won a silver medal in the 4 x 400 metre relay at the world veterans' competition, and we're expecting great things at this year's masters' games.
In the meantime, here's a challenge. How do we fit these performances into our organisational key performance indicators? ■ **- Stephanie Lavau, CIC**

Mark Fergus,
On track: *Mark Hipworth is a gun athlete.*

Presenting Jaci Brown BY MEGAN BIRD

Jaci Brown's flatmate has banned her from talking about the weather, but ABC television in Tasmania is paying her to do just that.

Jaci, a mathematician based at CSIRO Marine Research, worked as the ABC's weather presenter for two weeks in May while regular presenter Mike Pook was on leave.
Mike, who has been presenting the weather for the past 17 years, has a PhD in meteorology and is a former secretary of CSIRO's RV Franklin steering committee.
Jaci said: "Mike's a legend. So I have big shoes to fill."
Jaci spoke to CoResearch the day before her first shift and admitted to some nerves.
"It is still, unfortunately, the stereotype that young girls that present the weather are only there to give you a pretty face and friendly smile.
"I'll be wearing very serious suits because I'm 24 and blonde."
Jaci, a mainlander, was also concerned about pronouncing place names correctly.
"Tasmanians are very particular about pronunciations," she said.
Jaci, who is working on a PhD relating to climatology, has good credentials for the job.
She presented for The Weather Channel on Austar for 18 months while she was studying in Sydney. But the station was only televised in rural areas.
"I am a bit nervous because I've got to face everyone the next day if I stuff it up," Jaci said.
Keeping her information brief is also likely to be a challenge for Jaci. She is used to having an hour to prepare a 20-minute weather segment. At the ABC she gets three hours to prepare a three-minute spot.
"Both Mike and I get pretty excited by the weather and could both do a 10-minute segment on it each night," she said.
"People remark that it's a nice day, and I go on about the weather for 20 minutes."
Jaci will spend her preparation time for bulletins wisely, discussing the forecast with Bureau of Meterology scientists, condensing this information, memorising it and updating graphics.
"The weather is live and there's no autocue," she said.
She is able to cheat a little by marking up the blue screen behind her with the important features, such as the position of cold fronts.
Jaci says she enjoys science communication.
"It keeps your feet on the ground.
"I have been studying El Nino and used to think that it would be great for my research to have another like the severe event in 1997/98.



On the map: *Jaci has good credentials for the job.*

"But when you present the weather you realise the human cost of it and the fact that what you're studying is actually important."
There is one proven way to stop Jaci talking about the weather. Blame her for it.
"I once told a taxi driver that I read the weather," she said.
"I had to sit through a 20-minute lecture about how a friend's sister's dog can predict the weather better than weather forecasters.
"The truth is that people only remember when forecasts are wrong. Most of the time they are right, and when they are wrong it's only the timing that is out." ■

One-dollar inventors receive their dues

"At last. My one dollar," exclaimed Colin Waterford when he opened the presentation box his wife had collected for him from science minister Peter McGauran in Canberra recently. "Now I can really celebrate."

Case opened: *Mr Colin Waterford was delighted with his award.*

Colin was one of 32 CSIRO Entomology staff named on patents or who had contributed much to the division's recent commercial success stories. They were recognised at the division's first Inventions' Celebration in Canberra on May 1 as part of the Australian Innovation Festival.
Each staff member received a "one-dollar award", an engraved timber plaque featuring a one-dollar coin.
The significance of the dollar is this. Only individuals can take out patents so a condition of employment at CSIRO is that staff members who take out patents must assign their patent rights to CSIRO for the token sum of $1.
CSIRO Entomology's Business Development Manager Sid Jain said: "As far as I am aware, no-one in CSIRO has ever got their one dollar.
"We plan that the celebration will become an annual event."
The 2002 plaques were presented to staff working in six areas: biopesticides, soil diagnostics, pest-control innovations, grain-storage technologies, and bioremediation ■

- Malcolm Robertson, CE

Students improve cricket deliveries and water tanks

A separate ceremony was held for student inventors during the Australian Innovation Festival.
They revealed the secrets behind bowling better cricket deliveries and stopping water tanks from overflowing at CSIRO Discovery in May.
Two young Western Australians who took part in the Celebrating CREST Awards invented a device that stops water tanks overflowing. This year's Western Australian Young Person of the Year, Jason Le Coultre, and co-inventor Jerome Brown were at a farm belonging to Jerome's family when the water tank overflowed. The incident inspired the students to do something about this common rural problem as part of a CREST program.
Cricket fan Andrew Jackson presented the results of his scientific study about cricket bowling techniques on different surfaces and in wet and dry conditions.
CREST is run by CSIRO Education to encourage original scientific discovery and technological innovation. More than 5,000 students complete a CREST program each year. ■

Energy count down around Australia

About 20,000 Australians are expected to take part in a national energy-use experiment being coordinated by CSIRO Education and the Australian Greenhouse Office (AGO).

Power play: *Thousands of Australians will take part in the kilowatt count.*

The National Kilowatt Count of Household Energy Use will run in August as part of National Science Week.
The aim of the survey is to alert householders to the amount of energy they use and greenhouse gases they produce, how they can reduce this, and to foster awareness of climate change.
Householders will read meters, record petrol consumption, public-transport use and complete a simple questionnaire during the kilowatt count.
They will be able to calculate their annual energy consumption and greenhouse-gas emissions and compare it with the average energy use for their town or city.
This will be the third national experiment run during National Science Week. About 10,000 people took part in last year's experiment. At least double this number are expected to take part in this year's study, thanks to some targeted marketing by CSIRO Education and the AGO.
Extensive stories about the project are being published in The Helix and Scientriffic magazines, which have a combined circulation of about 25,000.
Every school in Australia will be offered a kit containing curriculum-based activities, posters and a comic book.
CSIRO's Double Helix clubs in most states and territories will hold energy-related events in August.
Project coordinator Rob Simpson said: "We expect students will take the experiment home and the information will filter through to the decision-makers, their parents."
The earth's climate will rise by between 1.4 and 5.8 degrees by 2100 if no action is taken to control greenhouse gas emissions, according to the Intergovernmental Panel on Climate Change. During the last ice age temperatures were an average 5 degrees cooler than they are now.
The project is sponsored by the AGO, Alcoa World Alumina Australia, Energy Australia and Transgrid.
Visit www.kilowattcount.gov.au or phone 1300 130 606. ■

Hearty inventor wins award

A scientist whose invention has earned millions of dollars for CSIRO is this year's winner of the Sir Ian McLennan Achievement for Industry Award. BY **MEGAN BIRD**

Dr Pathiraja Gunatillake's pioneering work on synthetic materials is set to improve the lives of heart disease suffers around the world.

The tri-leaflet heart valve utilises Dr Gunatillake's unique polyurethane technology and is scheduled for clinical trials in Europe next year.

The story of this innovation began in 1988 when Dr Gunatillake began research under a government grant to develop synthetic polymers for cardiac pacemakers.

He worked on the project for three years to develop a family of polyurethanes that he demonstrated to be more durable and stable than conventional polyurethanes.

Then under a grant from the CRC for Cardiac Technology he developed three more families of polyurethanes that were suitable for a variety of medical implants, including heart valves.

The Graduate School for Biomedical Engineering at the University of NSW carried out sheep-implant experiments to evaluate the material.

Existing synthetic heart valves are either mechanical or made from pig tissue. Patients with mechanical valves need to take anticoagulant drugs for the rest of their lives. The problem with the bioprosthetic valve is that it tends to calcify.

The tri-leaflet valve appears to have overcome both these problems, and looks likely to last at least a decade longer than the others.

The CRC sold the technology to AorTech Biomaterials two years ago. CSIRO, a major partner in the CRC, reaped a $6.8 million return from the deal.

The materials were customised for use in heart valves with AorTech's help, and a further breakthrough produced a material with excellent biostablity and high mechanical endurance.

The next step is to obtain regulatory approval.

AorTech Managing Director Mike Skalsky said: "The worldwide heart-valve market is worth $1 billion a year. It's expected that this new valve will make a major impact on that market."

The tri-leaflet valve is expected to have particular benefits in developing nations.

While existing valves have a life of between eight and nine years, the tri-leaflet valve could last for 20 years or more.

Dr Gunatillake said: "I am told it is not uncommon in places like the Middle East for children with rheumatic fever to develop heart-valve problems.

"It's quite satisfying to see this technology being developed. If Aortech wasn't doing it we would not have been able to do so."

The polyurethanes Dr Gunatillake developed are unique because of their high silicone content, and hold potential applications for many other implant devices.

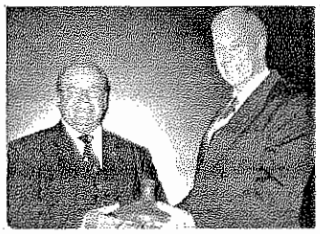
AorTech has used the technology to collaborate with leading vascular stent technology company Jomed to develop a vascular stent that is used to open up blocked arteries. This development is also approaching clinical trials.

Mr Skalsky said: "Dr Gunatillake is one of those quiet achievers who is very confident, focussed and likeable."

Dr Gunatillake is concentrating on new areas of research.

He will use the $15,000 prize money from the Sir Ian McLennan award to visit overseas laboratories involved in tissue engineering.

"This next generation of products can help the body to repair organs," he said. ■



Presidential ceremony: *Dr Brian Anderson hands over to Dr Jim Peacock (left).*

Peacock elected to head academy

Plant Industry Chief Dr Jim Peacock has become the third CSIRO head of the Australian Academy of Science. BY **MEGAN BIRD**

The last CSIRO staff member to head the academy did so 20 years ago. Dr Lloyd Evans, also from Plant Industry, was President from 1978 to 1982.

The only other CSIRO scientist to hold this prestigious position was Chief Scientist from the Upper Atmosphere Section, the late Dr David Martyn, who was President from 1969 to 1970.

CSIRO Chief Executive Dr Geoff Garrett said: "Jim's election is a great tribute to CSIRO Plant Industry, which he has led and maintained as one of the world's leading bodies in plant molecular biology."

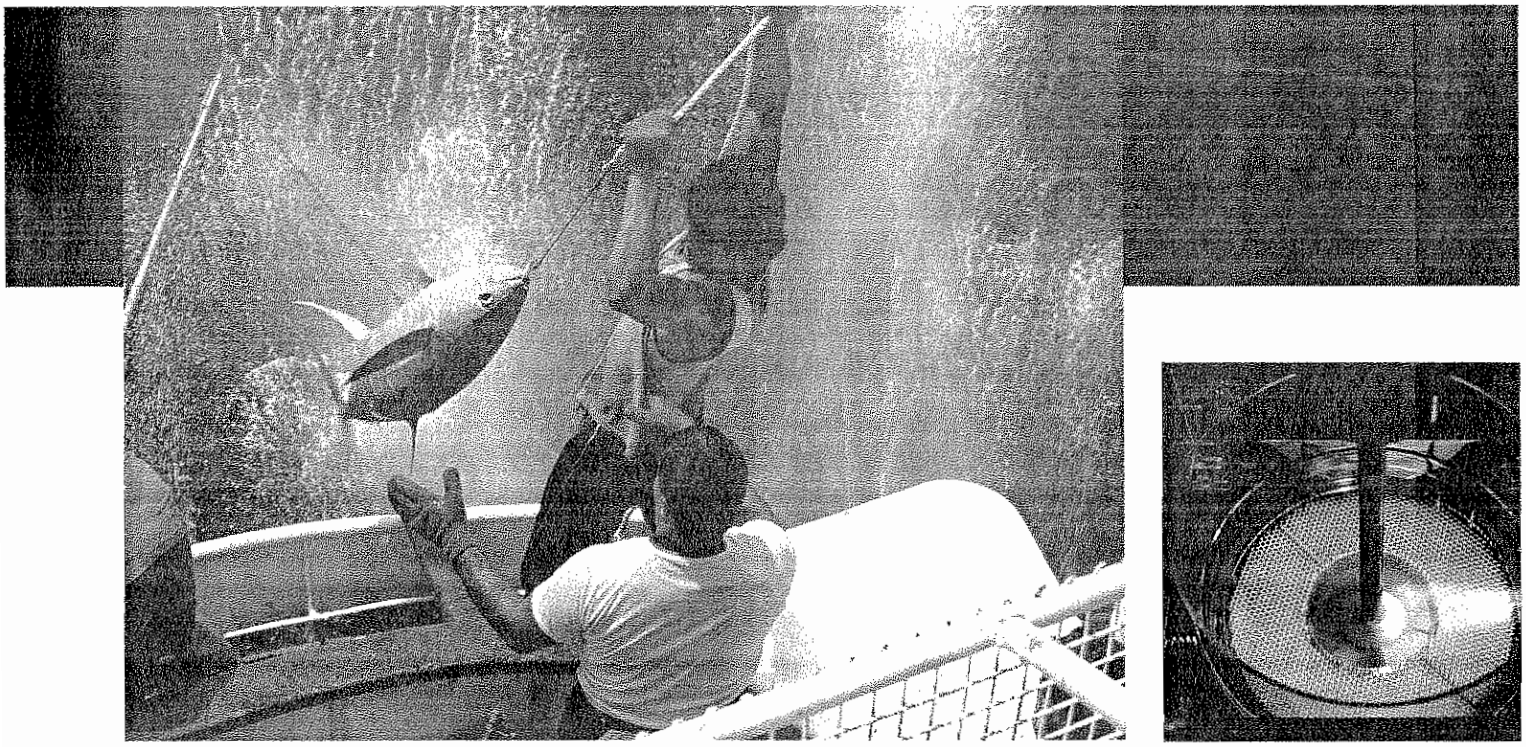
"Being elected President of the academy complements his Prime Minister's Prize for Science in 2000 and being elected a Fellow of the Royal Society."

Dr Peacock said: "I will be working hard throughout the next four years to promote the role of science in contributing to Australia's prosperity.

"Immediate challenges include the higher education review and the setting of national research priorities."

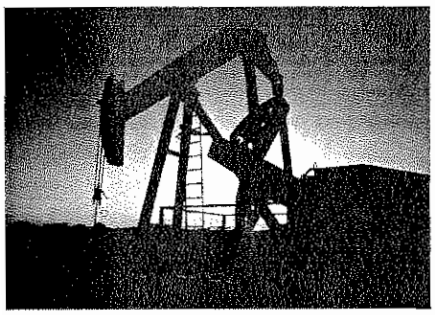
Fourteen new fellows were elected to the academy this year, including Dr Ezio Rizzardo from Molecular Science and Dr John Jacobsen from Plant Industry.

The academy, which has 342 fellows, was formed as an independent non-profit organisation in 1954. It informs government and promotes public debate, research excellence, science education and awareness, and fosters international relations. ■

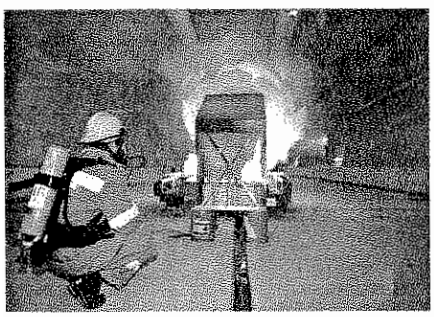


Thor Carter, *Marine Research*

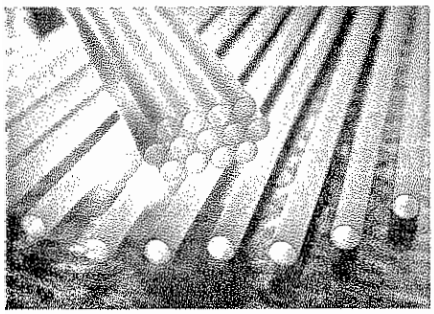
Lawrence Cheung,
Building, Construction and Engineering



Chris Taylor,
CT Image Technology



Tracey Nicholls,
Building, Construction and Engineering



Mark Fergus,
Manufacturing Science and Technology

Dusty darkrooms

Darkrooms are gathering dust, digital technology is replacing film, and the number of CSIRO staff photographers is dwindling.

There were about 60 staff photographers a few decades ago. A handful are left.

Mark Fergus from CSIRO Manufacturing Science and Technology (CMST) said: "Years ago the CSIRO photographers and graphic staff in Melbourne alone would get together and fill a small restaurant.

"We could have a meeting in a phone box these days."

Melbourne is, nevertheless, home to more than half of CSIRO's full-time snappers. Building and Construction employs three of them in its Image Technology department.

Tracey Nicholls, a photographer there for 19 years, said: "The job has changed enormously.

"We're just about to decommission our film-processing facilities and we haven't used darkrooms for the last five years."

Tracey and her colleagues have adapted to the changing industry by becoming multi-skilled.

"It's probably the only reason we're still here," she said.

"Photography's only a small part of the work we do now."

Graphic and web design, making video reports of research results, producing scientific brochures and posters and trade-show displays are other roles the group has taken on.

Manager for the group Neil Hamilton has been at CSIRO for 41 years.

He explained that a 1987 amalgamation of Mechanical Engineering and Building Research ensured photography and scientific imaging remained strong at Building and Construction.

"Our skills diversification has enabled us to remain an essential part of the researching and marketing functions within the division," he said.

CSIRO's last two photographers in Sydney were not in such a strong position.

Geoff Lane and Chris Taylor were made redundant last year.

Geoff had been on the job for 28 years, and remembers when photography was a valuable research tool.

"All that interesting work finished when the user-pays system was introduced in the late '80s," he said.

"The expertise is lost. That's the evolution of economic rationalism," he said.

"It's time to move on."

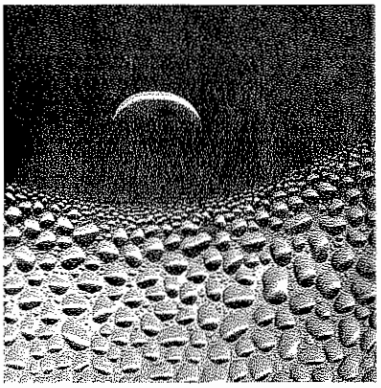
Chris started his own business and still does a lot of work for CSIRO. He has a small office at North Ryde and is CSIRO's only on-site photographer in New South Wales.

