CoResearch
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CSIRO AUSTRALIA

CSIRO and science placed under the microscope

Two reports dealing with issues of science and technology policy were released in December last year.

The Senate Economics Reference Committee Report focused on one aspect of CSIRO's research — research in support of the rural sector.

The other report, from the Industry Commission, was an in-depth analysis of Australian science and technology. It covered not only CSIRO but also the important science and technology efforts in the higher education and business sectors.

In a statement issued when the reports were released, CSIRO welcomed the current attention being given to science and technology in Australia as appropriate recognition of their importance to Australia's economic and other interests.

The statement noted that countries all over the world are grappling with science and technology issues. These issues deserve the highest attention in Australia as well.

The Industry Commission Review

The proposals in the draft report aim to enhance the contribution of R&D to national welfare by more clearly defining government's roles, improving funding processes, and making research more responsive to users and community needs.

The key proposals include:

CSIRO: The Commission calls for wider ownership of CSIRO's research agenda and for the Government to articulate clearly its own R&D requirements. The Commission said CSIRO's principal role is to undertake research that has direct value to industry and the community but lacks sufficient private returns to be performed or sponsored by firms ("public good" research). The results of its research should be widely disseminated.

This does not preclude CSIRO continuing to do some contract research for private firms, provided that it is priced

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As part of its centenary celebrations this year, BankWest in Perth is sponsoring a CSIRO research project aimed at minimising algal blooms on the Swan River. The $100,000 "Save our Swan" project will investigate the nutrients driven from the river's sediments, explain how nitrogren and phosphorus influence algal blooms, identify the trigger mechanisms for algal blooms, and model nutrient fluxes and cycling. A research laboratory barge emblazoned with the "Save our Swan" slogan, pictured at right, will be in Perth waters in February, and later at Freshwater Bay, Belmont and Heirisson Island.

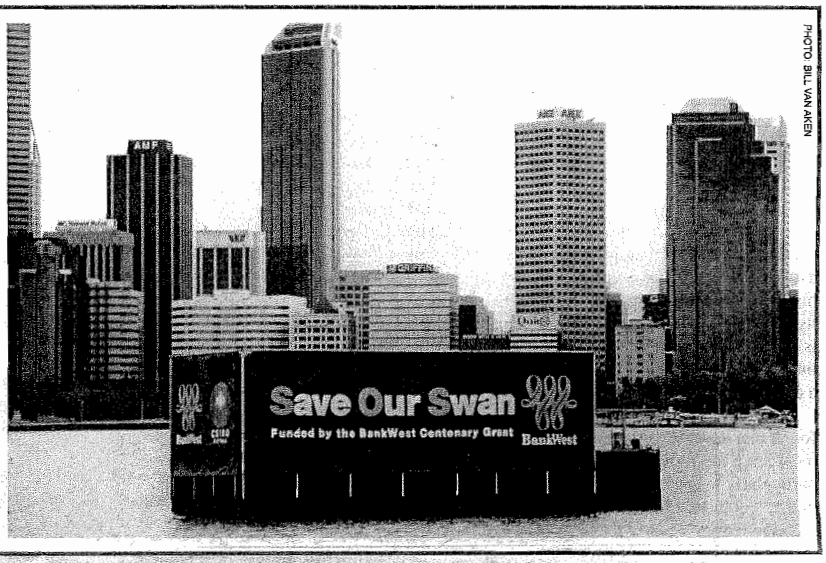


PHOTO: BILL VAN AKEN

Board evaluation continuing

The Board Evaluation Committee that is looking at our management structure and the way we do business has been continuing its work over the summer holiday period.

Its terms of reference were spelt out in the November *CoResearch* and on CSIRO's World Wide Web Server — in short, they are to establish what the Federal Government and customers want from CSIRO and how we can best supply what is needed.

The Committee has met twice, on November 9 and December 12, and has meetings scheduled for January 31 and February 20.

Four Chiefs were invited to make presentations to the December meeting — Ron Sandlands of Mathematics and Statistics (then Chair of the College of Chiefs), Phil Jennings of Tropical Animal Production, Chris Mallett of Food Science and Technology, and Graeme Pearman of Atmospheric Research.

The records of the November and December meetings were distributed to staff through Directors and Chiefs, and a Green Paper presenting the results of the Committee's work will be completed by the end of February and will be the basis for broad consultation with staff.

The Committee has operated through four taskforces:

1. Government interaction

Sandy Hollway, the Convenor, has been seeking input from departmental secretaries on how CSIRO's activities relate to Government requirements, in particular looking at CSIRO's accountability and its effectiveness in serving Government policy objectives and national priorities. The federal bureaucrats have been very cooperative and interested in assisting CSIRO in this task.

2. CSIRO's service/delivery to customers

Institutes have gathered information from existing documents to assess customers' views of our service and delivery. In some cases, further work has been done (or is planned) to get more information.

The assessments show several common features across the organisation. Two are that CSIRO's technical excellence is very highly regarded, but that our ability to listen to the customer is well below customer expectations. The taskforce has met the Australian Industrial Research Group and the Business Council of Australia, and individual companies are providing their own assessments.

3. International and national arrangements

Much material has been gathered from CSIRO visit reports and from publications to demonstrate the variety of arrangements used by R&D agencies. The focus of this activity is to identify any arrangements or best practices that might be considered appropriate for CSIRO.

4. Relationship between structural and behavioural changes

Dr Bob Frater, the Convenor, has worked with a group of participants in the Leadership Development Program to develop methodologies to address this issue. He has prepared a discussion paper on which he has been seeking comment from all staff through Chiefs and by electronic means on the discussion board "csiro-listen". The latter is a new venture in internal communication for CSIRO, and is provoking some lively discussions among staff.

The next issue of *CoResearch* will summarise the Committee's Green Paper and early reactions to it.

Comments invited

All CSIRO Divisions have been invited to comment on a set of draft working documents by Dr Bob Frater, Director of the Institute of Information Science and Engineering, who leads one of the Task Forces for the Board's evaluation.

Bob has also invited comments via an electronic bulletin board called csiro-listen, which, together with another similar one covering a wider range of issues, has produced some hot debate among the 250 or so registered users.

So far, the main participants seem to be from the animal and plant institutes, with several locked in battle (not to the death) with a few corporate managers.

The normal process of 'scrunity'

> **"CSIRO is subject to the normal process of scrunity by Senate Committee"**
> *— Draft Working Paper for the Committee of Evaluation of CSIRO's Management and Structure, "Existing Arrangements for CSIRO's Interaction with Government", CSIRO Office of Government Business, December 12, 1994*

From time to time the language is enriched by the entry of a new word that sums up perfectly a situation that would otherwise demand pages of text. Dr Heyde's word processor has defined our present position with elegant precision: CSIRO is being scruned!

The Industry Commission has just produced its draft report on R&D, and it's a report that seems to me to offer a good starting point for the development of a national science policy.

I am very pleased that the Industry Commission has recognised in the earlier chapters of its report that economic growth is linked to innovation, and that innovation itself is embedded in a culture of R&D.

The Commissioners also found that the national government has a funding obligation, particularly to provide research in the "public good".

In the case of CSIRO itself, the Industry Commission found the organisation to have "an important role in the Australian national innovation system, providing research services to the community and to industry".

It also found, however, that our organisation has been placed in the difficult position of being "all things to all people". This, the Commissioners recognised, makes it extraordinarily difficult to report successes against a set of objectives.

It has been my experience over the past five years that this lack of definition of the purpose for which resources are provided to the organisation makes life very difficult when defending and justifying our appropriation budget.

This has been recognised by the Board's recently established Evaluation Committee, and supplies one of its key tasks, namely to devise a process whereby the objectives of the organisation can be clearly aligned with those of government.

The Industry Commission went on to recommend that CSIRO's funding be moved over time from appropriation to contracted research.

This recalls the developments in British science policy during the late 70s, at which time a strong belief in the application of so-called free-market mechanisms to all areas of government endeavour was extended to publicly funded science.

However, these policy changes, which followed a report by Lord Rothschild, led to instability and uncertainty, and to widespread criticism that the narrow vision of government departments made it difficult for them to appreciate "truly pioneering original ventures... those for which the customers all lie in the future, not the present" (Sir Alan Cottrell).

In the months ahead, CSIRO will have ample opportunity to discuss and debate funding models in the context of the Industry Commission hearings. I welcome this debate. Its major positive outcome is likely to be a much clearer statement of the expectations the Australian Government has of CSIRO.

This will have to include a clear recognition of the importance of our organisation in opening international doors to Australian companies, and of our access to a crucial network of sources of knowledge on developments in science and technology around the world.

* * *

There was another rather odd process under way at the same time as the Industry Commission was gathering its information. This took the form of a Senate Inquiry into rural research.

The final report lacked any structure, was a collection of anecdotes with no judgment passed on conflicting evidence, and made a set of recommendations, some of which were even in conflict with each other.

In the words of the Minister for Industry, Science and Technology, Senator Peter Cook: "The review has taken six months, travelled all over Australia at great expense, and in the end produced a list of issues that are well-known and already under consideration by appropriate bodies." The Board Evaluation Committee will consider this report, together with all the other inputs we have received.