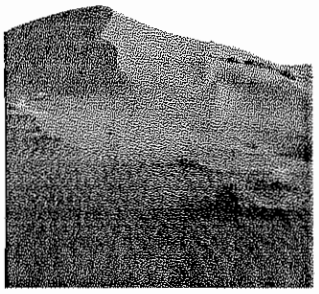
"No-body could tell us why we were made redundant, but it's been good for me," he said. "I've got an instant client base.

"I'm getting stacks of work, and I'm just as busy as I ever was."

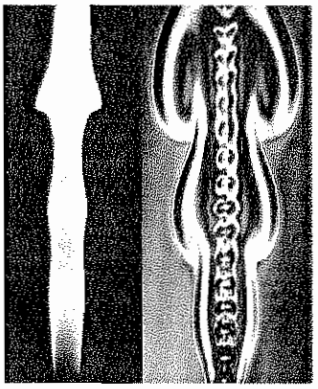
The photographic department in Tasmania was closed eight years ago.

One of its photographers, Thor

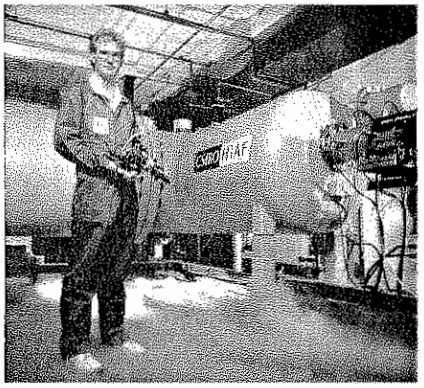




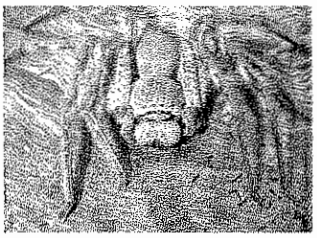
Willem van Aken, *Land and Water*



Neil Hamilton,
Building, Construction and Engineering



Geoff Lane, *former CSIRO photographer*



David McClenaghan, *Entomology*

Carter, worked there for a decade. These days he takes photographs for fish taxonomists one day a week and works as a fisheries technician the rest of the time.
He noticed the demise of photography in Tasmania was related to the expansion of the communication area.
"It was considered they could contract out photography and get better value," he says.
"They save money, but they don't end up with an ongoing resource."
All CSIRO photographers enjoy their work and have positive comments to add.
David McClenaghan from Entomology spends a lot of his time photographing live or preserved insects.
"It's a real privilege to photograph stuff that most people would never get to see in their lives," he said.
"In some cases I photograph specimens that are the only ones in existence."
One of his most exciting jobs was photographing a live funnel web spider.
"I was 5cm away while someone upset it so it would have poison dripping from its fangs," he said.
Mark has different challenges at CMST.
He, like David, does a lot of high-magnification photography. But he and his equipment are also exposed to extremes of temperature.
The furnaces and molten metal he photographs can be as hot as 1,000 degrees. He has stepped from that into a bitter -25 degrees to photograph Antarctic ice cores for Atmospheric Research. It was a feat to stop his gear from freezing up.
Mark said photographers had good overviews of how CSIRO works.
"One of the best things about my job is getting to meet a lot of people across the organisation. You get a real snapshot of what people are doing," he said. ▩

Self portrait: *Thor adapts well to change.*

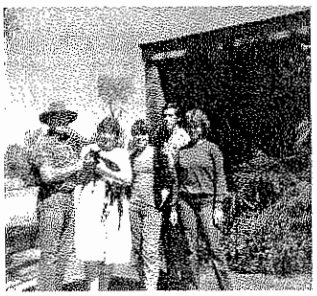
Chameleon commuter

Thor Carter is notoriously good at adapting to changing circumstances.

When there was not enough work to occupy him full-time as a photographer, he became a fisheries technician who took photographs one day a week for fish taxonomists.
Thor has made similar adaptations in other areas of his life.
He used to paddle his canoe to work.
"I gave up paddling on a dark winters evening when the police launch nearly ran me over," he said.
"They were doing 25 knots in an 8 knot area. It was a southerly Hobart wind and freezing cold. I could hear them coming but had no lights so I paddled very fast.
"I took up cycling until it snowed on me.
"The only thing left was to run in. That didn't last long. Up and over the bridge was not my idea of fun. Now it's the life of Reilly on the open sea." ▩

Scientist with a swag

Diaries peppered with hilarious and affectionate anecdotes have given CSIRO's operations at Alice Springs a human face. BY **MEGAN BIRD**



Family Album: *Des Nelson, above and right, illustrated his booklet with personal photographs.*

The author of Me And CSIRO, Mr Des Nelson, maintains the longest and most vivid memory of CSIRO operations in the Alice.
He launched his booklet in December at Alice Spring's Town Library and, in doing so, immortalised the camaraderie and ingenuity of early operations.
The book is blended from notes Des made since he began keeping a personal diary in 1950 and work notebooks in 1959.
Des first encountered CSIRO in 1954 when, while he was working as a jackeroo on a station, a CSIRO vehicle got bogged.

Bog

"I ... had just learned to drive, so very proudly drove off in the station Chevrolet Blitz to tow the CSIRO vehicle out of its bog," he wrote.
He began working at the Herbarium of the NT in 1956 and, a year later, joined CSIRO's Division of Land Research and Regional Survey as a microclimatology assistant.
The tales Des relates expose his commitment to CSIRO, his colleagues and his work, along with a larrikin streak.
In 1957, for instance, passing motorists would sometimes enquire about what was going on in an enclosure near a CSIRO shed.
Climatological data was, in fact, being collected.
But Des wrote: "The recordings were so diverse that it would take a lot of time to explain them so I made up a little story for the curious...
"I would tell them we were experimenting with the production of alcohol from spinifex, such a product being named Triodicol.
"I believe there were some who thought this to be true."
Hardly a page of Des's memoirs goes by without some reference to the bushcraft and ingenious solutions that he and his colleagues applied.
Readers will suspect that Des loved his field trips as much for the scientific activity he undertook as for the solitary beauty of the bush he experienced.
He relates tales of shooting galahs and snakes, dodging goannas and sandgropers, hiding soap from crows and feeding dingoes.
Other memorable bush experiences are mentioned in passing: an encounter with a Min Min light, a haunted camp site on Amburla, an eight-year drought, and witnessing a lightning strike ignite a grass fire.
Then there's the campfire yarns.
"John Turner was the only person I knew who had sheets in his swag," he wrote.
"One warm moonlit night his swag was invaded by a swarm of small green jassids.

Blankets

"My swag, which just had blankets in it, was left alone by the insects."
He brings his colleagues to life in his book.
"At one stage we had a cleaning lady, a funny little Scottish lady known as Mrs Mac," he wrote.
"She would come to Gregory Terrace late in the day and if she was near the telephone when it rang she would pick up the hand piece and say, 'CRIOS. There's nobody here!' and hang up.
"It didn't matter if there were others around, there'd be

'nobody here' and she'd always mix the letters of CSIRO.
"It might be 'CSRIO' and the next time 'CRSIO' but never 'CSIRO'."
Des's long battle with computers began in 1978 during a project to compare the efficiency of three separate methods of ground-cover density.
Samples were taken, the results sent to Adelaide and computer printouts sent back.
"The figures were so ridiculous they were utterly laughable," he wrote.
The data was sent back to Adelaide many times, with similar results.
Eventually Des sat down with a calculator and discovered the garbled results were the result of columns of figures being misaligned.
"It was a classic case of a person entering data from a project about which such person knew nothing," he wrote.
Des had countless more adventures until his avoidance of computers was noticed in the '80s when he was 51.
"I had spent too much of my life occupied with bush work and found it difficult to adapt to the monitor and keyboard," he wrote.
Des was excused, thanks to his usefulness in many other areas, but was not let off the hook for long.
"Attempts were made to get me to become a computer operator, but I was not made for this...
"So I decided to take early retirement at 55, which came due in mid-1990."

Nightmare

Des has continued to undertake a wide variety of field trips, consulting for CSIRO and the Northern Territory Department of Primary Industries and Fisheries.
And even his computer nightmare cannot taint his memories of CSIRO.
"I left CSIRO with nothing but the happiest of memories and a feeling of gratitude for the treatment I had experienced from the organisation," he wrote.
"CSIRO people were my friends.
"To CSIRO Alice Springs I say good on you and thanks." ▩

Memorial fund for Set Nguyen

The memorial fund set up to commemorate Mr Set Van Nguyen, who died in a workplace accident, has been used to buy a computer for his family.

Acting Director of AAHL Dr Stephen Prowse said: "The fund was used to buy a computer, software and Internet access to assist in the education of Set's daughters, Ann and Lyn, who are of school age."
The fund will close on August 1. Those who wish to contribute before then can make cheque or debit donations to "Set Nguyen Memorial Account 824548" (no deposit slip necessary) and send them to: Melbourne Australia Credit Union, GPO Box 1700P, Melbourne Victoria 3001 or to any Members Australia Branch.
After the CSIRO inquiry into the death of Mr Nguyen last December at CSIRO's Australian Animal Health Laboratory (AAHL) the CSIRO action plan addressing the recommendations has been released across the organisation.
Occupational Health, Safety and Environment Manager Mr Colin Macdonald said the CSIRO-wide actions will be implemented within a year, audited a year after that, and a safety-culture survey is planned for 2005.
The action plan addressing the AAHL-specific recommendations is underway, and will be completed within a year.
Improvements to the safety culture are being addressed in the Occupational Health, Safety and Environment element of the CSIRO Strategic Action Plan.
Mr Macdonald also said protocols to guide any future committee of inquiry into a serious safety incident will be completed by August this year.
A copy of the report into Mr Nguyen's death is available to staff at http://www.csiro.au/intranet/aahlincident
Hard copies are also available in CSIRO libraries at all sites. ▩

Wellings accepts key UK appointment

One of Australia's leading research managers, CSIRO Deputy Chief Executive Dr Paul Wellings, has accepted a job at one of the UK's leading research universities.

He will leave CSIRO in August to take up the position of Vice-Chancellor at Lancaster University in the north-west of England.
CSIRO Chief Executive Geoff Garrett said Dr Wellings would be a great loss to the organisation's top management team.
"He is one of the leading research managers in Australia. Given the breadth of his experience and creativity he will be a tremendous asset to Lancaster University and the innovation system in the UK," he said.
"While Paul will be greatly missed at CSIRO, having him located in one of the key research universities in the UK will help strengthen the links CSIRO has to significant international institutions and create further opportunities for collaboration.
Dr Wellings, who trained as an environmental scientist, has been a member of CSIRO's Executive since 1999. Before that he was Chief of CSIRO Entomology and head of the Science and Innovation Division of the Department of Industry, Science and Resources.
He played a key role in reinvigorating the innovation policy debate in Australia, in positioning CSIRO's research in natural-resource management and, in the past year, in shaping the organisation's strategy for business development. ▩

The good oil in seafood

Cooking or curing seafood does not reduce its high levels of beneficial oils, according to Marine Research.

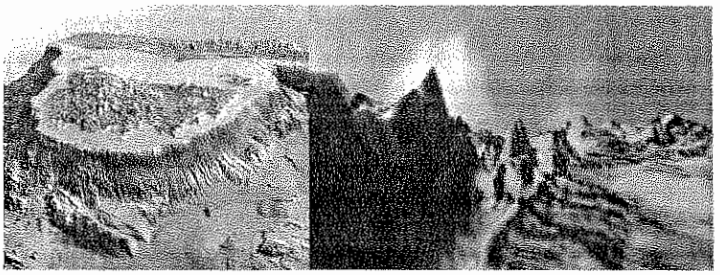
Raw facts: *Dr Peter Nichols' team has found that cooked seafood retains its healthy oils.*

The latest research shows that Australian seafood – cooked, raw or processed, wild or farm-raised – is the best source of nutritionally important omega-3 polyunsaturated fatty acids.
Seafood contains up to 100 times the levels of these acids than foods such as beef, chicken and lamb.
Dr Peter Nichols said: "We've determined that frying, grilling, steaming, microwaving and curing have no adverse effects.
That must be good news for seafood lovers."
Omega-3 polyunsaturated fatty acids may prevent heart disease, stroke, premature births and prostate cancer and could be helpful in the treatment of rheumatoid arthritis and some forms of depression.
The research, funded by the Fisheries Research and Development Corporation, is presented in a book, Seafood The Good Food II.

Close look at bunny briefs

Rabbit-wool underwear could become a luxury new fashion item.
CSIRO Livestock Industries is investigating the establishment of a new angora rabbit industry in Australia.
Angora is one of the world's finest fibres.
The angora fibre is blended with superfine wool, mohair, silk and alpaca to produce fashion garments and extra warm underwear.
Angora rabbits are shorn every three months to yield about 250g of angora. Prices range from $20 to $30/kg clean weight.

Underwater tour of a place no-one has been



A part of Australia that nobody has ever seen can be viewed by the world's first virtual tour of the ocean floor.
More than two million square kilometres of ocean off eastern and southern Australia were mapped with sonar equipment to develop the computer-animated virtual tour.
The tour is a simulated view of dramatic seascapes up to 4km below the ocean's surface.
Extinct underwater volcanoes, a massive canyon with an entrance 15km wide and sheer cliffs are some of the tour's highlights.
The view shows how water flowing off Australia's continental shelf has created a series of canyons that scientists believe may be home to undiscovered species. It will provide valuable geological and biological information for Regional Marine Planning to manage human activities such as conservation, fishing, biotechnology and mining.
The tour is a joint project of the National Oceans Office, CSIRO Marine Research and Geoscience Australia.

Small particles amount to a big deal

While astrophysicists are working on the challenges posed by travel through outer space, material scientists from Manufacturing Science & Technology have been addressing a much smaller scale problem: how to selectively move molecules through nanospace.
By adding nanoparticles to manipulate the nanospace in manufactured materials, these scientists can design selective separation devices or filters that alter the journey of molecules through the materials. The potential applications of this research range from keeping the bubbles in your brew to extracting natural fuels.
Anita Hill and her colleagues shared some of this exciting research with CSIRO staff in a live-from-the-lab seminar that celebrated the end of the 90-day e-CSIRO project on cyberseminars. About 150 staff from seven sites watched this videoconference presentation on the equipment, methods and ideas behind these small-scale developments.
Some new cross-divisional projects and positions are now in the pipeline.
After the success of the pilot study on cyberseminars, a new e-CSIRO project is building on the potential of video over Internet protocol to bring other great, and small, CSIRO happenings from around Australia to your doorstep, or desktop.

- Stephanie Lavau, CIC

Beetle ousts dinosaur

In what is likely to be a world first, a CSIRO entomologist has shown that size and age do not always matter.
A humble beetle from Madagascar has outset a Jurassic dinosaur in the battle for naming rights.
CSIRO Entomology's Dr Adam Slipinski recently discovered that an insect and a dinosaur shared the same name.
A palaeontologist described a species of carnivorous dinosaur from Zimbabwe in 1969 and named it Syntarsus, which means "fused ankle".
Dr Slipinski discovered that a tiny beetle that also has segments of its feet fused was given the name first in 1869.
No two species can share the same name and the first species named has priority. Dr Slipinski proposed the dinosaur be called Megapnosaurus which, in simple terms, means "big dead lizard".
He said: "As far as I know this is the first time an entomologist has named a dinosaur."

Field safety is stepped up

Geoscientists in remote locations ranging from mine sites to mountain ranges have an extra layer of safety, to a new tracking system.
CSIRO Exploration and Mining can locate where its field staff are thanks to the Startrack system that is fitted to the roof of research vehicles or carried in a backpack.
The system uses a combination of GPS and satellite communication technologies, and locations are displayed via a secure web page.
Mr Stephen Fraser said: "The most common problems in the field are vehicle breakdowns, flat tyres and getting bogged.
"We haven't had a serious incident for over a decade, but we don't want to be complacent," he said.
Field teams are already equipped with satellite phones and emergency position-indicating radio beacons.
The Startrack system is a backup to a range of improved field-safety operating procedures that were implemented after a review of procedures began last October.

Ground glass safe to walk on

Walking on ground glass is safe, economical and environmentally responsible, providing it has been prepared using CSIRO guidelines.
Crushed glass can safely be substituted for sand in some municipal and building-construction works.
Ballarat City Council became the first council in Australia to use recycled glass in concrete earlier this year when it poured footpaths and disability access ramps.
Dr Kwesi Sagoe-Crentsil from Building, Construction and Engineering said: "Around 16 per cent or some 20,000 tonnes each year of all glass in Victoria, for example, is not reprocessed into containers or used in other primary markets and is currently dumped as unsuitable for recycling."
Ground glass has a variety of other applications, including using it in insulating, filtration and drainage products and for sandblasting.

A man of great integrity and intellect

Dr John Lamberton, 1925-2002

Dr John Lamberton will be fondly remembered by his former colleagues as a shy man of great integrity and a formidable intellect.
John was one of the most prolific and creative of Australia's post-war organic chemists. His abilities were well summarised by Dr J R Price in a promotion case written in 1966.
He wrote: "He is an outstanding man who has solved every chemical problem he has tackled. He has been able to do this because of his first-class experimental technique, his knowledge of the subject and his capacity for clear analytical thinking."
Interest in the constituents of Australian plants of value as possible medicinal drugs was sparked by the need to find local sources of several essential drugs of plant origin during World War II. This in turn revealed the lack of phytochemical knowledge of indigenous plants and a collaborative project involving scientists from CSIR, the University of Sydney and the University of Melbourne began.
Activities in the project increased after 1945 and it became a large CSIRO project known as the Australian Phytochemical Survey. The inadequacy of local resources for screening for biological activity led CSIRO, in 1956, to enter into an agreement with Smith, Kline and French to test selected alkaloids. Dr Lamberton took over the project in 1964 and, with the assistance of the late Dr Stan Johns, made in Dr Price's view "an astonishing impact on the program".
One measure of this impact is that of the 2022 papers in the Bibliography Of Australian Phytochemistry 1940-1987 Dr Lamberton was an author or co-author of 173 papers, 31 more than the next highest contributor. Since his retirement in 1986 his papers have been cited 300 times.
John joined CSIRO's Division of Industrial Chemistry in August 1951 as a Research Officer. He retired a Chief Research Scientist just after he turned 61 in 1986. *- Tom Spurling, CMS*

the last:word

"Boardroom boffins must 'lift their game'"
- Australian headline on a biotech story, April 26

"Boffins in for their cut"
- Gold Coast Bulletin headline on conference organised by four CSIRO divisions, April 30

"Spiralling crime rates could see Neighbourhood Watch running our courts. Just think what a committed Rotary group could do with the CSIRO."
- Sydney Morning Herald letter to the editor on Malcolm Turnbull's arguments on education funding, April 18

"Who said the CSIRO was inhabited by the ranks of very serious, often vague and very bright nerds? There is humour in abundance ... That's probably why CSIRO chief Dr Geoff Garrett issued a directive ... to come up with a BHAG proposal."
- Narrabri Courier, April 20

"Labor Senator Chris Schacht compared the sale with barbarians 'raping and pillaging' CSIRO's castle."
- Financial Review, February 28

O caption:my caption

There were some heavenly overtones to last issue's fishy photograph.

Tom McGinness from Mathematical and Information Sciences:
Okay apostles. I've done the fishes. Now bring me a loaf.

Victoria Haritos from Entomology:
Introducing CSIRO's latest Biotechnology Project called "Flying Fish" or "Chicken of the Sea" as it is more commonly known.

Albert Trajstman from Mathematics and Information Sciences:
A CSIRO-via-Biotechnology-Saviour thinks to Himself: "It's a goer. I've turned the water to wine, started multiplying the fishes. Now let's get some bread and perfect that saintly look."

Debra McGrath from Land and Water:
Oh, waiter, over here. My fish appears to be a little underdone.

Paul Brebner from Manufacturing and Information Sciences:
Jesus, I have a partially drunk bottle of wine and a few small fish. But how far will they go among so many?
Mikael confuses the miracle at Cana with the feeding of the five thousand.

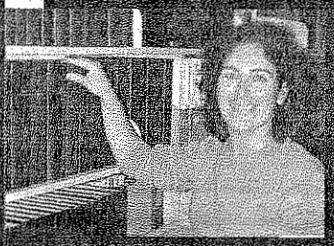
Denise Schilling from Marine Research:
And they say that it is pigs that fly.

Randall Gray from Marine Research:
After an unfortunate start where the loaves were turned into flying fish, the customary benediction was offered....

Patrick Smith from Sustainable Ecosystems:
CSIRO Biotech Strategist Mikael Hirsch fends off an all-too-friendly genetically modified fish at a recent dinner showcasing GM Innovations. Dr Hirsch later declared the waterless fish a "bad idea" saying that despite their inquisitive nature they were even harder to catch than their aquatic progenitors.

And the winner is Tom McGinness from Mathematical and Information Sciences:
I do solemnly swear that I'll have the fish, the whole fish and nothing but the fish, so help me God.
Tom has won a game that involves cars, trucks and traffic jams, The Rush Hour Game. ■

defining:moments



Confessions of a bookworm

BY **MEGAN BIRD**

Danila Durante's obsession began when she got her first library card.
"I remember the day," she said.
"It really was a turning point.
"I was 10. My friend told me I could get a borrowing card from the public library, and it was free."
Danila took the application form home for her mother to sign, was issued with her treasured library card and began lugging reading material home at a rate of 20 books a week.
Earlier that year she had emigrated from Africa via Europe.
Many of the books she chose were stories of other children in far-away countries.
"It made my own transition into another country a little easier.
"I found books on the library shelves that just had me agog," Danila said.
Danila took her head out of a book during high school long enough to announce her plan to become a librarian.
"I didn't enjoy the reading program at school.
"Reading was a more serious activity I did in my own time.
"The teachers were very surprised about this as I was very active in sports and didn't fit the bookish stereotype they had so I reluctantly put down accounting as my second tertiary preference.
"They seemed happier with this.
"And I just hoped like mad that I didn't get into accounting. To this day I just don't like it at all."
Danila has worked at CSIRO for 13 years, five of them as the Library and Information Services Manager at Health Sciences and Nutrition.
She deals with thousands of publications a week, most of them in electronic format.
"It's an ocean," she said.
"We're dealing with an information revolution and it's an exciting time to be a librarian.
"It makes you a very powerful person in your profession if you can use a library well.
"And the scientists here are very good library users. They value their library and really appreciate the role of information in science."
Danila is still a committed bookworm, and admits to keeping some of them under her bed. ■

This issue's photograph was taken in Etosha National Park in Namibia. Chris Margules from Sustainable Ecosystems was part of the foolhardy research team there that pushed their broken-down vehicle out of trouble, despite breaking down next to a warning sign that read "Stay in you car". The group learned the reason for the sign when 700m up the road they spotted a pride of eight lions.

Send captions and photos to CoResearch Competition, PO Box 225, Dickson, ACT, 2602 or email Karen.Robinson@csiro.au ■

CSIRO

co:research

THIS ISSUE

Plastic palace: *Cynthia Love has inspired staff to collect snowdomes. Photo: Mark Fergus*

Queen of kitsch

does a morale snow job

Snowdomes, beer labels and old electronic equipment that ordinary people would normally dump are some of the more unusual items CSIRO staff are going to great lengths to hoard. BY **MEGAN BIRD**

The collecting bug seems to have infected one whole office in Melbourne where more than 90 snowdomes were recently sighted.

The architect of this group eccentricity is self-confessed kitch queen Cynthia Love, from Information Technology Services.

Cynthia, a manager, watched a restructure take its toll on staff about four years ago.

"Morale was decimated and we weren't a team anymore," she said.

"This was just something silly I did to get them smiling again." The rules of Cynthia's game require each staff member, whenever they travel, to search out and bring back a snowdome.

"The uglier the better," she says.

Cynthia has a set of shelves filled with some of the world's tackiest souvenirs. They are, in fact, beginning to find her.

International visitors and overseas friends of the office have begun posting them in.

There is a snowdome pencil sharpener, a ring with a penguin in it, a Christmas collection, pink fluffy pig, snowdome soap and a snowdome containing a likeness of the Twin Towers that was purchased after September 11.

Cynthia asked CoResearch to mention the fact that donations to the collection are always welcome, especially a cat-motif snowdome.

She has, she says, a "smallish" collection of cats. She meant to say she has several hundred cat-motif collectables as well as two of the real thing.

CoResearch is unsure if collecting strange things has something to do with the scientific method being second nature to staff or if it they are simply odd.

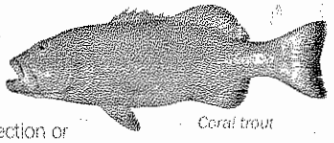
Cynthia opts for the latter.

"CSIRO staff have this quirky view of the world and there's this tremendous humour that permeates the organisation. That's one of the things that keeps me here," she said.

• *More collective madness in profile, Pages 5, 6, and 7*

Irreplaceable collections

CSIRO houses and is responsible for some of Australia's and the world's most important official scientific collections.



Coral trout

These valuable collections represent many lifetimes and millions of hours of work.

The Australian National Fish Collection or The I S R Munro Ichthyological Collection, has an estimated 135,000 specimens.

Ian Munro established it about 60 years ago.

Collection manager Alastair Graham said: "We can't pinpoint exactly when he established it because he always had jars of specimens in his office.

"When does a group of jars constitute a collection?"

The collection has been used in the publication of a score of books and hundreds of taxonomic and other papers. Items are regularly borrowed from it, and researchers often visit it.

"One of its strengths is the concentrated effort we have made to photograph specimens to capture the near-life colours that are bleached out in the preservation process," Alastair said.

The collection has 30,000 slides of specimens.

Munro's efforts, about 50 cruises since, fisherman and fisheries observers have supplied specimens.

"It's the most important collection in Australia for shark and ray species and deep-water fishes," Alastair said.

Some of the cruises have trawled as deep as 1,500m.

Continued on Page 7

A career that began with a kick up the backside

Andrew Krajewski's career as an electronics designer began with a kick up the bum and a childish search for the tiny man inside his family's radio.

Andrew's father had told his five-year-old son he would get a kick if he put his finger in the powerpoint.

Andrew said: "He did not specifiy where I would get the kick so I assumed it would be to the bottom."

Andrew was fascinated by why the family's radio was plugged in, and was curious to know if he would receive this kick if he tried to find out.

He waited until his parents were at work and his nanny had popped out for a chat with a neighbour.

"I was so naive that I plugged my finger into the powerpoint. I wanted to know what went on there," he said.

Andrew craned his head to keep a close eye on his bottom to see if his father's warning would come true.

Instead, Andrew received a jolt to his finger. Undeterred, he decided to approach the mystery from another angle.

He dismantled the family radio to find the midget inside who talked.

This was the 1960s and radios were expensive.

When his father came home to see the prized family possession in pieces Andrew did, in fact, get his kick up the backside, but it did not stop him from pursuing a career in electronics.

He tinkered at school and at the Polish equivalent of Scouts.

Andrew built two small radios, but encountered another problem when he built a small transmitter and receiver.

He had unintentionally broken the law. It was illegal in communist Poland to own an unregistered transmitter, as Andrew found out when his father received official notification of this.

Andrew quickly dismantled the transmitter.

He went on to build digital computers for himself and his friends, and to study electronics at university.

He left Poland in 1991 for the more lucrative job market of Australia and joined CSIRO in 1995.

Andrew is completing a doctorate in technology at Deakin University, and designs and builds instruments for CSIRO Textiles and Fibre Technology and its commercial partners. ■

Retirees club together

Many CSIRO retirees can be found travelling around the world, on croquet, bowling or golf greens, bushwalking, consulting and at regular SIRET functions.

The social group for retirees and their surviving spouses has two chapters, in South Australia and Canberra, and a combined membership of more than 150.

And they are just as sharp as they always were.

SIRET South Australian member Geoff Stirk said: "The CSIRO people of my generation are a dying group.

"So many staff these days are on short-term contacts.

"They don't have the feeling for the organisation that my contemporaries had.

"These days there appear to be professional managers. When all executives were scientists a decade or two ago the science was unimpaired. Managers understood the problems and worked for the common good."

The Canberra SIRET chapter has twice as many members as its southern cousin and organises a few social trips, including a five-day odyssey, each year.

Both organisations send out regular newsletters and organise a number of lunches throughout the year.

The newsletters relate news on the wanderings and adventures of members, event details and some whimsy.

The latest South Australian newsletter, for instance, tells us: "The trouble with retirement is that every day is like the day before pay day."

Membership is $5 a year in South Australia and $10 a year in the ACT.

SIRET was established in the '80s.

For more information contact Geoff Stirk in South Australia on 08 8379 3894 or Jeff Taylor in Canberra on 02 6241 1903. ■

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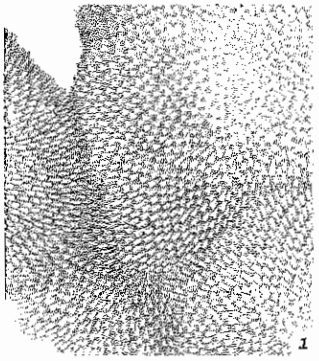
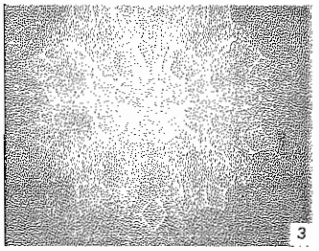
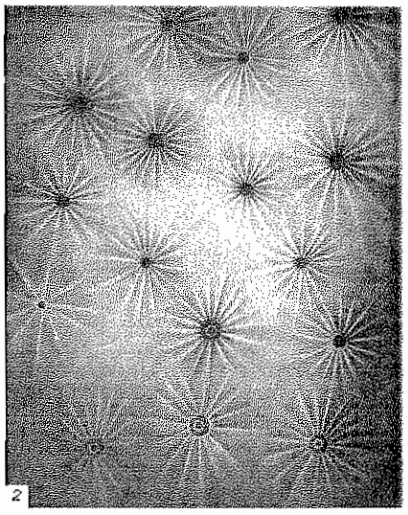
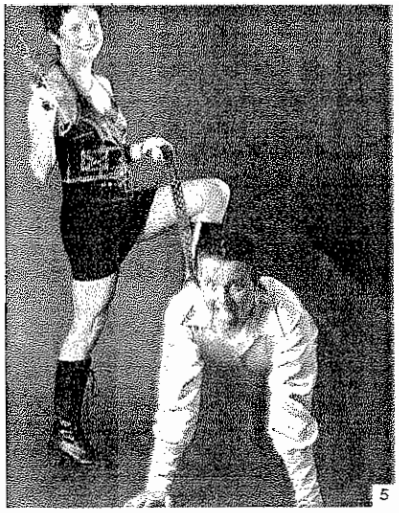








The science of art:
Colony (watersipora), oil on canvas, by Anne Morrison who linked up with scientist Caroline Sutton (1) for The Synergy Exhibition; Nanoflagellates, charcoal on paper on canvas, by Helen Wright who observed the work done by Jeannie-Marie LeRoi (2); and Mandala, pastel on paper on canvas, is a different perspective on DNA by Dawn Csutoros who worked with researcher Simon Jarman (3).

Aroused minds: *Chris Krishna-Pillay (left) was a guest of ABC Science's Paul Willis and Bernie Hobbs (5) at The Science Of Sex In The Pub, and helped launch National Science Week with a song and, assisted by Minister Peter McGauran, an experiment. (4)*

Staff take science to pubs, markets and cyberspace

Scores of CSIRO staff throughout Australia helped launch and host National Science Week events in venues ranging from pubs and markets to classroom and cyberspace. BY **MEGAN BIRD**

CSIRO Education's Chris Krishna-Pillay composed a song for the event's official opening in which he managed to rhyme the science minister's name "McGauran" with "moron".

The flamboyant Krishna-Pillay sang about science to the tune of Love Is In The Air.

Part of the song ran:

"And I don't know if I'm being foolish
I don't know if I am a moron
But there's something that I must believe in
And I share it with Peter McGauran."

Mr McGauran, who helped officiate at the launch, helped Krishna-Pillay with a foaming experiment, and referred to him unexpectedly as "K-P, Chrissy-Poo".

Mr Krishna-Pillay resurfaced two days later at a pub in Canberra to discuss The Science Of Sex In The Pub with ABC Science's Paul Willis and Bernie Hobbs.

Mr Krishna-Pillay scientifically explained, among other things, why humans are more attractive to a potential mate when they already have one.

The answer had something to do with pheromones, but the details were lost on most of the audience who left in an inebriated haze.

The tone of the Australia-wide event was lifted in Tasmania by the cultured bunch down there who hosted Science In Salamanca.

Research on everything from aging fish larvae and plankton to DNA and dolphins was transformed into works of art when a score of scientists teamed up with 12 artists to present Synergy.

Related events staged at the scenic waterfront location included a science-and-art trail that snaked through two other exhibitions and an installation in progress.

Student artwork was displayed at one of the venues.

More than a hundred entrants competed in the 2D and multi-media sections.

The work displayed at Salamanca was linked to a website, from which participants drew their inspiration. Visit www.marine.csiro.au and follow the links.

Co-organiser Caroline Sutton said: "The event reflects the parallel journeys of scientist and artists through observation, imagination and creation."

The Alice chose a different focus for its celebrations.

Children of all ages were entertained by the Scinema film festival, exhibitions, talks, a science fair and Sleek Geek Week, the stand-up routine of science-trivia master Dr Karl Kruszelnicki and straight-guy sidekick Adam Spencer.

The Lab on Legs walked a bit faster during the week and visited an estimated 500 students.

Australia-wide activities included CSIRO's National Scienceathon and the web-based experiment, the National Kilowatt Count.

About 5,000 students participated in the scienceathon, themed this year to consumer science. They taste-tested soft drinks, created their own biro cleaner, and captured health-salt gas in a series of experiments that were tailored to children aged four to 15.

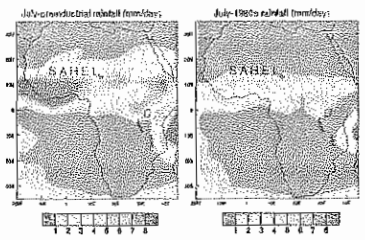
Another 5,000 people took part in the National Kilowatt Count and results were shared around the nation.

The locals went to extremes in the Northern Territory and invaded the homes of three families to compare their energy consumption in the name of exciting radio.

Telecommunications and Industrial Physics threw open their doors to the public for a day, and visitors to the Australian National Wildlife Collection were given a rare glimpse at this stunning collection.

Scores of other CSIRO activities took place around the country during this annual celebration of science.

Western pollution thought responsible for African drought



Emissions spewed out by power stations and factories in North America and Europe may have sparked the droughts in Africa that led to the '70s and '80s famines in which up to a million people died of starvation.

The Sahel region of Africa, a loosely defined band across Africa, just south of the Sahara and including parts of Ethiopa in the east and Guinea in the west, has suffered the most sustained drought in the world since records began.

Dr Leon Rotstayn from Atmospheric Research thinks he and his collaborators know what caused them.

The pollutant is sulfate aerosol and is generated mainly by burning fossil fuel and smelting metal.

These emissions are thought to have led to the overall cooling of the Northern Hemisphere and effected the movement of the tropical rainbelt.

Further support for Dr Rotstayn's findings come from the reduction in the severity of the African drought during the 1990s.

Emission controls in Europe and North America lowered atmospheric aerosol concentrations during that decade, largely because of concerns about acid rain.

Dr Rotstayn said: "This needs further evaluation, but it does illustrate how delicate the world's climate system is."

Similar effects have begun showing up in Northern China, which had successive, severe droughts from 1997 to 1999.

Pollutant levels in Asia are still increasing. ■

Fellowship to strengthen university links

A $2 million postdoctorate fellowship program will strengthen the linkages between universities and CSIRO.