John Stocker, Chief Executive

Open for business

Vaughan Roberts (left) and Sam Tartaglia of the business unit of the Division of Manufacturing Technology are pictured soon after receiving their degrees of Master of Business Administration and Master of Management in Technology from the Melbourne Business School. Vaughn and Sam believe that with these degrees, in addition to their engineering qualifications, they are better equipped to take on the challenge of combining technology and business.

Letters to the Editor

This is a small footnote to the *CoResearch* November 1994 report concerning the Sir Ian McLennan Award to Dr John Possingham.

When Dr Possingham arranged to obtain a mechanical grape-harvester from Cornell University, the only transport to Australia was as deck cargo. As this would have exposed the harvester to the possibility of damage, the Scientific Office in the Australian Embassy in Washington, DC, was contacted. An approach was made to the Office of the Air Attaché, in particular to Fl. Lt. Rollo Teape-Davis RAAF, who was in charge of air transport from the US to Australia. Rollo agreed to the loading of the harvester on a cargo-carrying aircraft in view of the national importance of research into mechanical grape-harvesting! The machine arrived in Australia in good condition and in record time!

Clyde Garrow
Former Scientific Attache
Australian Embassy
Washington, DC

Is it right for CSIRO to spend multicultural Australian taxpayers' dollars on Christian cards when we recognise separation between church and state and we do not send equivalent greetings on the key anniversaries of other religions?

Peter Room
Division of Entomology
Long Pocket, Brisbane

Documents related to the Senate Economics Reference Committee Inquiry have been widely circulated within CSIRO. I have been specifically mentioned in some of these documents, in particular in a statement attributed to me by Senator Chapman and in a submission by Graeme Campbell, Member for Kalgoorlie. I have never met or been in contact in any way with either party; therefore I must conclude that their evidence is based upon hearsay. The basis for these allegations is not indicated.

As the Inquiry process did not offer me right of reply to these allegations, I have written both parties in an unofficial capacity regarding these matters, disputing their comments and offering to provide evidence in support of my position. I have also written Senator Ferguson, Chairman of the Senate Economics References Committee, suggesting that in future, people disparaged in testimony or in submissions which are publicly quoted and distributed be given the opportunity to respond.

I would like to assure colleagues in CSIRO that I never made the statement attributed to me by Senator Chapman. Further,the position represented by Mr Campbell regarding my assessment of the relative value of IAPP stakeholders and his contention that communication activities related to those proposals were directed to academic funding bodies are incorrect.

I take issue with a process which permits these parties to question my professional capabilities and actions and to vilify my character without giving me equal opportunity to contest their allegations. I further take issue with a process which extends rights such as withholding attribution of criticisms with no commensurate rights to the parties attacked.

Judy Marcure
Manager, Public Affairs & Communication
Institute of Animal Production & Processing

... and from the Editor

Dear Readers,

Coresearch has moved to Melbourne, and I haven't. I've been Editor for five years now, and they have been memorably interesting years. I've tried to inform and amuse — with varying success. On the score of amusing, particularly, I've spent a lot of time in water hot enough to hurt, but I feel very sad at leaving.

I thank you all for reading what I've put out over the years, whether for pleasure or duty, whether with irritation, interest or delight. I have certainly had much delight in the making of it. I've loved taking bad pictures for it, drawing rather strained cartoons for it and torturing my brain for misleadingly interesting headings.

And I do heartily wish the new Editor the best of multicultural luck with a difficult, exciting and very important job.

Liz MacKay

Enterprise deal includes trial of new travel expenses system

CSIRO will introduce a new system of travel booking and trial a new system of reimbursing travel expenses as part of an enterprise bargaining agreement reached in December.

The agreement provides a 2% pay rise for all staff plus a one-off payment of 1% of salary. A further 1% rise will follow in December this year if the trial leads to the implementation of the new travel reimbursement system.

The final form of the enterprise agreement between CSIRO and the union was settled late in January and submitted to the Industrial Relations Commission for certification.

Gary Knobel, CSIRO's Deputy General Manager of Human Resources, says staff can expect the pay rises — backdated to December 15 last year — to be paid in the second pay in February.

The new travel policy has two key elements: centralised booking arrangements, and a new system of reimbursing expenses that involves replacing fixed advances with travel charge cards. CSIRO will pay all reasonable travel costs charged on the cards, plus incidentals and other related travel costs.

Bookings

Gary Knobel says centralised booking will apply immediately across the whole of CSIRO. A travel contractor, to be appointed soon, will operate shopfront offices at major CSIRO sites — Clayton, North Ryde and possibly Black Mountain. Staff at other sites will make bookings by e-mail and fax.

He says this system will be more cost-effective than the present arrangements, which involve administrative staff at many sites acting as travel clerks to handle bookings.

The expense reimbursement proposal has been more contentious, prompting a stream of fiery e-mail correspondence.

With receipts required for all items of expenditure above $20, some doubted that there would be cost savings because of the time required for staff to document travel claims and for administrative staff to check receipts.

Gary Knobel says: "The important thing that a lot of staff haven't recognised is that the statement that comes monthly with the charge cards will be a simple form of reconciling and getting agreement on legitimate charges.

"They will still have to provide their receipts for items over $20 — that is normal accounting that you have to do if you purchase anything. But those receipts will not be gone through with a fine-tooth comb by a whole lot of admin people."

The previous system required a lot of checking to see that charged items were not already covered by an advance, he says. "This will be a much simplified arrangement, and basically it mirrors what every private-sector organisation is Australia does. Increasingly, the public sector is moving to exactly the same arrangements."

Gary Knobel says the new system will allow staff to claim any reasonable costs associated with travel. "Under the previous system, for instance, you couldn't get reimbursement of phone calls to home; you couldn't get your laundry paid for if you were away from home for a week. All those sorts of things will be legitimate charges now."

He points out that the new system will also open up the whole area of peripheral expenses related to travel, such as emergency care arrangements for dependents at home. "These family-related costs will be looked at favourably as well. It's not just about the cost of meals and accommodation."

Some staff saw an offensive implication that people were taking advantage of the present system, or that travel was a privilege, rather than an essential part of modern work requirements.

Reward

One said: "Many staff work long hours per day when on field activities for which the only tangible reward is what they can make as a saving (tax-free) from fixed-rate travel allowances by selecting acceptable but low-cost accommodation and meals."

Gary Knobel says that the new system will reimburse what people legitimately need to spend. "Unfortunately, some staff see the travel allowance they receive at the moment as partial reimbursement for having to be away from home for long periods and working extra hours in the field," he says. "This really is trying to separate the travel costs from things that need to be dealt with in other ways."

The trial of the new travel policy will be conducted at 11 CSIRO sites over the next year, and will be monitored by a joint union-management committee. "They will prepare a report comparing the costs and staff reactions, and suggesting changes if they are necessary," Gary Knobel says.

At the end of the trial period that report will go to both the Executive Committee and the Union Council and it will be negotiated to determine the form of the system to be ultimately adopted.

Remote localities allowance

The enterprise agreement has made no change to the policy on the remote localities allowance, other than removing from the list several locations where CSIRO no longer has staff and is unlikely to have staff in future.

The next round of enterprise bargaining will include discussions on removing the allowance if a staff member at a remote site has been recruited from the surrounding area.

Productivity issues

The new enterprise agreement has several productivity components, including provision for home-based work and for staff to work as little as 40 weeks on a pro-rata salary, with holidays during all school holidays.

"They are important in terms of increasing the flexibility of the way in which we work," says Gary Knobel. "But the areas where the most money is likely to be realised are improvements to health and safety performance and, potentially, travel."

Air contract takes off

After a review of its travel contract, CSIRO is switching from Qantas Airways to Ansett.

Gary Knobel, CSIRO's Deputy General Manager of Human Resources, says the move will bring substantial cost savings.

The change comes into effect on 3 April and Divisions will be given details over the next couple of weeks.

Standards champion retires

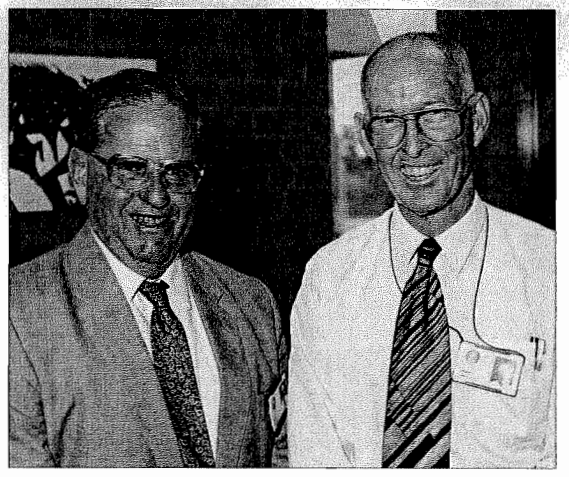
Dr Bill Blevin, Chief of the Division of Applied Physics, retired on October 28 last year after 42 years with CSIRO.

Dr Blevin was farewelled at a formal dinner at Sydney University, and later at a staff gathering where he was praised by Dr Colin Adam, Director of the Institute of Industrial Technologies.

Dr Adam told the gathering that Dr Blevin led his team through "a particularly difficult period of Australia's industrial history" that resulted from the reduction in tariffs.

Dr Blevin was known particularly as the champion of the Division's standards function. "We will certainly be influential in the Pacific region, and we have already had visitors from research and standards laboratories around the region for training here," Dr Adam said. "We see that role of the Division as being vital."

One of Dr Blevin's last acts internationally as chief of the Division was his involvement from July last year until his retirement in establishing and leading a multinational Task Force for the APEC (Asia-Pacific Economic Cooperation) Forum.



Bill Blevin (left) with his deputy, John Collins: A staunch defender of the Division's standards role

Dr Blevin's role reflects the National Measurement Laboratory's growing importance in regional affairs. A crucial role is also being taken by the Division of Applied Physics' chief standards scientist, Dr Barry Inglis, who on October 28 became coordinator of the Asia Pacific Metrology Program for the next four years.

Dr John Collins, Dr Blevin's deputy throughout his term, said Dr Blevin had represented certainty in uncertain times during his six years as Division Chief, when a great deal of change was occurring. When the Division was under attack, Dr Blevin had "set his jaw" and defended it, particularly when the Division's standards role was under threat.

Dr Blevin said he believed he was leaving the Division in pretty good shape. "I think we have worked harder in recent years. It's been a challenge, but we have got great pride from it."

Dr Blevin was appointed Chief of the Division in 1988 as the culmination of a distinguished research career in scientific metrology and applied physics.

He has served terms as Member of Council and as Vice-President of the Australian Academy of Science.

In the 1989 Queen's Birthday Honours he was made a Member of the Order of Australia.

He is a Commissioner and Past Chairman of the National Standards Commission, a member of the Council Executive of the National Association of Testing Authorities, and a member of the Council of Standards Australia.

Internationally, he is a Vice-President of the International Committee of Weights and Measures at Sevres, France, and President of its consultative committee on photometry and radiometry.

Short shots

Chief executive transition

DR ROY GREEN, Director of the Institute of Natural Resources and Environment, will be located at CSIRO Head Office in Melbourne from February 1, to assist with the transitional arrangements for the Chief Executive as Dr Stocker prepares to depart on March 3. It is proposed that Roy will continue working at the Head Office until a new Chief Executive is appointed and takes up the position.

Antidote to ryegrass poisoning

CSIRO has developed a new antidote for sheep poisoned by annual ryegrass toxicity (ARGT). ARGT is a disease of grazing livestock in the 350–550mm rainfall areas of Western Australia, South Australia and, recently, New South Wales. The number of farms affected by ARGT doubles every three years.

The antidote was tested in October, with the assistance of four WA farmers, during the first outbreak of ARGT for 1994. It is the first treatment to be developed against the disease and has taken many years to develop. The work has been supported by sheep producers through the International Wool Secretariat.

CSIRO is also researching other approaches to the ARGT problem, such as a vaccine and ways to prevent ryegrass becoming infected in the first place.

Lead contamination shown to travel

RECENT research by CSIRO's Dr Brian Gulson has highlighted the need for special care in carrying out renovations involving the removal of lead paint. Houses previously "de-leaded" by their owners were found to have been contaminated by lead paint from other renovations or from deteriorating surfaces in the neighbourhood. These results confirm for the first time that paint particles containing lead can be transported some distance and may ultimately contaminate the wider neighbourhood.

Unfortunately, these particles may be invisible to the naked eye, and lead-contaminated dust can be picked up on the hands and swallowed or even inhaled. The groups most at risk from the adverse effects of lead from lead paint are pregnant women and young children.

The Commonwealth Environmental Protection Agency, in association with the Australian Paint Manufacturers' Association, has produced information sheets covering safe removal of lead paint, and these are available from hardware stores. The best way to avoid the problem of lead contamination is to use paint removal methods that do not create dust.

Cutting greenhouse gases at the outlet

CSIRO is testing a new compound for livestock that may take the wind out of any proposed greenhouse gas emission tax, while boosting production and saving farmers money. The non-toxic compound is an antimethanogen, meaning it reduces the amount of methane gas animals release to the atmosphere.

The Federal Government has agreed to stabilise greenhouse gas emissions at 1988 levels by 2000 and to reduce emissions by a further 20 per cent by 2005. One proposal to achieve these reductions is an emissions tax aimed at methane-producing ruminant livestock, such as cattle and sheep. (Australia's cattle and sheep produce 2.2 million tonnes of methane each year.) Such a tax could slash Australian farmers' incomes by a third, or more than $650 million a year.

Reducing greenhouse gas emissions is not the only benefit of the new antimethanogen, which also causes metabolic changes that lead to a more efficient use of feed. Trials with CSIRO's antimethanogen in cattle have shown increased live-weight gains and feed-conversion rates, with the weight of cattle on high-roughage diets increasing by up to 20 per cent.

CSIRO is now trialing the compound on cattle in Queensland and sheep in Western Australia. The work is backed by farmers through the International Wool Secretariat and the Meat Research Corporation.

New study of Boran and Tuli cattle

IN THE largest comparative evaluation of cattle breeds ever undertaken in the tropics, CSIRO is demonstrating the role of the new African breeds in improving productivity. There was widespread interest in the evaluation results in the lead-up to the first sale of Boran and Tuli bulls on December 1 in Rockhampton (and on the computer selling network CALM). More than 1,300 animals are involved in evaluations of weight gain, carcase quality, meat quality, fertility, ease of calving, early calf mortality and resistance to the stresses of the tropics such as ticks and drought.

Results collected over three years show that crossbreds always outperform their straightbred counterparts, whether or not they have been treated to control ticks and worms. British breeds of cows mated to Tuli bulls have a low incidence of calving problems. Their crossbred calves have higher survival and growth rates than the straightbred British calves, with no loss of reproductive potential or meat quality.

Members of the 1994 Division of Fisheries triathlon teams: (from left) Peter Jolly, Hugh Kirkman, Sjaak Lemmens, Rick Horbury, John Nielsen, Mat Vanderklift, Scott Langtry, Gary Carroll, Dennis Heinemann, Ben Sutherland; (front row) Denise Kirkpatrick, Liza Mathews and Lisa Scott.

Fisheries regains trophy

A series of competitive sporting events in Western Australia has proved that staff at the Division of Fisheries Marmion Marine Laboratories are as proficient on land as they are underwater.

Five teams from the Division entered this year's Mike Rayner Triathlon in a bid to wrest back the trophy lost last year to the Laboratory of Rural Research.

The annual triathlon, held in April, is named after former CSIRO scientist Mike Rayner, who died in 1988. Fisheries lost the inaugural contest six years ago but since then have been hard to beat. The exception was last year, when the Division was pushed back into third place. The loss added extra drive to the staff's desire to prove their abilities in this year's event.

After months of disciplined training, the Fisheries teams — which included nearly half of the Division's WA staff — were honed for the big event.

First out of the water on the big day was the Division's Flying Fins member, Rick Horbury, with a commanding lead. John Nielsen took over from him on the bike, sustaining the lead, and Hugh Kirkman, the third member of the team, ran across the finishing line to claim victory for the Fins and the Division.

In the aftermath of the victory, the Division took on a composite team of CSIRO staff from all other West Australian divisions in a nail-biting round of softball. Fisheries lost 7 to 8 but, undeterred, are already planning a comeback.

The staff are now involved in a rigorous training program aimed at issuing a challenge to all CSIRO divisions to contest the sport of champions — frisbee throwing.

Indian honour for Holliday

Dr Robin Holliday, Chief Research Scientist at the Division of Biomolecular Engineering's Sydney laboratory, has been elected a Foreign Fellow of the Indian National Science Academy in New Delhi.

Dr Robin Holliday

Dr Holliday's professional association with India began 20 years ago. "I was brought up in Ceylon (Sri Lanka), and my interest in this area resulted in the exploration of India as well," he says. The initial scientific contact was with Professor Kanungo at the University of Varanasi (Benares) who, like Dr Holliday, researches biological ageing.

Since then, Dr Holliday has visited laboratories as far afield as Bombay, Calcutta, Bangalore and Delhi. His extensive contact with Indian scientists springs from his own wide-ranging interests, which include genetic recombination and repair, ageing, especially cellular ageing, and DNA methylation and gene expression.

Dr Holliday completed his PhD at the University of Cambridge in 1959 and joined the staff of the John Innes Institute in Hertford, England, where he developed a theory of genetic recombination now known as the Holliday model. By 1970 he was head of the new genetics division at the National Institute for Medical Research in London.

Dr Holliday has been with CSIRO since 1988.

Dr Holliday's new book, *Understanding Ageing*, was published by Cambridge University Press in January. The book explains why ageing exists in animals and reviews our understanding of it at a biological level. It draws on material from a wide range of disciplines, including extensive biomedical information about age-related diseases in humans.

The book argues that much research needs to be done on cellular and molecular aspects of ageing if the origin of these diseases is to be understood, and that this understanding could lead to their prevention.

Science confronts the New Uncertainty Principle

Sixty-seven years ago, German physicist Werner Heisenberg informed us that we cannot determine with any degree of accuracy both the position and the momentum of a subatomic particle. This is the famous Heisenberg Uncertainty Principle of quantum mechanics.

This principle revolutionised high-energy physics, taught us to think in relativistic rather than absolute terms, and has guided subsequent generations of research scientists.

Heisenberg, of course, received the 1932 Nobel Prize for his trouble.