CSIRO and the Australian Research Council (ARC) will award up to 10 ARC Postdoctoral Fellowships for three years each from 2003.

The ARC and CSIRO will each contribute up to $1 million to the scheme, Linkage - Australian Postdoctoral Fellowship (CSIRO), over the next three years. ■

CSIRO biotechnology moves ahead

CSIRO invests about $112 million a year in its biotechnology research, according to a recent stocktake.

CSIRO staff have been working strategically at key recent events to make sure that investment pays off.

A delegation of 19 CSIRO staff recently attended Bio2002, the world's largest biotechnology conference and exhibition.

Australia's delegation to Toronto in Canada was the fourth largest after the United States, Canada and Germany.

This was CSIRO's third coordinated visit to this important event.

CSIRO scientists were also prominent in a key national event, AusBiotech2002, held in Melbourne in August.

CSIRO launched its Biotechnology Strategy, which has been under development for a year, at the conference.

Launching the document, the Deputy Chair of CSIRO's Biotechnology Strategy Team, Professor Richard Head, said: "Our mission is to help Australia become a stronger global competitor in the 21st Century through the rapid adoption and use of biotechnologies."

Hundreds of copies of Bio Activities, a CD-rom containing interactive presentations on more than 50 of CSIRO's biotechnology activities, were distributed at both conferences.

CSIRO biotechnology research, spread over 12 divisions, include projects dealing with crop improvements, livestock health, pest-animal control, vaccine development, medical treatments and assessment of environmental impacts. ■

Panoptic customers double

CSIRO Mathematical and Information Sciences (CMIS) has more than doubled its commercial Panoptic customers this year.

Panoptic, a high-performance enterprise search engine, has been commercially available for more than three years.

Panoptic customers include the Australian Broadcasting Corporation, the Queensland Government, the ACCC, IP Australia and some universities.

The enterprise search engine can quickly locate within a university website, for instance, information ranging from exam timetables to how to get a parking permit.

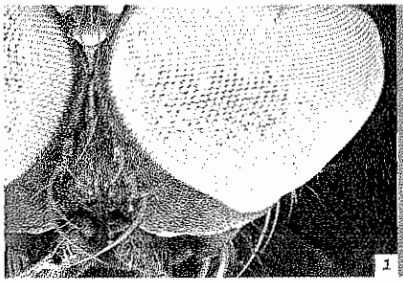
One Panoptic customer, Research Finder, indexes all Australian research websites, and recently renewed its Panoptic contract for another year.

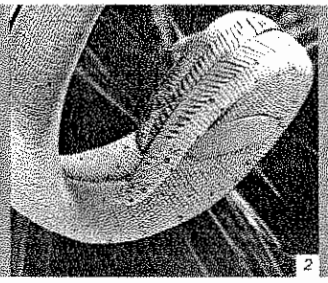
CMIS's Dr David Hawking said: "Research Finder is a genuinely useful service to industry and the Australian public.

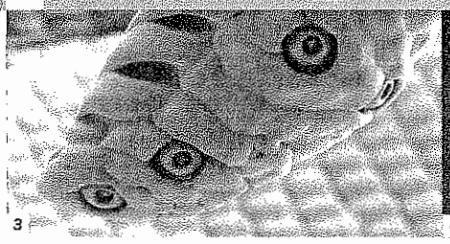
"It's important that people who would be able to benefit from Australian research actually be able to find it.

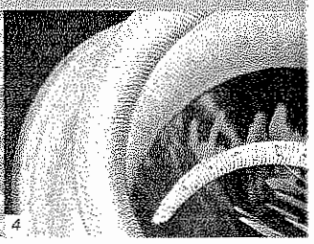
"Google and other large search engines only index a fraction of pages from CSIRO's and other research organisation's sites, and users often become frustrated by having to wade through large amounts of information that are not related to Australian research."

To use Research Finder visit rf.panopticsearch.com ■









Treasury of animal parts

There's a strange and arresting collection of tiny gold-coated animal parts such as a bee's lip, a butterfly's tongue and the eyes and feet of a fly. BY **MEGAN BIRD**

They are gathering dust alongside gold and silver-plated cockroaches, leaves and about 200 other strange but small organic items at Forestry and Forest Products in Clayton, Victoria.

Some of the stranger items in the collection were donated. There are nits from an embarrassed child's head and, courtesy of Westmead Hospital, a maggot from a cadaver and pubic louse. Tiny amounts of gold and sometimes silver have been spluttered on to them in a plasma-coating process.

This is done to make the items conductive so they can be scanned by an electron microscope and vividly colourised using a CSIRO-developed process that is being sold around the world.

The collection, which has taken about seven years to mount up, is small in comparison to the library of more than 6,000 colourised images it has helped create.

These spectacular images have been sought out and used for the covers of newspapers, magazines, text books, journals and even a music CD. CSIRO holds the copyright to all images but profits from the sale of usage rights.

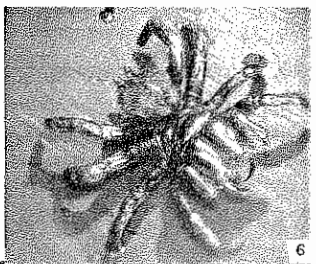
Physicist Mr John Ward and his late colleague, Mr Bob McNamee, developed the analogue colourisation process in 1988 and Australian company Dindima helped develop the digital colour package a decade later.

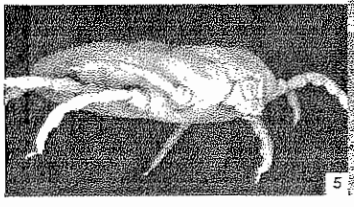
The second version of the digital colouring software, Spectrum Colour Imaging System, went on sale in August, thanks to a long-term unemployed computer programmer.

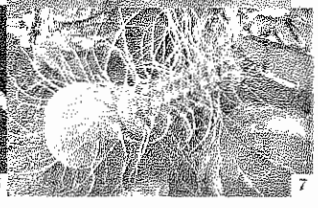
Alex Moss was made redundant as a mature-aged electronics engineer. He retrained as a computer programmer but could not find a job until Mr Ward brokered some work experience for him with the APESMA IT reskilling program.

Alex worked part time on the software update for about a year and has since gained full-time paid work as a programmer.

CSIRO will receive a percentage from sales of the software that is already being used by electron microscopists in locations such as Japan, Europe, the United States, South America and Britain.







Small selection: *Garden fly (1), butterfly's tongue (2), tip of butterfly's tongue (3), butterfly's tongue (4), cattle tick (5), gold sputter-coated spider (6) and butterfly egg hatching (7)*

CSIRO maintains five main natural-history collections:

- The Australian National Fish Collection in Hobart
- The Australian National Wildlife Collection in Canberra
- The Australian National Herbarium in Canberra
- The Australian National Insect Collection in Canberra
- The Tree Seeds Repository in Canberra

Other collections are numerous, but include:

- The Australian Animal Health Laboratory exotic animal diseases collection
- A collection of living microalgae
- Tropical forages and rhizobium collection
- Electronic journal and library collections
- Archive collections
- A memorial wood collection

Aladdin's cave of electronic knowledge

The quantities of information that CSIRO staff deal with are frequently intercepted by librarian or archival staff and put to good use as collection databases.

Former information officer Jenny Restarick who, after four decades with CSIRO, is a storehouse of knowledge herself at CSIRO Enquiries knows where most of this information is kept.

"I don't think many people know just how much information is there," she said.

There is hope for those staff who are inclined to nod weakly and smile at the sound of the inevitable stream of acronyms.

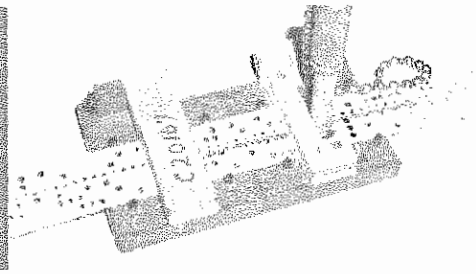
Visit www.csiro.au/services/CNAResources/commresource/acronym/acronyms.html

This database has been compiled by CSIRO Enquiries in response to an increasing number of requests about acronyms. It includes trade names of processes, equipment, technology, groups, software and a lot more.

A cataloguing and indexing tool that can be employed by researchers to locate publications and historical scientific papers ranging from divisional reports and conference papers to chapters and journal articles is CSPubList. Visit http://sirius.its.csiro.au:5750/sim1.4+simprod. Your library can provide passwords and search tips.

A family tree of births, deaths and marriages of CSIRO divisions and sections can be found at www.csiro.au/intranet/records/useful_links.htm

Enquiries and other staff use all these electronic collections on a daily basis.



A calculating trio

CoResearch has had three confessions from staff who collect the sort of calculating equipment the majority of the population would consider worthless. BY **MEGAN BIRD**

Industrial relics: *A mechanical calculator from the 1930s (right) and a five-channel paper-tape punch (above) used to program Australia's first two computers are some of the items CSIRO staff have in their collections.*

Phil Kilby, in fact, scavenged his early slide rules or "slip sticks" off dump sites.

He has about 50 of them and is surprised to have spotted them in antique shops recently fetching between $20 and $40.

"I guess I am weird," he muttered while trying to explain himself.

"I'm fascinated by this window into other people's lives."

Phil usually has his slide rules on display at work but has recently moved to a smaller office and has had to leave them in a cardboard box.

"I get them out and play with them occasionally," he confessed.

Amongst the collection is a slide rule that calculates the flow of water through a pipe.

Phil has only photographs of a rare conical slide rule.

"It's the holy grail of slide rules," he said. "They're museum pieces."

He also covets one slide rule he has spotted in his pregnant wife's doctor's surgery. It's an early calculator that can be used to predict delivery.

Instead of being presented with a cigar at the birth Phil is hoping for the slide rule.

The use of slide rules peaked in the 1950s before the calculator replaced them in the 1960s, according to Phil.

Enter John Wolff, an eccentric who collects calculators.

A staff member told CoResearch about this compulsive collector after John pinched his colleague's 1970s calculator and gave him a new replacement to compensate.

John has about a hundred calculators, mostly mechanical ones, and has been collecting them for about three decades.

John has even set up his own web "museum" site. Visit www.vicnet.net.au/~wolff

Part of history

"It's all part of the history and the engineering heritage of the country," he said.

"I like to know how calculators work and be in a position to say, 'I understand that,' and try to get into the minds of the people who made them.

"Collecting can become a bit obsessive though," he remarked.

The computer became the height of electronic fashion in the mid-1980s.

And computer programmer John Deane is on a personal mission to rescue these marvels for posterity.

"I collect the stuff that was mostly intended to be thrown out," he said.

John's obsession took hold at a conference he attended in New Zealand.

Delegates were talking about CSIRO's first computer, CSIRAC.

"This was the first time I had heard about CSIRAC," he said. "It was a spectacular pioneering achievement and I hadn't heard about it even though I was working in the division that built it.

"I was hooked from that point on."

John has since written a book about CSIRAC.

He has managed to salvage some old paper tape and other items from SILLIAC, the University of Sydney's first computer and claims, but cannot prove, that he has some early bits from Australia's first computer, CSIRAC.

"It's staggering the sorts of jobs they did with the equipment," he said.

"What keeps me collecting is the ingenuity of the people working on computers.

"But it's going out the door so quickly this stuff is virtually forgotten."

John was a one of five runners-up in a 1998 international competition where entrants were charged with writing a program for the world's first computer.

The Japanese winner wrote a noodle-timer program.

John is only limited in his collecting by the amount of space he has to store his finds.

"The whole idea of an industrial antique is probably a strange thing. The agreed value is zero or even negative," he said.

He is supported in his quest by "a sympathetic wife".

"She's a believer in history and agrees with me that these things have a value," he said.

"It's a bit scary, but I do enjoy it," he said.

A people thing

"It's such a people thing," he argued.

John, however, is under no real illusions.

"I can recognise that it's not exactly normal because I have a lot of trouble convincing people that it's worth worrying about," he said.

• Editor's note: One of the reasons this trio decided to speak on the record is because they are ever hopeful that readers might have a dusty item of relevance to donate to them. ■

The full bottle: Alastair Graham (right), the fish collection manager, has been collecting beer labels for the past 32 years.

Putting a label to an obsession

There could be a collecting gene that is common to CSIRO staff if Alastair Graham of fish-collection fame is anything to judge by. BY **MEGAN BIRD**

Alastair spends his days among thousands of fish samples, cataloguing and maintaining them.
Then he goes home and does the same with his 20,000 beer labels.
The collecting of beer labels has more social benefits than being, as his wife Pat says, "the dead fish librarian".
But Alastair has been collecting them since before he was old enough to drink.
He got hooked when, in grade 6, he rang Tooheys for some information on a school project about Australian industries.
He was rewarded with a dossier of information, including a packet of labels.
Something strange was activated in Alastair the day he opened the envelope containing the Tooheys beer labels. His family and friends are at a loss to explain it, but that insignificant missive from one of Australia's largest breweries established the pattern of Alastair's life, and possibly that of his offspring.
"Pat collects hippos," he said.
"She has 349 of them.
"One of my daughters, Nicki, collects frogs and polar bears. And Jess collects dolphins."
Collecting for Alastair and anyone in his family is not a matter of "if" but "what".
He shamelessly encourages them.
He has, for instance, presented Pat with encouragement hippos.
He commissioned the 100th hippo for her 30th birthday; the 200th, which is on a motorcycle with "2" in front of the wheels; and the 300th: which is juggling balls and standing on the figure 300.
"I don't know what actually starts people collecting," he mused.
"A lot of collections really get momentum by active support from parents.
"After that it's the interesting stories that go along with the items, the chase and, for me, the strange looks at restaurants when I ask to keep other people's beer bottles."
He keeps his collection in about 30 compact ring binders, and meticulously files them according to country and beer type.
Alastair's hobby, some say obsession, gives him a good excuse to drink. He has even used it as a good reason to have an overseas holiday.
When he travelled to Germany two years ago on a jaunt he drank 50 different beers in three weeks.
He has met other beer-label collectors on his travels.
"They have all started off thinking they're the only ones that do it, and then they meet the others.
"People will collect just about anything," he reflected.
Alastair's own collection has grown at the rate of 1,600 beer labels a year.
He does claim that he hasn't drunk the content of the bottles they all came from.
But next time you see that serious and slightly intense man in the bottle shop buying a dozen beers, each one of them a different brand, you might have an insight into what he is up to. ■

Irreplaceable collections

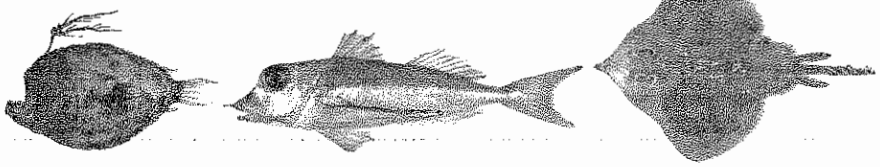
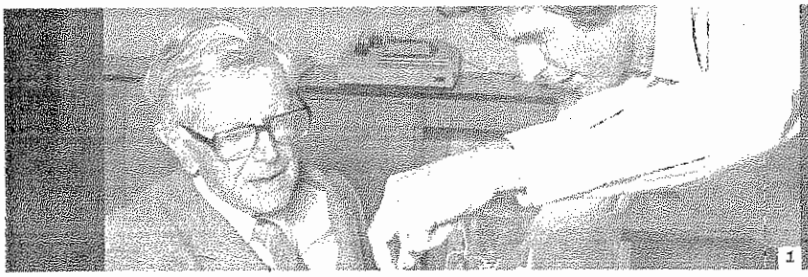
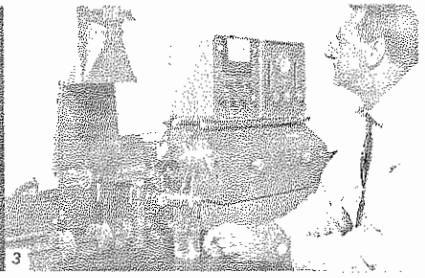


Photo finish: *Images of a Prickly anglerfish (left), latchet (middle) and skate (right) are a few of the 30,000 fish images stored in Hobart*

Continued from Page 1

Most museums do not have regular access to fishing vessels and gather collections from near shore.
"This is part of our natural heritage," Alastair said. "It's irreplaceable."
The collection has been used to study the strange habits of fish.
One that seems very strange indeed is the angler fish. The parasitic angler males attach themselves to the females, in some cases permanently.
Alastair said: "Many woman I have spoken to say they sound just like human males."
The unique Australian National Wildlife Collection (ANWC) at Sustainable Ecosystems was gazetted as a national institution in 1976.
It contains representatives of more than 95 per cent of Australia's bird species, 75 per cent of our mammals, 70 per cent of frogs and 60 per cent of reptiles, and a sound library that has recorded more than 60,000 animal calls.
The ANWC Travelling Wildlife Display was recently mounted from the vast resources of the larger collection and will tour around Australian capitals and regional centres over the next year.
The display illustrates the role of the ANWC and other natural-history collections in documenting and understanding our biodiversity. Visit www.anwc.csiro.au
Some CSIRO divisions are the keepers of many collections.
Some of them, for instance, that are kept by Forestry and Forest Products include the Australian tree seed collection, the N E M Walters Fungal Collection, a wood-rotting fungi collection and a mycorrhizal fungal collection.
Amongst this lot are about 20,000 seed lots that are sourced from all over the world, 4,000 fungal fruiting bodies and loads of wood-rotting fungi that is used to test wood preservatives and anti-pest chemicals.
Some of the fungi has been rotting wooden stakes in field tests for the past 35 years, but an accelerated field simulator is now able to do most of this work four times quicker.
One of CSIRO's most ephemeral collections is The Air Archive, a collection of about a hundred samples of air collected from Cape Grim in Tasmania.
These samples are used to monitor the atmosphere and to gain an understanding of the atmospheres of the past. ■





Historical account is a hit with critics and readers

The verdict is in. Fields Of Discovery is a hit with readers and critics. It has received praise from reviewers and its first edition is almost sold out. BY **MEGAN BIRD**

The idea for this book was conceived by former Chief Executive, the late Dr Malcolm McIntosh, in 1999.