Today, science in the United States faces a new uncertainty principle. This principle says that we cannot forecast with much accuracy the position, the momentum, or the probable intersection of society's goals, the nation's political agenda, and the scientific merits of our national research enterprise.

Like Heisenberg's postulation, this new uncertainty principle is revolutionising the management and direction of America's labs, is teaching us to think in relativistic rather than absolute terms, and is guiding — and sometimes vexing — modern generations of research laboratory directors, including this one.

There is an important difference, however. Our reward for planning the labs' future in accord with this new uncertainty principle will not be a Nobel Prize.

Instead, our reward will be our survival in the 21st Century as vital and essential American institutions.

This article is adapted from a speech delivered by Alan Schrieshem, director and CEO of Argonne National Laboratory in Illinois, at the General Motors R&D Centre in Detroit on November 9 last year

Conflicting agendas

Once, the vagaries of scientific research were acceptable in America because political, scientific and social agendas largely coincided. We wanted national security in the face of threats from a large and well-defined enemy, we were destined to grow, and we needed energy to do it. These agendas no longer coincide.

Interplay and occasional conflict among the objectives of science, government and society are relatively new additions to the environment within which the nation's research labs function.

The divergence of political, social and scientific agendas happened slowly. It was, perhaps, the chemists who came up against it first — in the environmental firestorm erupting from the pages of Rachel Carson's *Silent Spring* (Boston, Houghton Mifflin, 1962) and the anger of Love Canal. The energy labs got a wake-up call from the OPEC oil embargo, smog warnings, Three Mile Island, Chernobyl, oil-soaked shore birds and the so-called ozone hole. Our colleagues in high-energy physics encountered it somewhat more recently, in the scuttling of the superconducting supercollider.

But the biggest single impetus to change in American research came when the Cold War collapsed in the rubble of the Berlin Wall. Suddenly, America no longer faced a well-armed, technologically sophisticated enemy capable of destroying us with just 30 minutes' warning. Defence research needs, projections and budgets dropped precipitously, and are still falling.

Major new challenges moved to the forefront in post–Cold War America, and the national scientific and technological establishment began to feel the pain and promise of a fundamental transformation. Nowadays, industry is increasingly seeking out opportunities to team with other R&D performers — including former competitors — in the development of new technologies.

Progress at any cost is out. Fiscal accountability, environmental responsibility and cost efficiency are in

There is growing political pressure for all public investments to be tied more closely to national needs — as those needs are perceived by the Washington political establishment.

Scientific latitude was greater in the past because we could presume continued national consensus on exactly what the needs were. That's no longer so. The startling results of the November elections in the US are the latest in a series of reminders that the definition of "national needs" today is a moving target. Here's the core of the whole "New Uncertainty Principle": Science must not only determine what today's definition is, but also project — some might say divine — what the definition will be tomorrow and plan accordingly. Assuming we do that, and to further compound a complex situation, we must craft our course to recognise tomorrow's definition while not falling afoul of today's.

What is already apparent is that the principles of total quality management are increasingly being applied throughout industry and government, including at research institutions. And the traditional boundaries between federal R&D agencies are getting fuzzier, as the nation seeks to provide multi-agency, coordinated approaches to satisfying national needs. "Progress at any cost" is out. Fiscal accountability, environmental responsibility and cost efficiency are in. And, in a trend likely to continue, research under way or projected is far more likely than in the past to have a strong thrust toward marketplace applications.

Environmental protection, long a goal of some research, is rapidly becoming a precondition for all research. International competitiveness and job creation are only slightly below in the pecking order.

From push to pull

We now find corporations with global competitive interests deeply involved in cooperative R&D agreements with national laboratories. At Argonne, we already work with DuPont of Wilmington, Delaware; Midland, Michigan-based Dow Chemical; Amoco of Chicago; IBM in Armonk, New York; New York-based Exxon; and many others. We are collaborating on profit-oriented projects aimed at producing higher-quality fibre, stronger materials, more effective pharmaceuticals, faster computers, safer herbicides, and lower-cost gasoline. We are fully engaged in technology transfer and have even helped create spin-off companies.

Ten years ago, these activities would have been exceptional. Today, they represent a major research management trend at the national laboratories. We increasingly serve as a common ground to integrate skills, capabilities, technologies, facilities and research organisations — including partners from throughout the laboratory system, other federal agencies, industry, academia, and other nations. Clearly, we are moving from a technology-push philosophy to a market-pull philosophy.

New paradigms

Increasingly, we find that proposed research must be shown to benefit social goals and political objectives as well as to advance science and technology. Whether we call

continued next page

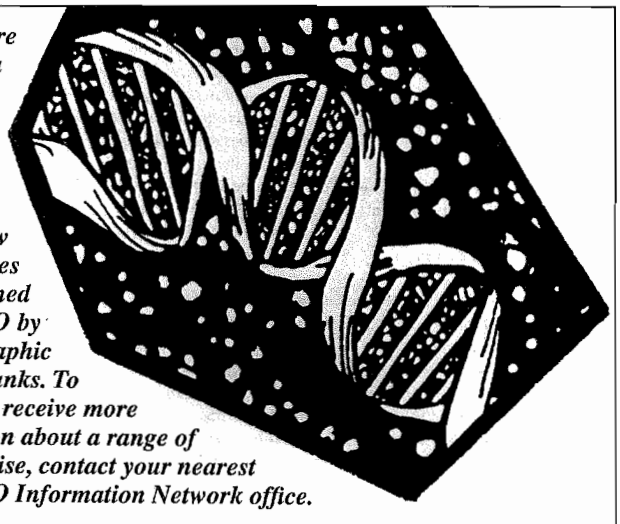
Calling all scientists

Are you interested in extending the results of your research through CSIRO's *Rural Research* magazine?

Rural Research is widely read by agricultural advisers, leading-edge primary producers and key decision-makers in agriculture. A recent survey of more than 200 agricultural advisers, carried out by the CRC for Soil and Land Management, found that it was the most widely read publication for obtaining information on soil and land management. More than half the respondents indicated they used it on a regular basis.

Rural Research is distributed to all branch offices of Departments of Agriculture in each state and staff from these departments often adapt items from the magazine to include in their regular columns in local papers — in this way, stories spread much more widely than the magazine's immediate readership.

Rural Research is published by CSIRO Information Services in Melbourne and written by a network of freelance writers. If you think your work may provide an interesting story for *Rural Research* readers, why not discuss it with the editor? Contact Robin Taylor, Managing Editor, *Rural Research*, phone (03) 418 7205; fax (03) 419 6574; email robin.taylor@cis.csiro.au.



This picture represents a DNA Double Helix Twisting Ribbon. It is just one of the images featured on the new corporate scarves and ties designed for CSIRO by Victorian graphic artist Susan Banks. To order or receive more information about a range of merchandise, contact your nearest CSIRO Information Network office.

Collaboration with industry

On November 10 last year the Division of Building, Construction & Engineering, through its Chief, Larry Little, hosted a dinner in Melbourne for about 30 Boral executives and a similar number of relevant researchers from nine divisions of CSIRO.

Speakers at the dinner included Dr John Stocker and Boral CEO Tony Berg. Alan Reid and Ian Ritchie from the Institute of Minerals, Energy and Construction were also present.

The dinner was the forerunner of a Boral/CSIRO Building and Construction Day the following day. It was attended by Chiefs of Coal & Energy Technology, Forest Products and Mathematics and Statistics, and the Deputy Chief of Manufacturing Technology, plus representatives from Applied Physics, Chemicals & Polymers, Mineral & Process Engineering, Mineral Products, and two other researchers from Coal & Energy Technology.

The aims were to forge links and raise awareness of the needs and capabilities of Boral and CSIRO, to search for mutually beneficial areas of collaboration, to send a strong signal about the critical role of research and development activities, and to enable both Boral and CSIRO to reach long-term goals. We hope these links will bear fruit in exploring business opportunities and projects with Boral.

Working together: At the dinner (from left), Boral CEO Tony Berg, Dr John Stocker, and Dr David Ho from the Division of Building, Construction and Engineering

New face on Board

Sandy Hollway, the Secretary of the Department of Industry, Science and Technology, has been appointed to the CSIRO Board for a three-year term from December 6 last year.

After joining the Department of Foreign Affairs in 1969, Mr Hollway held posts in Islamabad, Bonn, Ottawa and Washington.

Before joining the Department of Industry, Science and Technology in 1993, he spent eight years with the Department of Prime Minister and Cabinet, including three years as a principal adviser to Bob Hawke.

• Dr Tony Gregson has been reappointed to the CSIRO Board until March 31 this year. Sir Gustav Nossal, a member of the Board since its inauguration in 1986, completed his current term on December 6.

The New Uncertainty Principle

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some other term, it is the new reality. What also makes it the new uncertainty is the fluid nature of societal goals and the political agenda — not to mention the inherent uncertainties of venturing beyond the state of the art.

This new paradigm does hold promise for the nation, particularly in the short term. But it is not without its pitfalls, especially for those of us engaged in basic research, for which the industrial, economic and environmental pay-offs are unspecified and largely unpredictable, and for the average citizen can be so obscure as to be non-existent.

Eminent marine biologist Eugenie Clark wrote in 1969 (*The Lady and the Sharks*, New York, Harper and Row, Chapter 1): "Not many appreciate the ultimate power and potential usefulness of basic knowledge accumulated by obscure, unseen investigators who, in a lifetime of intensive study, may never see any practical use for their findings but who go on seeking answers to the unknown without thought of financial or practical gain." Her comment is even more apt today, as anyone involved in the ill-fated superconducting supercollider will no doubt agree.

Hers is a point we should remember as we strive to blend scientific potential with political reality, economics and environmentalism heading into the 21st century. We must continue to advance science in a society where researchers will increasingly be challenged to justify their work, especially on economic and environmental grounds. Such concerns, now largely confined to North America and Europe, will expand to Asia, Africa, and other areas where they have not traditionally been a major consideration.

Proposed products and processes will have to be proved environmentally benign before they receive approval to proceed. This prior-proof requirement could have one troublesome effect — shorter-term thinking in the research community. We may be tempted toward the safer course of evolving current products rather than the environmentally and economically riskier path of developing wholly new products.

Most of the research projects American science undertakes from now on will almost certainly include a strong energy context, flavoured with an environmental and job-creation agenda. In fact, the energy imperative will supplant defence as the main research driver in the 21st century. World population is expected to double by mid-century. Global energy demands are projected to at least quadruple (even with stringent conservation measures in place). Society's burgeoning need is apparent.

Walking through a bookstore one recent weekend, I noticed a copy of Thomas Wolfe's famous work *You Can't Go Home Again*. Wolfe wasn't writing about research laboratories, of course, but he might just as well have been. For we can't go home again, either. That is, if "home" means the past — a time when science was apart from, or "above", society and politics, somehow entitled to the public's support yet not really accountable except to future generations.

Management principles

To come to terms with the new uncertainty principle, we — like Heisenberg's contemporaries — must change our perspective and our methods. We must formulate and adopt new research-management paradigms. Here are four candidates:

1. The degree to which politics and society will support scientific research is directly proportional to perceived return on investment. We research directors must be able to articulate the return to be derived from public investments in our work. We must not only be able to, but also willing to.

2. Pre-challenge political involvement is always more effective than post-challenge involvement. The research community must become more engaged in the political world and with its denizens, preferably before projects are challenged. We must overcome our community's traditional disdain for the "soft sciences" such as politics and sociology, recognising that ultimately politics controls the money and support we need to do our work. The extent to which we avoid the political process is precisely the extent to which others will decide our fate.

3. The more the public knows about science and technology, the more likely it is to support science and technology. Here is an important issue for the 21st Century — scientific literacy. We scientists have a clear obligation to increase scientific literacy in American society. Doing so will help our fellow citizens cope with what we all know will be an increasingly technological world. Doing so will also foster greater understanding of what it is that we do.

In short, working to improve scientific literacy is not only the right thing to do, but also the smart thing.

4. Finally, it is wise to remember that, when you are speaking to an audience of Greeks, communications efficiency increases markedly if you speak Greek.

Scientists must do a better job of making our case in terms that politics and society understand. In hindsight, arguing for billions of dollars to build the superconducting supercollider because it might help us locate the Higgs boson may go down as a textbook example of speaking Russian to the Greeks, and then being surprised when the Greeks do not understand — or do not wish to contribute to the effort.

At the national laboratories, we see our role in the 21st Century as that of a neutral site and a robust bridge, connecting all the country's research communities, universities, industries, and federal, state and local government agencies in a common research enterprise geared to the needs of society, both today and tomorrow.

Precisely because the national labs deal daily with the New Uncertainty Principle, we may well become the catalyst that helps our colleagues in the American research community continue the advance of science and technology.

Reprinted from The Scientist, *Vol. 8, No. 24, page 12, December 12, 1994.*

Electronic newspaper

***The Scientist*, a biweekly newspaper for scientists and the research community, published in the United States, is now available electronically on the Internet — free of charge. The full text of issues since November 1992 is accessible.**

Founded in 1986, *The Scientist* covers current issues (recent ones have been laboratory design and combining motherhood with a scientific career) and events relevant to the professional research environment. It is somewhat similar to *Laboratory News* and although its focus is mainly the US, it contains some very useful articles and updates of interest to Australian science. The above article by Alan Schrieshem is an example.

You can get *The Scientist* via email, ftp, Gopher, WAIS and WWW. The instructions are simple but a bit long to print here, so if you would like them, email or fax Jenifer North — J.North@cbr.cpa.csiro.au; fax (06) 276 6641.

Achievement Medallions for 14 members of staff

Dr John Stocker awarded Australia Day Achievement Medallions to 14 CSIRO staff this year.

The medallions are provided by the National Australia Day Council for award by Commonwealth Government departments and major agencies, such as CSIRO. They are presented to officers who have made a noteworthy contribution in the past year or given outstanding service over several years.

This year's awards to CSIRO staff included a posthumous one, to **Janice Margules**, who died last September. She was a highly valued member of the administrative staff of the Division of Water Resources in Canberra, and in nearly 17 years with CSIRO she made a significant contribution to the development of the role of personnel manager in the organisation.

Janice established a wide reputation for her commitment to the maintenance of equality and fairness in staff matters and for the professional and personal counsel she provided to current and former staff. Her husband, Dr Chris Margules (Division of Wildlife and Ecology, ACT), accepted the honour on her behalf.

The other recipients were:

Nick Alexander (Communication Services, East Melbourne): for helping to make CSIRO's science accessible to Australians from all walks of life, as well as to international audiences, through various media from film to exhibitions.

T. Adrian Beech (Division of Soils, Glen Osmond, South Australia): for a varied contribution over 15 years of service, in recent years including skilful planning that enabled the Analytical Chemistry Unit of the Division of Soils to manage increased demand yet achieve a significantly reduced turnaround time for the diverse range of services it provides to CSIRO and external clients.

Dr Willem Bouma (Division of Atmospheric Research, Aspendale, Victoria): for major contributions to management, policy development and communication, and promoting community awareness of the scientific aspects of climate change.

Roger G. Digby (Division of Manufacturing Technology, Preston, Victoria): for services over 29 years, especially in developing a strategy for the management of CSIRO's apprentices that has helped to ensure an appropriate technical skill base for the future.

Aileen Donoghoe (Head Office, Parkville, Victoria): for services to the Chief Executive, giving invaluable assistance to the last three CEOs by combining broad knowledge and skill in communication.

Keith Gould (Division of Tropical Crops and Pastures, Mundabbera, Queensland): for work at the Narayen Research Station, as an enthusiastic participant in Project Ambassador (launched in 1990 to help promote CSIRO in the community), and for helping to win CSIRO great support from the beef cattle industry, its related government groups, training institutions and other research bodies.

Jim Gould (Division of Forestry, Yarralumla, NSW): for work on grass fire behaviour and prescribed burning, and for contributing to the eventual validation of CSIRO's National Bushfire Model, SIROFIRE, by working under great pressure during the 1994 NSW bushfires.

A. (Lex) Govaars (Division of Plant Industry, Black Mountain, NSW): for a 30-year contribution to CSIRO, currently as Manager of the Plant Introduction and Quarantine Unit, maintaining CSIRO's compliance with strict quarantine procedures and facilitating research in many Divisions.

Ian Kneebone (Division of Horticulture, Merbein, Victoria): for conscientious service over 43 years, with current responsibilities including propagation of seedlings and distribution of cuttings from the grape-breeding program, and sampling, harvesting and wine-making in the experimental winery at Merbein.

George Kerridge (Division of Horticulture, Merbein, Victoria): for contributions to CSIRO's grape-breeding program, to the planning and operation of the experimental winery at Merbein, and to the management of the wine grape quality laboratory, accepted as a model by State Departments of Agriculture, teaching institutions and the wine industry.

Bob Lewis (Division of Entomology, Black Mountain): for 40 years' service that has included work on managing field outbreaks of grasshoppers and, at present, as Manager of the high-security quarantine facility in the Division of Entomology.

Jenifer North (Public Affairs, Canberra): for loyal and dedicated service since 1970, particularly in the communication and information areas, currently as Manager of Corporate Communications. Jenifer is one of the few CSIRO staff to have served at Divisional, Institute and Corporate levels.

David Smith (Division of Forestry, Yarralumla, ACT): for technical work during the past year in research to identify regions of pine DNA that contain genetic markers named microsatellites, which has helped lay the basis for improving the economics of Australia's most important plantation species, and taking this work further to locate and characterise microsatellites in *Eucalyptus nitens*, one of the premier temperate eucalypt species.

PHOTO: LOUISE LOCKLEY

CSIRO Chief Executive Dr John Stocker and Chairman Professor Adrienne Clark with Chairman's Medal winners Dr Dharma Shukla and Dr Colin Ward

Medal for virus research

Dr Dharma Shukla and **Dr Colin Ward** of the Division of Biomolecular Engineering were awarded the 1994 CSIRO Chairman's Medal for contributions to the characterisation of the largest and most complex group of plant viruses.

Their classification scheme for potyviruses has changed the way scientists worldwide detect, identify and control them. The results will greatly reduce the $20 billion-a-year loss to the global economy caused by plant diseases.

The Chairman's Medal, which carries $25,000 in prize money, honours the very best in CSIRO research. Since 1991 the gold medal has been awarded annually to a scientist whose research is of national or international importance in advancing scientific knowledge, application of technology, or commercialisation.