Brad Collis was selected for the task of telling CSIRO's history.

He wanted to fire the imagination of ordinary people and instil in them a sense of the pioneering greatness the organisation owes its reputation to.

He interviewed hundreds of past and present CSIRO scientists and still has a cardboard box full of their taped conversations.

"I didn't attempt to do a comprehensive history," Brad said.

"I sought out the good examples."

"I wrote this for the average Australian to give them an appreciation of who scientists are, what they do, why they are important and how they effect our lives on a daily basis."

The telling of such a history is interlaced with the tales of pioneering science.

"CSIRO was set up for the good of the country and its formation was a part of the Federation debate," Brad said.

"It has its roots back in the whole reason why we became a nation, and people forget that."

The Federation debate dragged on over more than a decade but it was eventually decided that an organisation such as CSIRO was essential if Australia, so far from the economic powerhouses of Europe, was to stand on its own two feet.

The people who populated this organisation did the rest.

Brad himself came away from the endless interviews with the sense of something intangible that is rarely found in the modern CSIRO offices and labs.

He observed that while many of the scientists in their 80s and 90s were still physically and mentally fit, a larger percentage of those aged in their 70s had passed away.

He queried this and some of them referred to the fact that they were the products of a different, more holistic, educational system.

An interview with Ian McDonald, the founding Chief of the Division of Animal Production at Prospect, encapsulated something else.

Brad spoke to Ian a week before his 90th birthday.

"He said: 'If you never lose your curiosity about the world you will always have that drive for life. There are two ways to grow old. As a victim of change or as a driver of it'."

Brad said: "I found them collectively inspirational."

There was, however, a darker lesson to be learned from the old greats.

"The older scientists get distressed because that pioneering legacy is something they hold precious," Brad said.

"They spent their lives working for a pittance because of their overwhelming and collective sense of responsibility to the nation when they could have earned fortunes overseas."

Brad worked on the book, a chapter at a time, for two solid years. He struggled to sift through the thousands of hours of conversations and remain true to the task. He admits to being on the verge of giving up a couple of times.

But he says now: "I could do it all over without a hesitation."

The task was too weighty to dismiss.

"We are world leaders in science and have been for half a century," Brad said. "The tragedy is that Australians don't realise this."

The United States, Brad is fond of quoting, spends almost 3 per cent of its GDP on research and development, compared to Australia's miserly 0.6 per cent.

"We as a nation need to get a bit of a wakeup call that these scientists are doing it, but they're doing it tough."

"For the young scientists today who have all the pressures of keeping their jobs there is a lot of inspiration to be drawn by looking at the rocky roads the previous generations went through."

It is a history Brad hammers home.

Australia in the 1950s was the promised land for war-riddled scientists. The wartime restrictions on science in Britain and the United States took a long time to be lifted.

"Australia was saying: 'Come here. We're busting to get moving'," Brad said.

Alan Walsh was one British import who welcomed this opportunity.

Walsh had developed during the war a method for analysing metals using flame-emission spectroscopy.

He had used this to analyse wreckage from downed German aircraft so the quality of the metal could be used to gauge how much trouble Germany was in.

This had made Walsh famous in his field. But allied victory in 1945 threw a blanket over his efforts.

"Walsh joined a procession of similarly disaffected wartime scientists to Australia," Brad wrote.

"Over the next few years these young men would take Australia to the forefront of radio astronomy, avionics, weather forecasting, new textiles and food-manufacturing technologies, modern agriculture, and in the case of Walsh (and many notable others), new metallurgical processes."

The tales of innovation and determination that Brad skillfully weaves are just as relevant to our future and they have been to our past.

"People who work for CSIRO now belong to an organisation that has been fundamental to the development of Australia as a nation and as a society," he said.

Pioneering work: *Peter Colman from the Division of Protein Chemistry explained his flu-protein, neuraminidase, model to Frank Macfarlane Burnet in the 1980s (1).*

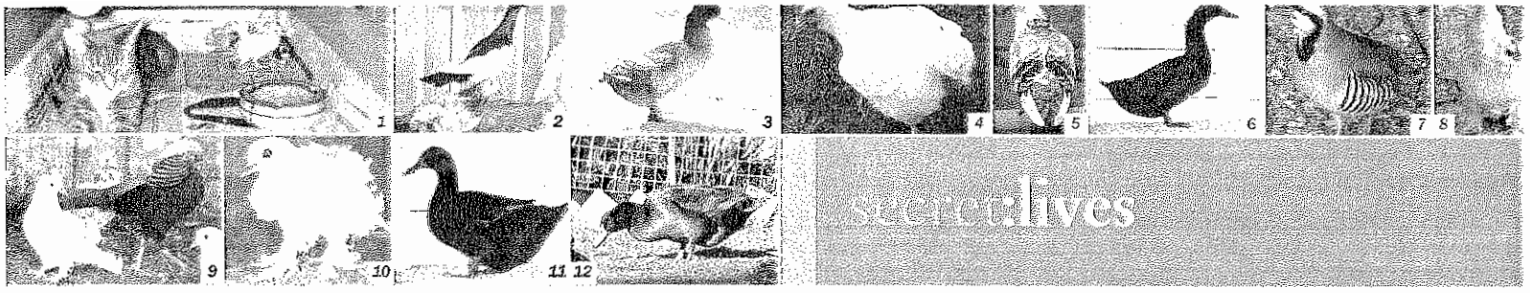
Weighty task: *It took Brad Collis two years to write Fields Of Discovery (2).*

The best of British: *Alan Walsh developed the technique of atomic absorption spectroscopy in 1952, one of the most significant advances in chemical analysis last century (3).*

*"Journalist Brad Collis's long, heavy book swiftly catches hold...the stories are extraordinary."- **Weekend Australian***

*"There's much to admire, too, about Brad Collis' concision and aversion to gee-whizzery. His emphasis is on science, which means that he skirts issues of politics (in particular Canberra's vandalism of CSIRO over the past 15 years) ... But there is ample human foible to go around..."- **Bulletin***

*"This is a landmark book...That CSIRO has had striking successes and made abundant contributions to Australia's development and life across its history can no longer be denied..."- **The Canberra Times***



Managerie: *Bently the cat competes for heat with the chicks (1), teen magpie and blue frill (2), blue Cayuga drake (3), Blanche the chicken (4), blue Birmingham pigeon (5), Cayuga drake (6), Chukkar partridge (7), Porcelaine hen (8), pheasant among the frills (9), young pure white hen (10), winning Cayuga duck (11) and blue drake (12)*

Fowl obsession

Sharon Kennedy-Miles is away with the birds every morning, afternoon and for long periods on weekends when she is not working as a technical assistant at Food Science Australia. BY **MEGAN BIRD**

She is known variously to her friends and colleagues as "vet girl", "the duck" or "chook lady", "Aunty crazy Sharon" by her niece, and "Mrs Harry Cooper" or "Mrs Burke's Backyard" by her tolerant husband.

She is unapologetically obsessed by all things poultry.

Sharon has loved birds since she was a child, and has never grown tired of them.

She has even begun writing a book about keeping poultry in suburbia for other poultry lovers.

"Poultry are ideal for the average backyard but, sadly, the keeping of birds is slowly dying out," she said.

Sharon keeps a motley crew of rescued birds herself, as well as her rare breeds.

She has an ex-battery hen with a broken hip that nobody ever noticed or treated, a golden pheasant with a crumpled foot who can only walk on his outside toe and a one-winged galah that was hit by a car.

Birds, it seems, appear to find her.

One literally fell out of a truck recently and narrowly escaped death outside Food Science Australia (FSA).

Blanche, as Sharon named her, was a meat chicken who literally fell off the back an Ingham's chickens truck last year on her way to the abattoir.

"The truck takes a sharp turn outside the FSA gate, and that's where it happened," Sharon said.

Two FSA staff found the frightened but unharmed chicken and took her to Sharon.

Sharon said: "She cheated Colonel Sanders and died happy with all her friends."

Sharon is on direct dial at the RSPCA in Brisbane, and receives dozens of phone calls a year from desperate bird owners with problems.

"I'm the informal Brisbane poultry advisory service," she joked.

She received a recent call from a lady who, according to Sharon, had called vets "who didn't know" and a hatchery "who didn't care" about her chickens that had begun pulling their own feathers out.

Sharon quickly diagnosed the problem.

"They were bored," she said.

Her recommended treatment ranged from scattering their feed into straw so they would have to work a little harder to find the grain, as they would in the wild, to hanging bunches of green feed from the pen's walls so they would have to jump for it.

It worked, and the feathers grew back.

Sharon talks about her poultry in the same way a mother would speak of her children and, if you will excuse the pun, she is just as clucky.

"I don't want kids," she said. "I've got enough."

Confessions of a poultry breeder

Two of Sharon Kennedy-Mile's rare-breed birds won best in their breed at the Brisbane Royal Show in August. She explains why she spends hours each week looking after them and why this does not feel like work. BY **THE DUCK LADY**

"When I was a child no-one in my family was even remotely interested in poultry, apart from the sample that appeared on our dinner plates on a weekly basis.

"To their credit my parents never batted an eyelid when I bought home 31 day-old chicks to rear. They were the result of our Year 11 biology imprinting experiment.

"Coming home from school was always memorable, as the sight of 31 white leghorn cockerels pounding across the yard to greet me was a daily occurrence.

"Times have changed, but I have retained my love of birds.

"My Cayuga ducks are my pride and joy, and have won me some great awards over the last four years, but they just keep getting better with each new generation.

"In the past, some nongs decided to cross-breed them with another bigger breed of duck to get larger offspring. Sure, they got larger birds but, in the process, introduced a number of undesirable features.

"My breeding program aims to rectify the stuff ups of the past impatient breeders in order to retain the size of birds and improve on the colour by selective breeding.

"I love the birds for what they are and even the show team are allowed to play in the mud if they want because they are ducks first and show winners second.

"Two of my best ducks appeared on the cover of the Australasian Poultry Magazine this July, the poultry equivalent of getting their pictures on the cover of Rolling Stone."

Ducky domain

Sharon does eat some poultry, but never ducks.

"There is a saying amongst the poultry-breeding fraternity: 'Breed from the best and eat the rest'.

"However, I can't bring myself to eat ducks," she said. "Ducks are people."

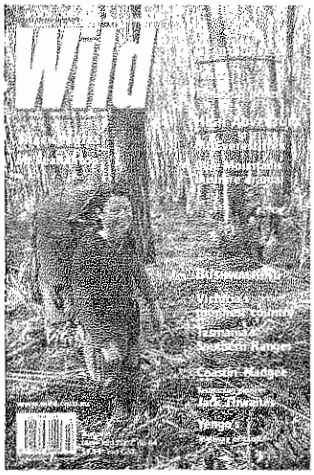
Sharon's menagerie of assorted poultry is mind-boggling.

She is able to keep about 50 pigeons, thanks to a law that was never repealed after the wars. It states that ordinary Australians are entitled to keep as many pigeons as they like as long as they are prepared to surrender them up in times of war to send and retrieve messages.

Sharon was slightly overstocked in other departments when I spoke to her during the Brisbane Royal Show. But many of her birds were travelling to new homes once the show finished.

Here's a stocktake of what Sharon has in her backyard:

• three bronze turkeys and baby poults hatched in an incubator • seven chickens of various breeds and ages, some of them with permanent pre-existing injuries • a trio of blue Cayuga ducks: This is a rare colour variety kept by only three other known breeders in Australia. Sharon is lobbying to get these ducks accepted by other breeders as a colour variation. • 16 black Cayugas, Sharon's "show team" • eight Saxony ducks, another rare breed • three Porcelaine Belgian D'Uccle bantams • two aviaries full of frill-backed pigeons and another full of magpie and Birmingham roller pigeons • two RSPCA rescue chickens, one of which is mothering five chicks.



Going bush

Geologist Kim Ely made the cover of a recent edition of the outdoor magazine, Wild, and her Chief, Professor Neil Phillips, was featured on an inside page.

The photograph of Kim, from Exploration & Mining, was taken while she was walking in the Victorian alps with a freelance photographer friend.
Exploration & Mining's Chief Professor Phillips was featured on an inside page of the same edition.
Neil, it seems, is one of three inventors of the sport of rogaining and the International Rogaining Federation President.
"Rogaine" is a combination of the names of the inventors of the sport, Rod, Gail and Neil.
Rogaining is a long-distance cross-country navigation sport in which participants collect points when they visit checkpoints within a set period, usually from six to 24 hours.

Robotic war against exotic disease

Robots will be employed in Geelong in the fight against Foot-and-Mouth disease (FMD).
In the wake of Britain's FMD outbreak the Federal Government has allocated $1 million to CSIRO's Australian Animal Health Laboratory (AAHL) to upgrade its FMD testing capacity with the installation of robotic systems.
The FMD outbreak cost Britain £5 billion in agricultural losses, according to British scientists, and more than £5 billion in lost tourism.
A worst-case outbreak in Australia would cost between $8 and $13 billion of GDP and the consequences would be felt for a decade, according to industry estimates.
The strain that swept Britain infected all cloven-footed animals. The spread of FMD in sheep during that outbreak greatly increased the number of samples that were submitted for laboratory testing.
AAHL's Laurie Gleeson said: "Our capability to quickly and accurately diagnose the first case of FMD has been high, but we recognised after the British experience that we could do more to prepare for a long-running outbreak."
The manual processing of FMD samples is extremely labour intensive, but the robotic systems will help process samples.
This funding injection will be used to purchase and operate two robots, some adjunct equipment and an information-management system.

Dining development

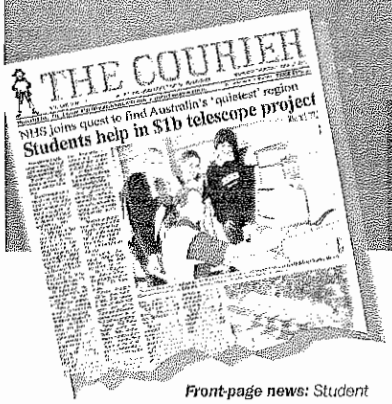
A pilot mentoring program that involved dinner after work has proved so successful the participants have decided to continue it.
The pilot, set up by CSIRO People Development, involved groups of one chief and between eight and 10 staff.
The groups, which met for about a year, were made up a range of professionals from different functional areas.
They explored topics chosen by members of the group and shared knowledge on how different divisions operated.
The meetings continued on an informal basis over dinner.

New board quartet

The CSIRO Board has four new members.
Professor Suzanne Cory, Mr Peter Duncan, Dr Ed Tweddell and Dr Terry Cutler have been appointed for the next five years.
Professor Cory is the director of the Walter and Eliza Hall Institute of Medical Research in Melbourne and last year became the first Australian to win the UNESCO Women in Science Award.
Mr Duncan, recently retired Chairman and Chief Executive of Shell Australia, worked for more than 35 years in finance and management positions. He is a director of the National Australia Bank, Orica and GasNet.
Dr Tweddell has 25 years' experience in the international pharmaceutical industry, has been Managing Director and Chief Executive officer of FH Faulding & Co and has been a member of the Prime Minister's Science, Engineering and Innovation Council.
Dr Cutler is the principal of Cutler & Company, a Melbourne-based consultancy to the ICT sector.
They replace outgoing board members Professor Mary O'Kane, Mr Norbury Rogers, Mr John Gandel and Mr Russell Higgins.
The board is made up of the part-time Chairman, Ms Catherine Livingstone, eight part-time members and the full-time Chief Executive, Dr Geoff Garrett.

Rocket-propelled birthday

CSIRO Education in Victoria was not content to let its 20th anniversary pass with a simple birthday cake.
Its rocket-propelled celebrations incorporated a symbolic rocket launch of new premises and an entertaining reflection on the 700,000 students who have enjoyed CSIRO Education's programs over the past two decades.


THE COURIER

NHS joins quest to find Australia's 'quietest' region

Students help in $1b telescope project

Front-page news: *Student participation in the project made the front page of Narrabri's The Courier.*

Students search for quiet

Countless parents would consider them an unlikely choice, but high-school students are helping to find the quietest places in Australia.

What they come up with will have a bearing on whether Australia becomes the home of a $1 billion radio telescope, the Square Kilometre Array (SKA).

The site for the SKA will be chosen in 2006, and Australia is a leading candidate to host the radio telescope.

CSIRO's Australia Telescope National Facility (ATNF) is a large player in Australia's bid to build the telescope in 2010, and is coordinating the student search for radio-quietness.

The SKA will have a collecting area 100 times larger than the world's largest radio telescope.

Narrabri High School is one of a handful of schools that is helping to measure the background levels of radio-frequency radiation in their neighbourhoods.

Each school involved is being equipped with $3,000 worth of equipment to carry out the investigations, including a radio-frequency receiver, an antenna and a laptop with the necessary software.

Schools will use an email newsgroup to communicate with scientists and other schools to compare results and suggest further experiments.

Visit www.searfe.atnf.csiro.au ■

Drugs from bugs

Small molecules from insects are being harnessed to synthesise drugs in a world first.

CSIRO recently announced the establishment of the company dedicated to discovering and developing a wide variety of therapeutic drugs, Entocosm Pty Ltd.

The team behind the enterprise was advised to establish the company first before approaching the capital markets.

Project leader Dr Stephen Trowell, from Entomology, said: "There has been very significant financial interest in the project."

CSIRO is the initial 100 per cent shareholder in the company. Financing is scheduled to open in September.

"CSIRO regularly licences out technology and there are many situations where this is the right thing to do, but we generally lose the opportunity to participate in the growth of the company," Dr Trowell said.

Entocosm is in early-stage discovery. "Small-molecule drugs from insects is a scientific area that nobody's ever looked at on this scale," Dr Trowell said.

There is a rich pool of potential sources of drugs with more than four million insect species on earth.

Entocosm has taken out a patent on molecules from termites that kill bacteria and are a potential source of anti-bacterials.

An exciting range of next-generation drugs targeted at infections prevalent in hospitals are in the discovery phase.