The CSIRO Medals, established in 1985, honour excellence in Australian research to benefit the nation. In 1994, CSIRO Medals were awarded to:

Dr Wayne Meyer (Division of Water Resources), for research in irrigation water management.

The Australian Tree Seed Centre, represented by Stephen Midgley, Dr John Doran, Dr Chris Harwood, Brian Gunn, Beryl Thompson and Tim Verco (Division of Forestry), for the exploration of forest genetic resources.

Dr Ron Sharpe (Division of Building, Construction and Engineering) for development and commercialisation of BCAider, an expert system that helps ensure compliance with the Building Code of Australia.

Australia Day Honour

Dr Toby St George, a former CSIRO scientist, became a Member of the Order of Australia in this year's Australia Day Honours.

Dr St George's research on insect-borne viruses of animals placed him in the front rank of the world's animal virologists and gained him the degree of Doctor of Veterinary Science from the University of Queensland in 1985.

In 1968 he began research at CSIRO on virus infections of Australian livestock. His multi-disciplinary group of 16 scientists and technical staff operated through northern and eastern Australia.

The team's research has been of great importance to Australia's livestock industry. Three of its major findings related to bovine ephemeral fever, bluetongue virus and Akabane virus and its sero-relatives.

Dr St George also instituted and operated the Australian sentinel herd system, which indicated his capacity for organisational management and scientific group leadership.

Dr St George retired from the Division of Tropical Animal Production in 1992.

CSIRO and science under the microscope

from page 1
to fully recover costs and does not jeopardise its broader role. (Dr Stocker's column on page 2 comments on the IC Report.)

Universities: The Commission called for an enhanced role for the Australian Research Council, to give it more autonomy and responsibility for Research Quantum funding.

Business: The Commission found that the 150 per cent tax concession has yielded a net payoff to the Australian economy. It recommended more widespread R&D support through grants, or through tax credits for smaller companies unable to use the tax concession. The Commission believes this is a more effective approach than relying on selective assistance schemes.

Rural sector: The draft report recommends that levels of support for rural R&D funding through the rural research corporations be made consistent with incentives provided to other sectors — a contentious recommendation that could result in substantial reductions in government support for the rural research corporations.

Some corporations have industry levies matched on a dollar-for-dollar basis by the Government that exceed the effective benefit available to private corporations through the 150 per cent tax concession.

The Senate Committee Report

The Senate Report into the Administration and Funding of Rural Research made 19 recommendations on CSIRO's Structure and Administration, Funding, IAPP Restructuring Proposals, Commercialisation, Communications and the Scientist' s Perspective.

The key recommendation included that the CSIRO Board take a stronger role in the leadership of CSIRO, streamline management and administration, and improve the organisation's communications.

On rural matters, the Senate Committee recommended that CSIRO reinstate the high-priority ranking of rural research and funding appropriate to that ranking; and that the Government commission an independent study of the system of rural levies and how they are applied to research, and how the levy system could be expanded to include industries that are benefiting from, but not contributing to, that CSIRO research.

On the IAPP restructure, the Committee specifically recommended that the Division of Wool Technology should postpone any decision to amalgamate its two laboratories until the direction of wool industry funding becomes clearer.

The sites at Long Pocket and Yalanbee, Longford and Arding should also be retained by CSIRO for field research.

On funding, the Committee recommended that CSIRO, in collaboration with industry and government, find ways to buffer research programs against cyclical downturns in the rural sector; assess whether the 30 per cent target has altered the ratio of fundamental to applied research; and limit its legal liabilities when commercialising research.

CSIRO has noted the recommendations of the report and said that many of the recommendations have already been dealt with by the CSIRO Board or are being considered in the evaluation of CSIRO's management and structure now being undertaken by the Board.

This evaluation will draw on the Senate Report and Industry Commission Report. The Government is expected to discuss its response to the Senate Report in February. CSIRO's response to the Industry Commission Report is due at the end of February, with hearings in early March.

For more information contact Phillip Moore in the Government Business and Policy Section on (06) 276 6252.

Minister visits Division

Indonesia's Minister for Public Works, His Excellency Ir Radinal Moochtar, and six leading Indonesian businessmen visited the Division of Building, Construction and Engineering in Melbourne on November 22.

The businessmen accompanying the minister on the visit included the director of one of Indonesia's largest construction developer groups, the head of its largest water, irrigation and power generation scheme, and the leader of one of its largest housing contractor and urban development groups.

Most had an engineering background and were very interested to see relevant work of the Division — including work on concrete and on planning tools such as BCAider — and to learn about CSIRO during the three-hour visit.

Indonesian businessmen listen as Minister Moochtar talks to researcher Dr Kwesi Sagoe-Crentsil during his visit

Minister Moochtar's background as head of the Public Works Department gave him a particular interest in our work.

Brian Howe, the Deputy Prime Minister and Minister for Housing and Regional Development, had suggested the visit, which staff and the visitors found mutually beneficial.

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Fire dance: David McCallum lives to organise another social function as Alex Papanis rescues him from a mock laboratory fire during the Division of Mineral Products' barbecue.

Safety first for social boss

Several social functions marked the last days of the Division of Mineral Products, which was merged with the Division of Mineral and Process Engineering on January 1 to form the new Division of Minerals.

The Division of Mineral Products had been at Port Melbourne for 30 years. A barbecue at the site on December 12 featured awards to staff and a mock rescue operation.

The Chief of the Division of Mineral Products, Dr Tom Biegler, presented Dr Angelica Vecchio-Sadus from Aluminium Production with the award for the "Best Occupational Health and Safety Suggestion".

She proposed an annual event similar to the Clean Up Australia campaign but directed at old or unused chemicals and equipment.

The Best Work Area award went to Dennis Peebles for the Carpentry Shop.

In the rescue, Jamie McLeod and Alex Papanis evacuated David McCallum from a mock fire in a laboratory. David was fitted with an oxygen mask and no chances were taken with his safety — as the Port Melbourne Social Club President he was needed to organise the End-of-DMP Wake, held safely and successfully on December 22.

Although business will continue as usual at the Port Melbourne site over the next few years, the operation will eventually be relocated to the major CSIRO site at Clayton.

Step-by-step to better field trials

A joint effort between CSIRO and the Australian Centre of International Agricultural Research has resulted in a new book that describes in an easy-to-read, logical way the step-by-step process needed to obtain the best results from field trial plantings of trees.

The book, *Experimental Design and Analysis for Use in Tree Improvement*, was written by the Division of Forestry's Dr Emlyn Williams and Dr Colin Matheson.

Dr Williams says the book originated from a series of two-week courses that he gave in China (with Dr Matheson), Thailand and Kenya on behalf of ACIAR. The experience gained enabled the authors to design the book to be most useful to experimenters involved in forestry field trials in Australia and abroad.

"The procedures we offer in the book are based on over 20 years' experience with such trials in several countries," says Dr Williams. "By using the designs advocated in the book, trials can be roughly 25 per cent smaller for the same level of precision. If you translate that into land, resources and maintenance, the savings are enormous."

Although the book uses forestry examples, the statistical methods and computing techniques are equally applicable to agricultural trials.

CoResearch
No. 361 April 1995 CSIRO's staff newspaper
CSIRO AUSTRALIA

Food scare prompts a flood of enquiries from the public

Food safety has been on people's minds since the poisoning scare in Adelaide earlier this year. CSIRO's Division of Food Science and Technology and Corporate Public Affairs have been at the forefront in giving the public and media accurate information about *E.coli* and fermented meat products.

During February, Corporate Public Affairs' monitoring service picked up 168 print articles and 908 radio and TV reports on fermented meat.

Dr Michael Eyles, from the Division of Food Science and Technology, used this daily service to keep on top of the issue.

For Michael, a flurry of media activity started on February 6, the day of the Melbourne opening of *EatSmart*, the new CSIRO interactive food exhibition.

Strategy

A quickly assembled communication team, headed by Michael, worked out a general media strategy. The team included Jan Tennent from Animal Health, Fred Grau and Barry Shay from Food Science and Technology and Christian Peterson from Corporate Public Affairs.

Dr Chris Mallett, the Chief of the Division of Food Science and Technology, was kept constantly informed. Dr Mallett joined a number of telephone hook-ups that brought together the team members, sometimes located in three or four states.

Dr Mallett's primary concern was to get accurate and timely information to the public, the media, the meat industry and CSIRO's stakeholders.

"I believe CSIRO had an obligation to moderate the debate to help avoid sensationalism that distorted the issue," he says. "We definitely had to be the 'honest broker' in this important issue."

The team highlighted in the media two recent *E.coli* surveys and the $820,000 research program into meat safety that CSIRO started last August.

More importantly, consumers were informed how to avoid food poisoning from incorrectly handling and cooking meat.

"It's the first time I've worked with Corporate Public Affairs on a major issue," Michael Eyles says. "At times the pace was fast and furious, but it was great to have people who listened to our communication problems, and were experienced in working with media.

"Having your first major media christening with *Four Corners* was a bit daunting. It was perfect training for the media calls that followed. The communication team developed a communication strategy that worked well."

The strategy included an extensive briefing of Mick O'Donnell from *Four Corners* and Norman Swan from Radio National, as well advising the relevant Ministers and creating a Foodline for the public.

An information sheet, *What can you do About E.coli and Other Food Poisoning Bacteria*, was prepared.

Brigitte Cox, the Division's Liaison Officer, sent out the information to her network of people in print, radio and TV.

The communication strategy created a huge demand for information on bacteria in meat and how to handle food in the home. After one mention of CSIRO's telephone number on *Four Corners*, 600 calls in one afternoon alone swamped the Melbourne office of CSIRO's Information Network.

To handle future information demands, CSIRO Information Network established Foodline, a 0055 number, based on the information sheet.

Michael Eyles has only one regret: he is now the "proud" carrier of a mobile phone, thanks to sound advice from Corporate Public Affairs.

—Christian Peterson

For information on what you can do about E.coli and other food bacteria in your kitchen, please ring the CSIRO Foodline on 0055 15689 (70) A.AA25¢/21.4 sec premium.

EatSmart exhibition at Westfield Shopping Town in Melbourne: interactive games and quizzes

Healthy eating show goes on the road

***EatSmart*, an interactive food exhibition that helps consumers understand more about healthy and safe eating, began its national tour in February at Westfield Shopping Town in Melbourne.**

The exhibition highlights the CSIRO 12345+ eating plan, which gives all the vitamins, minerals, protein and fibre the body needs, without excessive carbohydrates, fat or salt.

In the Virtual Kitchen, members of the public can design their own imaginative and delicious breakfast, lunch or dinner and check out the nutritional value of their selection according to the CSIRO 12345+ eating plan.

***EatSmart* also provides information on safe food storage, handling and cooking to help prevent food poisoning.**

Over the next few months *EatSmart* will be visiting the Royal Easter Show and the Powerhouse Museum in Sydney, and Westfield Belconnen in Canberra.

It will also make a welcome return to the National Science and Technology Centre in Canberra, where it had a very successful stay earlier this year. The centre's Exhibition Co-ordinator, Robin Lendon, praised *EatSmart* as "very impressive and very visual".

"I loved the humour and variety evident in the Virtual Kitchen," he says. "I was sorry to see it go."

CSIRO staff who have worked with *EatSmart* report the popularity of its interactive games and quizzes. They say working with the exhibition is an enjoyable break from their routine and that their role is greatly appreciated by visitors to the exhibition.

Staff meetings on evaluation

A discussion paper containing the findings of the Board evaluation of CSIRO's structure and way of doing business will be released in late March.

To give staff the opportunity to comment on the discussion paper and raise any queries, a series of staff meetings will be held in major capital cities, beginning in about mid-April.

The Acting Chief Executive, Dr Roy Green, will attend each of the meetings to hear staff views and answer questions. It is also expected that at least one Board member will attend.

Dr Green will also be holding workshops with Program Leaders on the Discussion Paper.

A schedule of the meetings will be released in early April, but was not available at the time *CoResearch* went to press. A video will be made of one of the meetings so that staff unable to attend will see the presentation from Dr Green and the reaction of some of their colleagues.

We're here to serve, says John Stocker

Dr John Stocker ended his five-year term as CSIRO Chief Executive on March 3. Roy Green has now been confirmed as the acting Chief Executive. Dr Stocker has returned to private industry, joining Pratt Industries, where he will be responsible for developing the group's technology and innovation strategy — particularly recycling technologies.

In this interview with *CoResearch*, Dr Stocker answers a representative sample of questions submitted by CSIRO staff throughout Australia.

Q. Of initiatives that you took at CSIRO, which was the most most essential to our long-term success?

A. I believe the single most important activity was getting absolutely clear what our mission is: namely, to serve as the world's most effective multidisciplinary research organisation. That was very important because it declares that we're not in business to perpetuate our own existence, we are here to serve. All other activities within CSIRO, relating to its effectiveness and delivery, derive from that statement.

One of the ways we have served is to provide objective environmental advice on important issues like pulp mills and so forth, but sometimes our commercial partners have a vested interest in some of those issues. How are we going to reconcile those two aspects?

They are both firmly in our charter. The Act under which CSIRO works says that it will be transferring its technology to business, and these days that really means writing business contracts. And our Act also requires us to do environmental research. So CSIRO has to meld the opportunities represented by those two areas.

We can do that by marketing our capabilities as an impartial and capable scientific research organisation, by making sure that the contracts we draw up with business — particularly in areas where they impinge on environmental considerations — preserve our right to publish important public interest findings, and that we are vigilant about keeping our obligations to provide the government with clear, impartial advice separate from any commercial imperatives. I think the resolution of the potential conflict will be greatly facilitated by a clearer statement for CSIRO of what our performance indicators are.

Would we have been better off, instead of trying to comply with the 30 per cent external earnings requirement that the government put on us, to spend our time explaining why the requirement was inappropriate to CSIRO?

I think it is appropriate for CSIRO to work to a target for external earnings. I read very carefully the most recent independent appraisal of this target, the ASTEC Report, and agreed with many of its findings. ASTEC found that the 30 per cent external earnings target has been a necessary stimulus to CSIRO getting closer to many of the industry groups that it needs to serve, but that in itself the target is an inadequate performance indicator for the organisation.

Just getting 30 per cent of the money into the organisation is certainly not an adequate statement of success or failure. It has been a valuable target, but it needs to be supplemented by a lot of other more meaningful indices of performance.

You have said in a number of places that government needs to take science seriously and that Australia as a nation needs to take science more seriously — that we value our sportsmen very highly but not our scientists. Do you think that one day we'll have a senior enough voice in Cabinet to make the government take us more seriously?

CSIRO has got now the huge advantage of having a very senior Cabinet minister and a member of the Expenditure Review Committee as the Minister for Science — Peter Cook. I have been very pleased that he has been extremely open to input from CSIRO and from me personally, and I think that his forthcoming Innovation Statement is a statement from him that this is a vital issue that is electorally an important issue as well. That gives CSIRO and other sources of innovation in Australia a unique opportunity, which they must grab.

Do you think senior CSIRO staff and the board have been responsible for a deterioration in the relationship between CSIRO and government?

In our Board Evaluation Committee musings of the last few months we have looked at what our stakeholders think of us as an organisation, and perhaps the most gratifying input has come from government departments, which have given CSIRO a very big tick. Our stakes with government seem to have never been higher, and the review that has just been completed testifies to that. So I think there's no credibility whatsoever in that assertion.

Do you do a PPE and, if so, who assesses it?

Yes. The Chief Executive nowadays has a performance agreement and under that agreement is required to undergo PPE like any other staff member. There's a sub-committee of the Board that is charged with assessing the performance of the Chief Executive. That sub-committee is chaired by Adrienne Clarke, with whom I sit down and go through objectives, and achievements against objectives.

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Dr John Stocker addresses a farewell function organised by Canberra staff. Dr Glen Kile, Chief of the Division of Forestry, looks on.

Letters to the Editor

I wish to respond Dr Stocker's column in the last issue of *CoResearch*, (No 360, February 1995). His description of the Senate Inquiry into rural research as a "rather odd process" is a trite, shallow and unworthy statement.

It should be noted that the cause of the Senate Inquiry was the appalling mismanagement, by IAPP senior management, of the response to a series of financial cutbacks. They failed to properly consult with industry stakeholders, let alone staff, and as a consequence of public and staff pressure the Senate acted. To me it seems odd that Dr Stocker, as a public official, should be so dismissive of taxpayers' representatives looking at problems in a taxpayer-funded operation.

For those who have not read the Senate Inquiry Report (which was multi-party and unanimous) and to correct the inaccuracies in Dr Stocker's column; the final report was well structured, with a collection of considered responses from responsible internal and external stakeholders, and made a set of consistent recommendations.

It is unfortunate that Dr Stocker chose to hide behind Senator Cook's statement and I hope that his comments will not unduly influence the Board Evaluation Committee's consideration of the report. This is only the latest in a series of disparaging statements concerning the Senate Inquiry from many levels of management, basically because they don't like the outcome.

Steven Davis
Division of Tropical Animal Production
Long Pocket Laboratories
Indooroopilly, Qld

In response to Kurt Cremer's assertions about the terrible threat posed by seedling willow colonisation of Australian rivers (*No sex please; they're from New Zealand*, Issue 358), I have the following comments to make:

1. (tongue in cheek) I thought Australia was suffering from severe drought — ie, you have no water in your rivers anyway. Willows require plenty of water to survive!

2. Your waterways are usually colonised by *Casuarina* and *Eucalyptus* and many other well-adapted and tough Australian plants. All they need is fencing to exclude cattle and sheep from the riverbanks.

3. We have been telling our river engineers for the past 25 years to use only male willows for riverbank protection planting. You should be doing the same.

4. You should not be discriminating against New Zealand-bred *Salix matsudana x alba* hybrids. If there truly is a problem in Australia you need to first remove all female tree willows from waterways and then ban planting of all female and hermaphroditic clones of willow species. Where you want to stabilise a streambank, use smaller shrub willows. Large male tree willows still have a useful role to play in protecting stopbanks (levees) and diversion groynes from serious damaged in major floods.

5. Apart from their uses as shade trees, windbreaks, ornamentals, spring sources of nectar for honey bees, riverbank protection and erosion control, willows are being tested in plantations irrigated with city or industrial waste water to produce woody biomass for electricity cogeneration plants in the United States and Europe. In Argentina there are 100,000 hectares of tree willows planted for the production of newsprint and high-quality papers. In New Zealand we are investigating these uses and also the nutritional and health value of willow coppice shoots to cattle, deer, goats and sheep.