"There are very few radically innovative drugs that are targeted at infections that kill people in hospitals," Dr Trowell said.

The drugs the company is seeking from insect sources would, for example, be potent and specific to multiply resistant Staphylococcus aureus or Golden Staph.

Dr Trowell, the company's only employee and 13-year veteran at CSIRO, draws inspiration from the use of insects by some of the world's most ancient healing systems.

"One of the things that sustains me is the traditional use of insects," he said.

He pointed to the fact that Chinese medicine had documented the use of insects over a thousand years, and Indian Ayurvedic and Korean medicine traditions also had long histories of insect use.

"While we're not specifically following up traditional-medicine leads these precedents give us an external validation of the approach," he said.

Dr Trowell, a molecular biologist by training, has been fascinated by insects since he was a boy. He raised caterpillars, grasshoppers and ants in order to observe the biology and physiology of insects. ■

Mine waste to generate clean power

CSIRO technology will generate electricity from waste coal and gas that would otherwise have polluted the atmosphere.

THE CSIRO-Liquatech hybrid coal and gas turbine system has the potential to significantly reduce greenhouse gases and save mining companies money.

The 1.2 megawatt hybrid coal and gas turbine system harnesses existing technology to burn waste coal and methane. This generates electricity that can be used to power the mine's operations or be returned to the grid for general consumption.

It is estimate that emissions from underground coal mines contribute about 5.7 per cent of the total 6.7 per cent of Australia's annual greenhouse emissions attributed to coal-mining operations.

This project aims to slice greenhouse emissions by two-thirds over the next two decades.

It will be trialed in New South Wales next year. ■

O caption:my caption

Last issue's photograph was of a foolhardy research team that had broken down in Estosha National Park in Namibia next to a sign warning people to stay in their cars. The researchers pushed the vehicle out of trouble and were 700m down the road when they spotted a pride of eight lions.

Michael Doherty from Sustainable Ecosystems: Being pedants, the CSIRO scientists did not believe that the sign applied to their vehicle. Unfortunately, lions cannot read.

Don't worry if there's a tiger in the tank, you'll get a lion up the bum if you don't hurry up!

Albert Trajstman from Mathematical and Information Sciences: Now let's see if I've got it right. If I can kick that rock into the open bonnet and hit your head I score a goal?

A feral-hungry Afri-car claims another victim.

Richard Sakurovs from Energy Technology: I was told to come here to get lionized.

CSIRO mathematicians find the end of the lion.

Jane is demoted from spear carrier to spoor carrier.

Graham (Joel) Bryant from Mathematical and Information Sciences: Well, I've looked everywhere, and I'm buggered if I know where the smell of the cat shit is coming from.

And the winner is **Warrick Glynn from Health Sciences and Nutrition:** It was a "no brainer" really. Stay in the car with the division's commercial manager or face the lions?

Warrick wins a butterfly poster from Double Helix. ■

This issue's photograph is of Bernadette Blencowe from Member's Australia, John Woodland, formerly of CSIRO Education, and John's diamond python.

The trio was celebrating the first birthday of Science by Email at a party at CSIRO Discovery in Canberra. Science by Email is a weekly newsletter for children. It features science news, features and activities. Subscription is free. Visit www.csiro.au/sciencemail

CoResearch would like to especially thank this issue's contributors, many of whom responded to an extraordinary appeal for captions. CoResearch has taken the hint and will publish larger photographs in this section in future.

Send your captions and photographs to CoResearch Competition, PO Box 225, Dickson, ACT, 2602 or email Karen.Robinson@csiro.au ■

the last:word

"You might well ask who isn't 'retired' at CSIRO these days. There can't be many senior, long-term employed scientists who get within cooee of the magical 54 years and 11 months ... who aren't voluntarily retrenched, only to return the next day on their accrued leave and then their superannuation pensions continuing to do the quality science that distinguished them in the first place..."

-The Canberra Times, July 7

"...John Howard launched ... Fields Of Discovery and told the audience he looked forward to the day when the CSIRO could join the Australian cricket team as world leaders. Fine sentiments. But since the Coalition took office... CSIRO has lost 12 per cent of its staff ... [and] a quarter of its budget relative to economic growth."

-The Age, July 6

"The widening gap between the minority with access to modern scientific knowledge and technologies and the vast majority of people lacking access is a threat to future global stability."

- Border Watch, August 8, on Julian Cribb's new science-communication book, published by CSIRO Publishing

"...Garrett is trying to redefine the 6500-strong agency from Commonwealth monolith and cloistered academy into a 'porous' multi-disciplinary network with many linkages to industry."

-Financial Review, June 18

"The Gold Coast City Council has granted its $300,000 contract for toilet paper to a company which won a CSIRO 'strength test'."

- Gold Coast Bulletin, June 12

CSIRO

co:research

CSIRO'S STAFF MAGAZINE NO. 393 DECEMBER 2002

THIS ISSUE

Official webcast will feature eclipse

Mounting CSIRO's first external webcast is a rite of passage for amateur astronomer, CSIRO Education's Darren Osborne. The webcast on December 4 will showcase Australia's first total solar eclipse in 28 years. BY **MEGAN BIRD**

Darren was living in the Melbourne under the eclipse path on October 22, 1976, when the sun last disappeared. He hid under his mother's coffee table and missed it.

"There was a level of paranoia, even as recently as then," he said.

"I was five years old and spooked out of my mind.

"I missed it completely and promised myself I would see the next one."

Darren and a team of CSIRO IT specialists have spent months preparing for the webcast.

"It would have been a lot easier to have just taken a few days off and go and view it by myself," he admitted.

"But I wanted to cover it for The Helix magazine and leverage some promotion for CSIRO out of it."

It is a lot of effort to go to for 31 seconds of totality but thousands of people around the world are expected to view it.

The Ceduna council has recognised CSIRO as the official eclipse webcaster.

Darren said: "We cornered the market."

BBC Online and the Exploratorium, organisations that usually webcast total eclipses, will not cover this one because of its short duration and remote location.

CSIRO's web coverage will last 45 minutes and include expert commentary and interviews with locals and some of the 15,000 people who will descend on Ceduna in South Australia for the event.

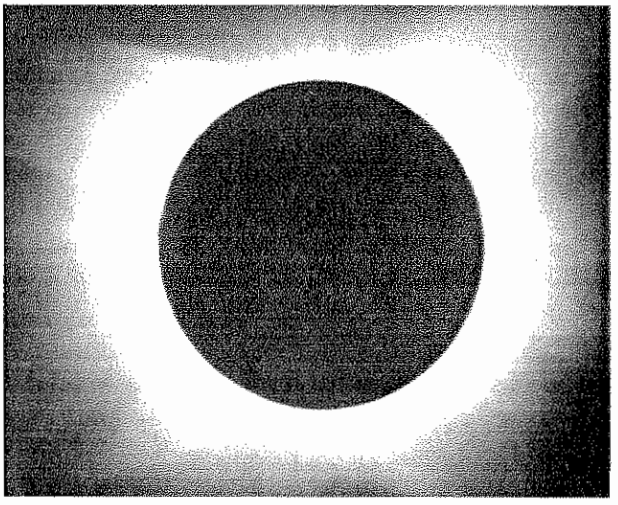
Ceduna has a population of 3,000, and is 900km north-west, or nine hours drive, from Adelaide.

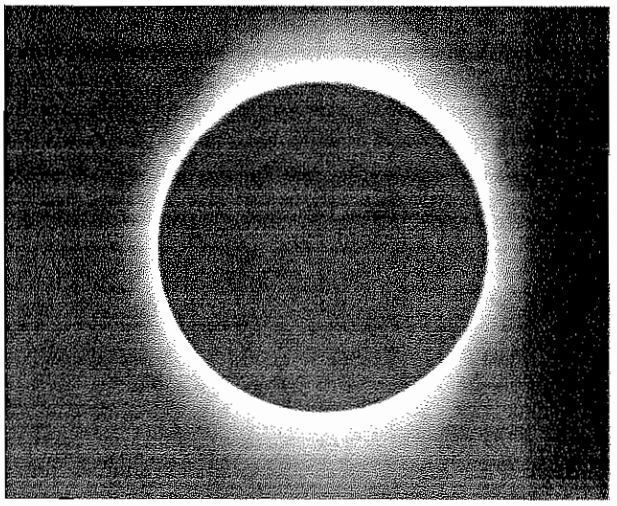
It will be transformed into a tent city for a few days.

One legacy of the eclipse will be the elaborate public toilets that have been upgraded for the event at a cost of thousands of dollars.

Another is a website that will record the experiences of some witnesses to the eclipse.

Read about these experiences at www.csiro.au/eclipse ■





Chasing the sun: *eclipse hunter Mick Wolf took these photographs that highlight the normally invisible corona of the sun during total eclipses in Java in 1983 (top right) and India in 1995 (bottom right).*

Physics envy sparked a career

The self-coined concept of "physics envy" was a determining factor in why Dr Cathy Foley became a physicist. BY **MEGAN BIRD**

Cathy, from Telecommunications and Physics (TIP), was almost intimidated into thinking physics was not for her.

"I thought you had to be Einstein's cousin to be a physicist," she said.

Cathy came from a family of businesspeople. The only physicist she knew fit the archetypical boffin mould.

"I just thought it was outside my potential," she said.

A party in the first week of second-year undergraduate science tipped the scales. The physics department held a barbecue at a lecturer's home and Cathy had a memorable time.

"It sold me that physics was a very social subject," she said.

Cathy had fostered a love of physics since high school.

"Physics was a cult in my school, and I was the leader of the cult," she said.

Cathy's Year 11 physics teacher, Barry Price, was trialing the revolutionary Harvard Projects Physics program at her school.

"It was the first step in moving on from the dry way of teaching physics," Cathy said.

"It taught us that physics could change the world and I wanted to be part of that.

"If I had done the more traditional program I don't think I would have been so turned on."

Despite this, Cathy lacked confidence by university in her ability and had toyed with the idea of becoming a science teacher.

"I really liked science in general," she said. "I could have gone in any direction."

That legendary barbecue enabled Cathy to imagine that she could fit into the university physics scene.

Her own perverse determination did the rest.

"I call it physics envy," she said. "it's really hard so it's sort of cool."

Cathy works on magnetic-field detectors, and has been a physicist at CSIRO for 18 years.

Statistically she is part of about 7 per cent of physicists at TIP who are women.

"That's a pretty standard percentage across the industry," she said.

CSIRO is the most trusted on biotechnology

Australians consistently rank CSIRO as the most trustworthy source of information on gene technology and biotechnology.

About 85 per cent of Australians had the most confidence in CSIRO as a source of information on biotechnology, according to a 2001 survey.

Respondents also preferred information from schools and universities (82 per cent), scientists (75 per cent), and environmental organisations (70 per cent).

They had the least confidence in information from the media (42 per cent), industry (39 per cent), the federal government (29 per cent), state governments (27 per cent), and religious organisations (22 per cent).

CSIRO again topped the bill as the most trusted source of information in a 2002 survey, according to two-thirds of the 1,000 respondents. Next came doctors (60 per cent), scientists (44 per cent), and Biotechnology Australia (39 per cent).

The least trusted sources of information were the media (34 per cent), Greenpeace (20 per cent), and industry (16 per cent).

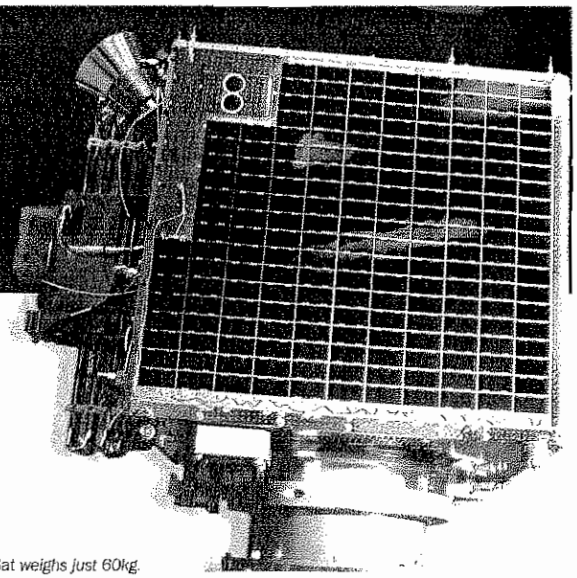
CSIRO was described during one study as one of the most trustworthy sources of information on gene technology and biotechnology at all phases of the research.

The reasons given for this by respondents were CSIRO's longevity, its financial and political independence, its expert knowledge and its track record in providing reliable and balanced scientific research and information. This focus-group study aimed at determining deeper attitudes was a follow up to the 2001 survey.

The results from these surveys, which spanned from 1999 to 2002, were presented to a Brisbane conference in October by Biotechnology Australia's Public Awareness manager Craig Cormick.

First Australian satellite in over three decades

The first satellite to be built in Australia in 35 years, FedSat, will be launched from Japan on December 14.



Countdown: *FedSat weighs just 60kg.*

The experimental satellite will demonstrate Australia's capability to design, build and operate small satellites. It has provided a rare training ground for young engineers and scientists to develop their skills in satellite technologies.

FedSat will carry advanced-communication, space-science, navigation and computing payloads on its three-year mission.

Three of the six main payloads on board have been developed in Australia by the Cooperative Research Centre for Satellite Systems (CRCSS). One of them will demonstrate broadband high-speed systems for the first time from a low Earth-orbiting spacecraft.

CSIRO is the managing agent of the 12-partner CRCSS based in Canberra.

CRCSS Executive Director, CSIRO's Dr Brian Embleton, said: "This will generate an R&D program to future proof the delivery of broadband services to rural and remote areas."

Other satellite features include a high-performance computing payload that could pave the way for a new species of spacecraft that could fix and modify their own circuits.

Japan has agreed to launch FedSat in return for data from the GPS receiver and the NewMag magnetometer. NewMag is a sensitive and rapid-sampling device for measuring the strength of the Earth's magnetic field.

FedSat will be launched from Tanegashima Space Center by the National Space Development Agency of Japan (NASDA) on its H-IIA rocket. H-IIA will also piggyback Japanese payloads into orbit.

Almost 40 satellites have been successfully launched from the centre since 1975, but FedSat will be the first foreign satellite launched on the H-IIA vehicle.

Dr Embleton said: "NASDA will gain an understanding and practical experience of the challenges of providing launch services for clients' payloads."

FedSat, a 58cm cube, has taken four years to build and weighs just 60kg.

CSIRO has invested about $1 million a year in-kind support in the project since 1998. ■

CSIRO outperforms counterparts in commercialisation stakes

CSIRO outperformed US and Australian university averages in commercialising its science in some areas, according to a recent national survey.

CSIRO Business Development and Commercialisation's Dr Andrew Pik said: "For the first time we have comparable data and it shows we stack up pretty well.

"We're not nearly as bad at commercialisation as we often get criticised for being."

CSIRO outperformed comparable Australian and US organisations in patent and licence rates, income this generated and in the number of start-up companies it formed.

CSIRO executed 294.2 licences for every US$1 billion in research expenditure it spent in 2000-2001. This was more than double the rate of those executed by academic institutions in the US, with 143 licences; Australian universities, with 115.4 licences; and many times the 20.6 licences executed by Federal Labs in the US. Federal Labs, which is comparable to CSIRO, includes organisations such as NASA and the Department of Energy.

CSIRO was issued with 71.8 US patents for every $US1 billion in research spending. This was more than double the 34.3 patents issued to Australian universities, more than the 56.2 patents issued to Federal Labs, but well less than the 127.9 patents issued to US academic institutions.

When it came to converting patents and licences into revenue CSIRO did four times better than Federal Labs in the US. CSIRO received $12.5 million in adjusted gross income from licenses for every $US1 billion in research, compared to just $3.1 million for Federal Labs. Australian institutions performed better than this at $31.6 million, thanks to the one-off sale of Melbourne IT. When this sale is excluded CSIRO outperformed Australian universities by $1.9 million. Academic institutions in the US received $44.9 million, a figure that was again skewed by several blockbuster businesses.

Dr Pik explained: "The only institutions that do exceptionally well out of licensing are the ones that have a blockbuster.

"CSIRO has not yet had a blockbuster."

On a micro level, however, some of CSIRO's divisions are punching above their weight.

The traditional average income from licensing is a return of 4 per cent of an organisation's R&D budget, according to Dr Pik.

CSIRO's Plant Industry more than doubled this average with 10 per cent income. CSIRO's Manufacturing Science and Technology and CSIRO's Textile & Fibre Technology generated about 5 per cent each.

CSIRO formed almost double the US rate of start-up companies at 22.8 per $US1 billion. Academic institutions in the US formed 13.8, and universities in Australia formed 16.2.

There were, however, some strong individual university performers. Sydney University, for instance, had more start-ups than CSIRO and generated more licence income.

Dr Pik said: "For the first time we have a baseline.

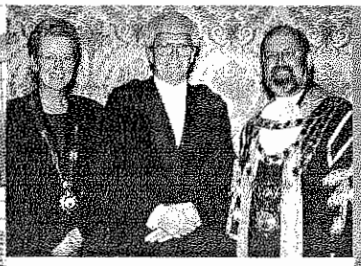
"We would like to do a hell of a lot better, and we're on the road to achieving that, but CSIRO is already performing well on a relative scale."

The 2000-2001 data was drawn largely from the report of the National Survey of Research Commercialisation undertaken by the Australian Research Council, CSIRO and the National Health and Medical Research Council.

The report also contains the case studies of some CSIRO commercialisation success stories. It can be viewed at www.arc.gov.au ■

Colourful former deputy mayor goes back to the lab

Pru Bonham has dyed her hair purple and is planning to get a tattoo now that she has left the grey-suited ranks of local government. BY **MEGAN BIRD**



Committed member: *Prue Bonham has retired from 12 years in politics.*

She has served as Deputy Lord Mayor of Hobart since 1994 and on the Hobart City Council since 1990.

She also worked four days a week at CSIRO Marine Research as an algal biologist during those 12 years.

"The other four days a week in local government," she quipped.

Pru has always been a colourful character.

"I am an old hippie," she said.

"I remember being barefoot and pregnant in the '70s, travelling around Queensland in a blue car with flowers painted on the door."

Pru, 54, was just as colourful when she retired from local politics.

She issued a parting swipe to state politicians, who refused to consider a recent claim by aldermen for higher allowances.

"Senior government ministers sat and sniggered while Hobart aldermen were explaining their workload," she said.

"The work councillors do is not valued," she said. "And there's some fantastic people in local government."

Pru, herself, was not paid for her first four years in government. A small wage was attached to her deputy position, but it was not superannuated and much of it was taken by the taxman.

"While noone is in it for the money I believe there will never be a truly diverse representation until representatives can go in there and earn a decent wage," she said.

Pru is well-known for her commitment to the environment, bushland management and to youth programs.

Some of her fondest memories in politics are of seeing youth from difficult backgrounds return to school and matriculate.

During one such graduation ceremony four former drop-outs were given a standing ovation for overcoming their circumstances.

"Everyone was just about in tears," Pru said.

Being a driver of environmental change has been another of Pru's greatest satisfactions.

Pru cites the fact that council is on track to slicing its carbon dioxide emissions by 70 per cent by the end of the year, thanks to some innovative council projects.

Council decided to relocate the Sandy Bay sewage-treatment plant in the mid-'90s after concerns that raw sewage was being pumped into the estuary.

Sewage is now pumped up to a tertiary-treatment plant and used to irrigate sporting fields and war-memorial grounds on the way back.

The geothermal energy generated by the pipeline journey is used to heat two retirement homes, the Hobart Aquatic Centre and Federation Concert Hall. The water is near drinking quality by the time it is released.

"Sometimes council seems to move very slowly," Pru said. "But when you think of the giant strides taken in 12 years it has been worth it."

Pru is back at CSIRO full time as a senior technical officer.

"My managers have been very flexible and supportive of my career in politics," she said.

"I'm hoping to contribute at CSIRO for as long as I can."

"There's joy in science," she said. "There's a lot of satisfaction in local government but precious little joy."

One of Pru's biggest joys at CSIRO is working aboard boats on field trips.

She is a little obsessed with boats. She can, for instance, see container ships from her office, and sometimes runs down to the wharf for a close-up peek when they dock.

Pru's retirement from politics means she will have Sundays free from reading council agendas, and she has begun walking to and from work.

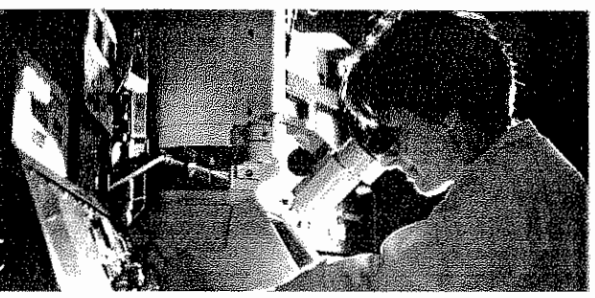
"Sometimes the time constraints are just as squeezed at CSIRO, but I'll be concentrating on one job instead of two," she said.

Pru also plans to put her media experience to good use, helping a group of peace-activist friends.

"The one thing I've learnt from local government is to never forget your roots. I'm planning to go back to them now," she said.

Pru, it seems, is also an old salt. When asked what sort of tattoo she would get she answered promptly: "A little ship, of course. Perhaps a galleon."

Flagship budgets about to be set



CSIRO is engineering one of Australia's most ambitious scientific programs, the National Flagships Program.

The flagships have bold multi-billion-dollar goals aimed at harnessing national resources to tackle some of Australia's most pressing problems.

Dr Graham Harris said: "We want to help Australia gain a competitive edge on the rest of the world in some areas and give the country the critical mass and skills to grasp opportunities."

Flagship goals are being established after extensive consultation with governments, community leaders and research partners.

Dr Harris said: "CSIRO is the architect, but we're just putting the flagships together on behalf of the country."

The budgets for the first flagships are about to be decided, and divisions will make an investment in them in 2003-2004.

The flagship program will eventually involve between 30 and 40 per cent of the organisation's resources.

CSIRO workshops and cyberseminars have been held around the country to explain the workings of flagships to staff.

"The flagships are aimed at improving the lot of all Australians by extracting the synergies that exist across CSIRO and in organisations around the country," Dr Harris said.

The flagship bureaucracy will be kept to a minimum.

"It's not going to be another bureaucracy to rival divisions," Dr Harris said.

Each flagship will have an advisory committee that will give them direction. And work contracts will be signed between flagship directors and divisional chiefs. Decision-making will be a consultative process between directors and chiefs.

Dr Harris said: "There will be no unilateral decisions."

Seven flagships have been proposed.

PREVENTATIVE HEALTH

Longer and healthier lives

"How do we put more emphasis on preventative health? You look at typical departments of health and they're not departments of health. They're departments of illness."

- CSIRO Chief Executive, Dr Geoff Garret, National Press Club Address, November 6

A small decrease in chronic disease will lead to large and diverse benefits for Australia.

This well-advanced flagship aims to extend the productive lives of Australians by 10 years, cut health-care costs and increase knowledge exports. The estimated economic benefit of this could be up to $5 billion a year.

Professor Richard Head said: "We're helping Australians live longer and healthier lives."

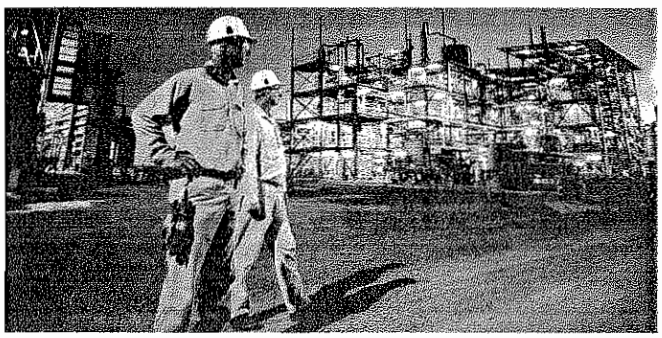
The first two flagship initiatives will be a national infrastructure for the integration of health data and a focus on colorectal cancer. The flagship focus will be applied to protective foods, diagnostics and at the interface between science and society.

This flagship will involve up to nine CSIRO divisions and partnerships with many external institutions.

"We're looking at reducing the burden of disease, decreasing the costs wherever possible, and capturing the opportunities to create knowledge, useful products and practical approaches to help prevent diseases," Professor Head said.

A series of lifestyle diseases has been identified and early-intervention strategies and early-detection methods designed.

"We're integrating data and technology and looking for new opportunities to intervene," Professor Head said. "And we have a strong interest in developing and commercialising health products."



LIGHT METALS REVOLUTION

Working in agreement

This flagship aims to lead a global revolution in light metals. It plans to raise $5 billion more a year in revenue by 2010 while halving the environmental impact and reducing the energy it takes to produce light metals by 30 per cent.

This vision is supported by a recent Federal government action agenda.

CSIRO's Dr Rod Hill said: "It was one of those wonderful conjunctions."

CSIRO has been working on a project of this magnitude for about two years.

The Federal government released the Action Agenda Report, Australia Leading The Light Metals Age, in December 2001. Its main goal is that Australia increase its aluminium, magnesium and titanium exports by between 25 and 50 per cent over the next 20 years, but the flagship goes even further.

"It gives arms and legs to the overarching action agenda," Dr Hill said.

It is one of CSIRO's most advanced flagships and will involve at least

continued on next page

eight CSIRO divisions, governments, three Cooperative Research Centres and industry partners.

The aluminium and magnesium challenges will build upon technology, such as the CSIRO-developed carbothermic smelting process, that can halve capital costs, reduce operating costs, cut energy costs by 30 per cent and deliver major environmental benefits.

Australia's magnesium industry is about to emerge. CSIRO has a strong partnership with the Australian Magnesium Corporation and has been approached to form partnerships in other magnesium projects. The flagship will continue to forge these alliances and jointly create intellectual property.

Australia's titanium industry is further into the future. Australia is one the two leading titanium oxide producers, but does not yet produce the metal.

The first commercial titanium plant would return at least $300 million a year to Australia.

HEALTHY COUNTRY

An Olympic-sized effort

United purpose on an Olympic scale is envisaged to achieve the goals of this flagship.

Dr Chris Moran said: "The only thing that has come close to the planned harnessing of skills and partners we need is Australia's long build-up to be a world leader in sport, which culminated in the Sydney Olympics.

"We have one major advantage over the Sydney Olympics. Water links all our relevant issues together."

A multitude of partners and 16 CSIRO divisions would be involved in delivering these aims.

Healthy Country (HC) aims to achieve a ten-fold increase in the social, economic and environmental benefits derived from water use by 2025. The estimated benefit of this is $50 billion.

Two immediate projects would be to devise a strategy that deals with drainage of the south-west Australian wheatbelt, and irrigation in the lower Burdekin River that interfaces with the Great Barrier Reef.

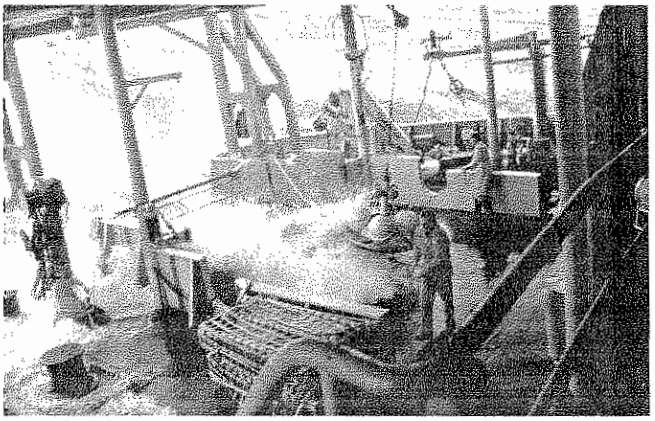
The flagship covers the water sector from irrigation - which uses about 70 per cent of water - to future water systems, urban systems that use the other 30 per cent and require the largest investment in capital and management costs.

Missed opportunities will be exploited by creating wealth from waste. This could involve encouraging an industry cluster where the waste from one enterprise could provide an input to another.

The flagship will put forward a vision for dryland landscapes that would have a new and large-scale outlook.

And it will position Australia as a future leader in designer ecosystem services.

HC has begun to build a knowledge-management strategy to prioritise investment in landscapes and cities, and achieve its ambitious agenda.



OCEAN WEALTH

One of the last frontiers

This flagship is charged with responsibly generating wealth from one of the last remaining frontiers, the ocean.

About 70 per cent of Australian territory will be under the ocean by 2004, when the UN Convention on the Law of the Sea is expected to be ratified.

Dr Ian Poiner said: "We have explored less than 5 per cent of this. "It is difficult to manage a mystery and yet the first priority for this flagship it that our environmental problems on land not be repeated in our oceans."

The estimated benefit from this flagship is $50 billion more from the industry by 2020. The goal is to confirm sovereignty over Australia's ocean territories and, in a sustainable manner, to double the wealth generated by Australia's ocean resources and enterprises to $100 billion a year.

This flagship is at an earlier stage than the other six.

"We're engaging a variety of senior stakeholders later in the year to develop a science plan and a business plan of operations," Dr Poiner said.

This will be completed next year.

The largest existing marine industry is oil and gas, which has a turnover of $8.4 billion a year. Revenues are forecast to decline here, but there are challenges ahead as the petroleum industry moves into deeper water and more hostile environments. Other marine industries include tourism ($22 billion), fishing ($2 billion) and aquaculture ($600 million).

The stuff of science fiction is already being talked about, mining beneath the oceans and finding ways to make the ocean floor suitable for human habitation. But there are more immediate prospects when it comes to new marine industries.

These industries include bioprospecting, developing environmental services for the marine environment and wave, tidal and wind energy.

"We've got a huge ocean territory that we know virtually nothing about," Dr Ian Poiner said. "We do know that it's going to be available for the generation of wealth and that we want to avoid the type of mistakes we made in developing our land-based resources."

AGRIFOOD TOP 5

Harnessing a natural advantage

This flagship builds on one of Australia's greatest natural advantages – the production of clean, healthy foods, and the knowledge, systems, products and services derived from them.

Dr Allan Green said: "We're trying to work back from opportunities and put in place the R&D programs needed to realise them."

And there are many opportunities on offer, particularly in the Asian markets. "Dairy exports have been a large success and there's more opportunity there," Dr Green said.

Other growth areas include healthy fats and oils such as the omega-3 fats, functional foods, aquaculture, differentiated grain products such as resistant starch cereals, and addressing strong demand for freshness and convenience.

The flagship's goal is to move Australia from being the world's tenth largest agrifood exporter to one of the world's Top 5. This would boost income from agrifood products and services by $12 billion by 2010.

Agrifood Top 5 is working with an action committee from six CSIRO divisions, but an operational plan is a few months away.

"We have a lot of internal ideas. We want to test them with industry and partners and seek views on where they see the strongest impact potential and opportunities for investment," Dr Green said.

E-AUSTRALIA

An untapped resource

No organisation is better placed to facilitate this flagship than CSIRO, according to Mr Gary Doherty.

"We have the expertise and understanding of the problems," he said Governments, communities, industry, other research providers and 11 CSIRO divisions will be involved in this flagship.

"What's exciting is the engagement of the other divisions," Mr Doherty said. "We are the only research organisation in the country that can combine experitse in domain areas such as agriculture, mining and health with advanced information and communications technologies (ICT).

"There's a great untapped resource there with the potential to transform sectors of the economy and position Australia favourably in the information economy."

This flagship is expected to increase national productivity and new ICT exports by more than $20 billion a year by 2010.

The next-generation Internet will underpin many of e-Australia's initiatives. It will be reliable and ultra-fast.

Mining services, worth $1.5 billion a year, are projected to be worth $6 billion by 2007. This flagship will tap into that industry to provide services such as enhanced techniques for exploration and mine productivity and safety.

The Concept Hospital will provide high-quality health services and support to health centres throughout rural, remote and urban Australia.

And Rural e-futures will deliver a range of benefits via three programs.

The Passport for Produce will serve to optimise and monitor the movement of goods.

The Smart Farm will deliver to the farmer the best information on issues ranging from cropping and weather advice to soil management.

And the Whole Smart Communities has the potential to improve the quality of life, facilitate remote jobs and transform rural areas.

ENERGY TRANSFORMED

Leading the charge

Australia has one of the most cost-effective energy systems in the developed world and an abundance of fossil fuels, but it generates the most greenhouse gas (GHG) emissions per capita in the world and is running out of oil reserves.

This flagship will resolve the dilemma of maintaining internationally competitive, reliable and secure energy services while significantly reducing GHG emissions.

Dr Peter Burton said: "We can show very strong leadership in a way that hasn't been demonstrated anywhere else in the world.

"We think we have got a strong business plan and are commercially agile enough to lead the charge ourselves."

The flagship will involve about nine divisions and national and international partners.

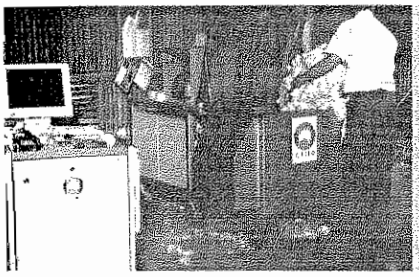
This flagship has three high-level objectives. It aims to halve Australia's GHG emission per unit of GDP to 2000 levels by 2020. It has undertaken to maintain Australia's cost effectiveness of energy services by introducing, developing and integrating emerging energy technologies, particularly in relation to power generation. And it expects to deliver about $50 billion worth of benefits to the energy industry over the next three decades.

Three technology programs will help facilitate this. Clean Coal Technologies will involve coal gasification with the ability to produce power and products such as clean fuels, combined with geological sequestration of carbon dioxide.

Distributed Energy Technologies will double the efficiency of fuel use. And New Generation Transport will make vehicle and infrastructure inroads.

The three facilitating programs are Energy Scenario Modelling, Demand-side Management and New Energy Science.

Dr Burton said: "Clearly we need to have a few more answers and it's going to take a concerted effort, but we want to contribute at least our fair share internationally." ■



Shear precision: CSIRO's Laserscan diameter measurer (left) and fleece sample preparer (right) have revolutionised the shearing shed. They can measure more than 800 fleeces a day.

Fibre technology measures up

CSIRO's revolutionary Sirolan Fleescan testing machines have been making cameo appearances at spring field days around Australia.

Textile & Fibre Technology's (TFT) Mr Bill Aspros said: "The machines are a great commercial success for the division."

They have, in three years on the market, raised almost $3 million in sales.

More than 30 of them have been sold at a cost of about $120,000 each.

The machines scour and dry fleece samples in order to precisely measure the fibre diameter of a fleece with Laserscan technology. Samples are taken at random points as fibre diameter varies across the fleece.

This helps wool handlers to objectively appraise fleeces that might have been incorrectly included in coarser bale lines.

TFT developed the Sirolan Laserscan nine years ago.

Sirolan Fleescan was commercialised over the last three years.

The Sirolan Fleescan is portable and can be used in the shearing shed at shearing time.

Mr Aspros said: "The industry was waiting for this sort of technology."

Survey makes energy count

The results of the National Kilowatt Count, a CSIRO Education initiative, are in.

More than half the households watched television for more than five hours a day, only two-thirds of homes recorded had ceiling insulation and only 7 per cent had solar hot water. This was despite the fact that householders who participated in the survey were particularly motivated.

On the positive side, about 60 per cent of households recycled most of their containers and paper products and more than three-quarters of households planted trees during the year.

More than 10,000 households across Australia took part in the household-energy use project.

The project's partner and major sponsor was the Australian Greenhouse Office. Other sponsors of the National Science Week event were Alcoa World Alumina Australia, EnergyAustralia and TransGrid.

Visit www.kilowattcount.gov.au/results.html

Outback coin makes its mark

A collector's coin that was minted using CSIRO technology sold out within weeks of issue and is worth double its original value.

The $5 Year of the Outback coin sold for $79.50. There are 15,000 of them in circulation that now have a value of about $160.

The silver coin has microscopic grooves and ridges that give a hologram-like effect to the image of the Olgas. Tilting the coin takes the handler on an outback journey from sunrise to sunset.

The coin is the second to use patented CSIRO Exelgram technology.

The first, the Centenary of Federation coin, issued last year, had a circulation of 10,000 and sold out in less than a fortnight.

Exelgram was developed by CSIRO Microtechnology

Disease-alarm research planned

Upcoming research into livestock disease-alarm systems could equip farmers with naturally disease-resistant and healthier stock. Dr Aaron Ingham from CSIRO Livestock Industries said many studies had been conducted on toll receptors in humans, but these molecules had largely been ignored in livestock.

Toll receptors provide the immune system with the first warning that a disease-causing agent is present and then initiate an appropriate immune response.

Dr Ingham's study into toll receptors in predominantly sheep, cows and pigs could have many benefits.

Analysis of an animal's genomic response to varying types of infection should lead to a better understanding of the immune system's role in resisting infection.

This process could be used to produce healthier animals by identifying genetic markers that could be used in selective breeding.

Breeding animals that naturally resist disease will significantly reduce the need for chemical interventions.

Also, the new technology could be used to improve existing vaccines and to reduce potential side-effects of immunisation by directing the immune response down the most appropriate pathway.

The research will begin in 2003, and has been kick-started by an $8,000 grant Dr Ingham was awarded as the Victorian winner of an AFFA Science and Innovation Award for Young People.

Scientists are world leaders when it comes to watching grass grow

A group of CSIRO scientists in Western Australia are world leaders in watching grass grow.

One of them, Mr Graham Donald, from Livestock Industries said: "You need a lot of computing capacity and a lot of patience."

The group has used satellite data and climatic information to build models of pasture growth rates and feed on offer for the grazing industry in the high winter rainfall area of Australia. The technology has been tested in Western Australia and is being offered free to farmers in southern Australia whose properties fall within this zone.

"There has been a lot of positive feedback from farmers, especially during these drought conditions," Mr Donald said.

Farmers can use the data, which is available via the Internet and in some cases by email, to make farm-management decisions.

Historical data can be viewed at www.pgr.csiro.au. Farmers might, for instance, be able to find a period that resembles current conditions or determine the best growth-rate times.

The data could also be used in bushfire, rangeland and biodiversity management.

The websites are www.pgr.csiro, for Western Australia, www.thefarmshed.com.au for the southern Australian Mediterranean climate zone and www.spatial.agric.wa.gov.au/foo for feed-on-offer maps.

Youngest Eureka prize winner had some CSIRO help

Matilda-Jane Oke, 14, became the youngest Eureka prize winner with some help from CSIRO this year. Matilda-Jane, from Perth, found that dust caused by mining activities does not appear to affect the growth of young eucalypt trees. BY **MEGAN BIRD**

Budding researcher: *Matilda-Jane Oke studied the effects of dust on eucalypt trees. PHOTO: The Community Newspaper Group*

"I was living alongside a dirt road in Melbourne with lots of gum trees and wondered why they thrived when the dust would have blocked their stomata," she said.

"I realised that if trees could survive dust, they could be planted to help rehabilitate mine sites."

Matilda's science teacher at Mercedes College was married to the former Chief of CSIRO Exploration and Mining, Dr Bruce Hobbs.

Dr Hobbs put Matilda-Jane in touch with CSIRO environmental scientists. They had been puzzled about why mangroves near Australia's largest iron ore port at Port Hedland had not sustained great damage.

CSIRO Exploration and Mining's Dr Peter Hick became Matilda-Jane's mentor and helped set up a glasshouse experiment for her.

"We sat down and talked it through," he said.

"She's a pretty bright kid.

"She's also doing outstanding work on frogs and she plays half a dozen musical instruments."

Matilda-Jane studied trees she dusted with iron ore for 40 days, wrote up her results, and won the $5,000 Macquarie University Eureka Schools Prize for Earth, Environment and Planetary Sciences.

CSIRO has plans to continue with Matilda-Jane's work.

Matilda-Jane acknowledges the help she received from CSIRO, her science-teacher mother, and her petroleum-geophysicist father.

"They have all influenced me," she said.

"CSIRO staff were great to work with and really helpful.

"I couldn't have done it without them.

"And I am keen to pursue environmental science or something with animals, maybe vet science."

Matilda-Jane would like to conduct a follow-up study.

"I would love to look at the insects that live on dusty trees," she said. "But I don't know if I'll get the opportunity."

Environmentally minded Matilda-Jane had to spilt the prize money with her school. She used her share of it to sponsor Dewi the bear, who has since been rescued from cramped conditions in a Cambodian zoo.

Inspiring teacher hands his win back to students

A physics teacher who gave up a university career to inspire high-school students has been funding their science prizes for years.

Mark Butler, from Gosford High School in New South Wales, recently became a BHP Billiton science teacher of the year. He used his $5,000 prize money to establish a trust fund for future science prizes for his students.

CSIRO Education's Ross Kingsland said: "This teacher was exceptional, inspiring both the gifted and those who find science challenging.

"He is the sort of teacher we should all be applauding."

Four science students also gained national recognition for winning in different categories.

The students competed against 700 entrants from around Australia to take home $1,000 each and a plaque.

Freya Ovington's award-winning project began with a hunch that the colour of netball uniforms could be used as a secret on-court weapon.

Freya, from Lyneham High School, studied colour and peripheral vision, and found that red-clad players were disadvantaged on court because they were easier to spot. The dull silver-grey uniforms sported by the national league leader, the Adelaide Thunderbirds, support her hypothesis.

Freya and her classmates performed particularly well in the awards. Three students from Lyneham High School were national finalists this year.

Ross said: "Lyneham has an extensive program that gives them that extra opportunity."

Jon Scott, from South Australia, also had an advantage, his love of music.

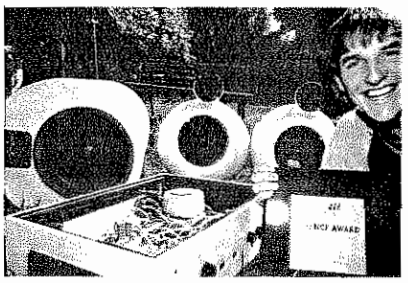
Jon, from Mount Barker Waldorf School, was awarded his prize for the spherical home-studio speaker system he constructed. Jon combined his love of science with composing and recording music.

"Musicians don't tend to know too much about the equipment they are using," he said.

Other student winners were Anne Williams from St Mary's Anglican School at Karrinyup, Western Australia, and Andrew McLeod from North Sydney Boy's High School.

The other teacher winner was John Pearce, from Maiden Gully Primary School, near Geelong in Victoria.

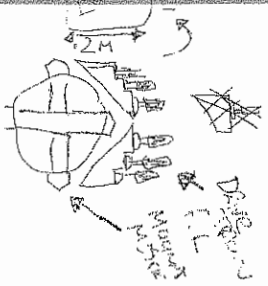
The 16 student finalists attended a three-day camp in Victoria that packed in science activities and visits to research facilities.

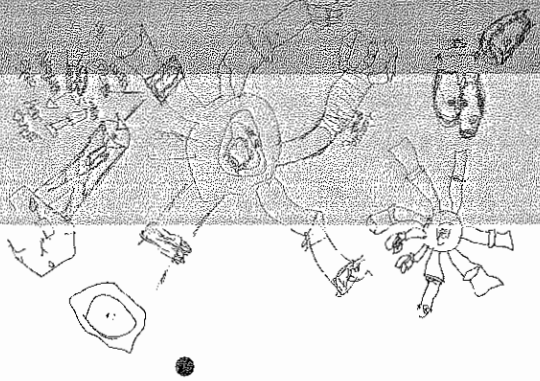


Sounds of science: *Jon Scott, from South Australia, combined his love of music and science to win one of this year's BHP Billington Science Awards. Photo: Messenger Newspapers*

CSIRO started the awards program 22 years ago and help BHP Billiton organise the camp, presentations and judging of entries. More than 20,000 students and teachers have submitted projects since the awards began.

Other partners in the awards are the Australian Science Teachers Association and QANTAS.





Agents of information

They are trained in interrogation techniques and daily hear stories about extraterrestrial travel, fuel-saving cars and perpetual motion. They are not secret agents, but CSIRO Enquiries staff at Clayton in Victoria. BY **MEGAN BIRD**

Team member Jenny Restarick explained: "We get 40,000 enquiries a year from potential commercial partners, students and others, but the most interesting ones and the hardest to deal with are from inventors."

Jenny has fielded calls from the inventor of a permanent magnetic paddlewheel for extraterrestrial transport. She referred him on to the Search for Extraterrestrial Intelligence organisation.

One 76-year-old had invested in a safety device to stop people from falling off ladders, and others wanted to patent a cough medicine and aloe vera gel that could be used on blue bottle stings.

Enquiries from people wanting to patent inventions are so common that a form letter with the contact numbers of relevant associations and government agencies has been developed.

Jenny regretted having to tell the inventor who wanted to desalinise bore-water that CSIRO did not have the resources to patent and commercialise other people's ideas. She was, however, able to give him contact numbers that might be able to help him. She also explained the patent process to him.

"He started off frustrated. Inventors often get frustrated because they get bumped from one organisation to another," she said.

"But he thought my advice was fantastic. Noone else had ever given him this information."

Some callers are not this easy to deal with. One man rang recently "to talk to someone about magnets," Jenny said.

This is where the gentle interrogation techniques come in handy.

"We really need to understand what they want so we can put them through to the right person in just one phone call," Jenny said.

"You have to interrogate them to get these stories out of them.

"That's the hardest part and the most rewarding."

The man interested in magnets, it turned out, was inventing a shark-proof diving suit that would emit an electrical field.

Some enquiries are heart-breaking, like the frequent ones from farmers appealing for help and one unusual one that Jenny took in her first week on the job.

"A lady rang me up about cryogenics," she said.

"It turned out her three-year-old child had just drowned in the bath and she wanted to preserve her.

"That just about broke me up."

Though trained to deal with these difficult requests their biggest support is each other.

"You can feel the tension when someone else is dealing with a difficult call," Jenny said.

"You learn how to close calls courteously, and we support each other."

In more than five years on the job Jenny has never hung up on a caller.

"But I sometimes have to go for a walk to cool off," she said.

Commercial calls are particularly noted. Names and contact numbers are logged and distributed regularly to CSIRO business and industry managers.

Another large group of callers are students, some of whom show their appreciation by sending in drawings to Enquiries staff.

Enquiries manager Sian Manley has been in the job for just six months.

"I have been in call-centre management for 16 years," she said.

"And this contact centre is the most fascinating and rewarding environment I have worked in in a long time."

Jenny also enjoys her work.

"Everyone's different and rather wonderful," she said.

"And our people are incredible. They really help people in so many areas."

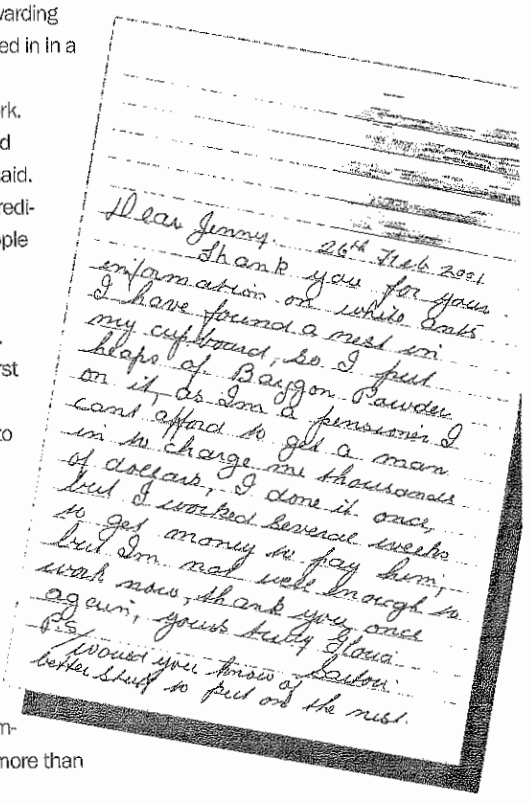
The success rate at Enquiries is remarkable. Resolution during the first call is between 75 and 80 per cent, according to Sian. This is more impressive given that 20 per cent of calls are not related to CSIRO.

"People believe CSIRO know everything," Sian said.

Enquiries staff rely heavily on divisional communicators and make more than 20 divisional-liaison visits a year to update their databanks of information and skills listings for each division. Each Enquiries staff member looks after three or four divisions.

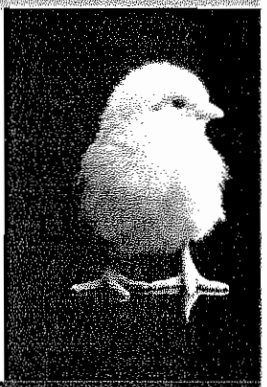
Enquiries has recently extended its service hours from 8.30am to 5.30pm. Phone 1300 363 400. A new CSIRO emergency after-hours number, 1300 363 400, has recently been set up.

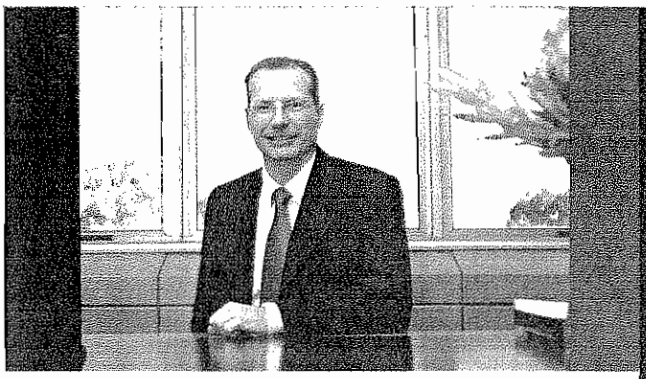
All CSIRO business cards are getting the international Enquiries number printed on them, and it has been posted on CSIRO's website.

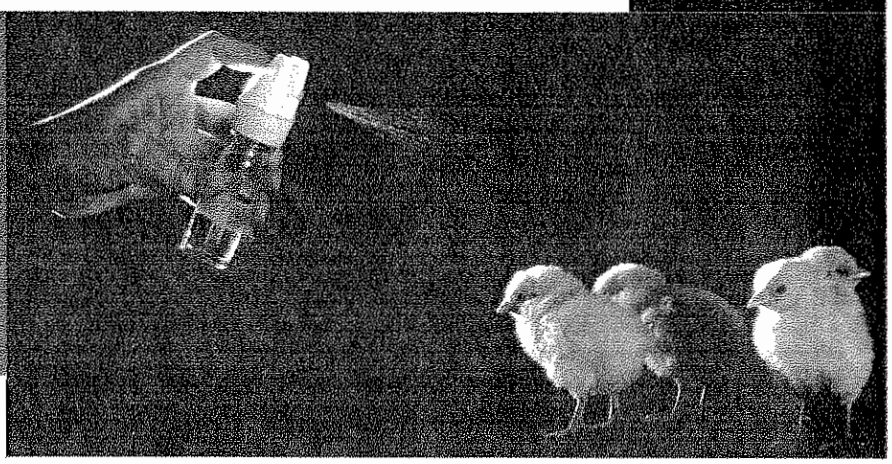

Dear Jenny... 26th Feb 2002
Thank you for your information on white Ants
I have found a nest in my cupboard, so I put
heaps of Baygon Powder on it as I'm a pensioner I
can't afford to get a man in to charge me thousands
of dollars, I done it once,
but I worked several weeks
to get money to pay him,
but I'm not well enough to
work now, thank you once
again, yours truly Gloria
P.S. Would you please Spell Baygon
better Spell so I put on the next.

Billion-dollar company is developing antibiotic alternatives

A company established to license new animal vaccine and biotherapeutic technologies from CSIRO is positioned to capture worldwide markets worth more than $1 billion.







In charge: *Dr Adrian Hodgson left CSIRO to head up VectoGen Limited.*

VectoGen Limited recently acquired the exclusive world-wide licences from CSIRO to four platform technologies for the pig and poultry industries.

Three US patents for these technologies have recently been granted and European patents are pending.

CSIRO Livestock Industries (LI) scientists began work on the technology about 12 years ago.

The group's principal research scientist, Dr Adrian Hodgson, resigned from CSIRO two years ago to become VectoGen's Chief Executive Officer.

LI scientists have been contracted to continue the research, and CSIRO will receive royalties from VectoGen's income and sales of products that use the licensed technology.

LI's Dr Jack Malecki said: "Income generated for CSIRO under the agreement will be reinvested in further research to benefit Australia's livestock industries."

The technologies are capable of replacing in-feed antibiotics.

Dr Hodgson said: "There has been increased pressure to withdraw antibiotics in the use of production animals.

"There is a concern it will contribute to the emergence of superbugs in humans."

One reason antibiotics are still used in the production of animals is that they improve productivity.

The VectoGen technologies have been demonstrated to outperform antibiotics in obtaining productivity increases. Birds treated with chicken gamma interferon delivered using the fowl adenovirus (FAVg) are up to 10 per cent heavier than chickens that have remained untreated over the same period.

"The $3.5 billion poultry industry needs to remain competitive through efficient production practices," Dr Hodgson said.

The other reason antibiotics are used as food additives in animals is to protect them against infectious agents.

FAVg enhances a chicken's immune system and its ability to respond to a variety of diseases.

The vaccines have other market advantages.

It is impossible to tell if an animal has been vaccinated or infected by a disease agent after some common vaccines have been used. The animal will always test positive for the disease agent. This is not so when the VectoGen vaccines have been administered.

VectoGen vaccines can be delivered by spray, injection or orally in water. Many vaccines can only be injected, which is particularly labour intensive when it comes to poultry.

The vaccines can also be grown and produced economically.

About 10 VectoGen products are under research, development and commercialisation.

Dr Hodgson said: "It has been a long haul.

"There's an enormous investment that goes into these technologies before commercialisation."

VectoGen is a subsidiary of the Australian publicly listed animal-health company, Imugene Limited.