Willows are truly useful multipurpose trees and should not be treated as weeds!

Best wishes to you and all our Ozzie competitors.

Allan Wilkinson
Scientist (Poplars and Willows)
Aokautere Research Centre, New Zealand

Triple win in 1995 Australia Prize

Three CSIRO scientists and an American academic have shared the 1995 Australia Prize, which honoured achievement in the field of remote sensing. Their $300,000 prize will be presented at a ceremony in April.

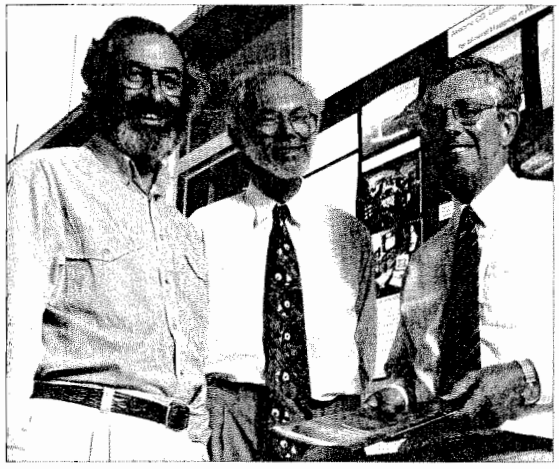
Dr Ken McCracken, founding Chief of CSIRO's Division of Mineral Physics, and his colleagues Dr Andrew Green and Dr Jonathan Huntington, of the Division of Exploration and Mining, were named on February 3 as winners of this prestigious prize, which they share with Dr Richard Moore, Emeritus Professor of Electrical and Computer Engineering at the University of Kansas.

Their work provided the foundation on which much of Australia's remote sensing has been developed, and helped to establish remote sensing as an integral part of Australia's mineral exploration industry.

The Australia Prize is an international award, conferred by the Australian Government, for researchers who have made outstanding contributions to science and technology promoting human welfare. The prize was instituted in 1989 by the then Science Minister Barry Jones.

Each year a different category is honoured. The 1996 prize will be awarded in the field of pharmaceutical design, and nominations close on July 31.

This is the second time that CSIRO scientists have won the Australia Prize. The first was in 1992 for *Coalscan*, technology for on-line analysis of minerals, moisture and ash in coal.



Prize winners Jon Huntington, Andrew Green and Ken McCracken

Announcing this year's winners, the Federal Minister for Science, Senator Peter Cook, said: "Dr McCracken, an astronomer, Dr Green, a physical chemist, and Dr Huntington, a geologist specialising in air-photo interpretation, have brought complementary skills to a new area of research. In the face of initial scepticism, they have persuaded Australian mineral companies that remote sensing could be a powerful new tool for mineral exploration."

Springboard

Senator Cook said their work had been the springboard for Australia to extend its use of satellite imagery to monitoring of overgrazing, erosion, flooding and fire damage, the development and health of crops, and mapping ecosystems.

Dr John Stocker, CSIRO Chief Executive at the time, said: "Bringing together different skills to solve scientific and technological problems in the national interest has always been a major strength of CSIRO.

"Largely as a result of their work, Australian exploration companies are now the most sophisticated users of remote-sensing techniques and data in the world."

Before joining CSIRO in 1970 as chief of the new Division of Mineral Physics in Sydney, Dr Ken McCracken was Professor of Physics at Adelaide University. He had been involved in space science since 1959, when he was a post-doctoral fellow at the Massachusetts Institute of Technology.

His first official task for CSIRO was to attend a research meeting in Canberra that was preparing Australia's response to a NASA invitation to make use of satellite images of Australia obtained by its recently launched Earth Resources Technology Satellite — later renamed LANDSAT.

Dr McCracken said: "I knew nothing about remote sensing, but I had been building satellites for 15 years and knew of the enormous revolution they had brought to communications. It was clear to me that if somebody could put an eye into a satellite orbiting 800 kilometres above the earth, it would be another sea change in technology."

Dr McCracken made two key appointments during the next four years: Australian spectroscopist Dr Andrew Green in 1972, and British-born geologist and air photo expert Dr John Huntington in 1974.

"We took a calculated gamble in predicting that the satellite revolution would be of great benefit to the minerals exploration industry."

Rejected

The team's initial submission for funding from the Australian Minerals Industry Research association was rejected because the industry saw little value in the new technology. In 1977, a revised submission received enthusiastic support.

"Our success has been based on our ability to find new ways to express and enhance subtle geological features present in satellite data," says Dr Green, who has been Director of the Co-operative Research Centre for Australian Mineral Explorations Technologies since 1992.

Dr Jonathan Huntington, senior principal research scientist with the Division of Exploring and Mining, sees remote sensing as "very much a hybrid subject".

"It has been enormous fun doing the research," he says. "I enjoy working beside scientists whose science is foreign to me, but who need me as much as I need them."

Most recently, Dr Green and Dr Huntington have been involved in the development of the world's first pulsed-laser profiling spectrometer. The instrument, carried by low-flying aircraft, can identify silicate and carbonate minerals that make up most rocks, and help detect patterns that may indicate mineral deposits.

Dr McCracken, who convinced CSIRO to establish its Office of Space Science and Applications, which he directed until his retirement in 1989, is now a beef grazier and a private consultant to the minerals exploration industry.

He firmly believes research is the key to the competitive industries of the future. "The challenge for our research managers is to know what to back when everyone seems to disagree with them," he says.

Dr Richard Moore, the other winner, is a pioneer in the field of microwave-based satellite remote sensing, and a prolific inventor of new remote-sensing devices that have helped revolutionise mapping and monitoring the earth's surface.

Best showcase for research

Australia may the Hanover Fair of the Asia Pacific through a proposal now being led by a group of senior business, government and science figures.

The idea is a biennial expo of science and industry to be known as *Best* — Best Engineering, Science and Technology. *Best* will help make Australia a meeting ground of science and business in this region.

CSIRO's Director of Corporate Business, Peter Bradfield, is a member of the Board of *Best*, which is chaired by John Ralph, the former Chief Executive of CRA. The Board also includes former Senator John Button and chief executives of several leading private and government business organisations.

Best is intended to build up to a major showcase of science and technology in 2000, the year of the Sydney Olympics. This will help Australia take advantage of the massive international attention to market itself as an excellent location for research and development.

Peter Bradfield: biennial expo

Mr Bradfield said the project was conceived in the Corporate Business Department as part of the Melbourne Head Office's new approach to doing business — outward looking, internationally oriented and strongly focused on interaction with industry.

Best will comprise conferences, exhibitions and site visits in specific sectors, and will encourage cross-fertilisation between sectors and disciplines. State and Federal governments (including Austrade) will target their overseas visitor programs at *Best,* to give a strong presentation of Australia's R&D capabilities, instead of the current ad hoc approach.

Four Melbourne-based universities, the Victorian Government's Departments of Tourism and Business and Employment, the Institution of Engineers and the Commonwealth Department of Industry, Science and Technology have invested $20,000 each to develop the concept.

Mr Bradfield said the impact of *Best* on Australia's technological profile in the Asia-Pacific has obvious spin-off benefits for CSIRO, and our involvement will provide a new network to enhance interaction with industry.

Stirring experiment at Chaffey Dam

A TEAM headed by CSIRO's Dr Bradford Sherman is using a compressor and 700 meters of piping to pump air into the bottom of the Chaffey Dam, neat Tamworth in New South Wales, in a three-year experiment designed to identify new techniques for improving water quality.

The problem in Chaffney is that potentially dangerous blue-green algae thrives in the top warm layers while the cool lower layers' lack of oxygen results in high concentrations of iron and manganese. Both conditions make the water unfit for consumption. Destratifying the water by mixing would remove the top warmer layer and increase oxygen lower down.

Although Dr Sherman expects no easy solutions, the $600,000 experiment is expected to provide insight into managing destratification of water storage in Australia's warmer regions.

Aquaculture research centre opens

A NEW Co-operative Research Centre for Australian Aquaculture at the Fisheries Research Institute in Cronulla, New South Wales, was opened on February 21 by the Federal Minister for Resources, David Beddall.

Aquaculture is Australia's fastest-growing primary industry and is expected to be worth $500 million by the year 2000. The industry produces and exports mainly high-value species and luxury products from more than 60 cultured species, including prawns, salmon, tuna, abalone and oysters.

Short shots

Demand already exceeds supply and if Australia cannot meet it soon, other countries will. The CRC's research program is working in almost every sector of the aquaculture industry with 27 different projects, from manufacturing feed for ranched tuna to harnessing natural bacteria to reduce the need for antibiotics in fish farming.

Revealing secrets of the rainforest

CSIRO is developing a world-class rainforest interpretive display for Barron Falls Station on the new Skyrail cableway in far north Queensland.

The $30 million Skyrail cableway, due to start operating in August, will carry more then 260,000 people a year over the 7.5km route from Smithfield, a suburb of Cairns, to Kuranda, a village in the rainforest. Barron Falls is one of two stops along the way.

Skyrail is building a $650,000 interpretive centre building to house the CSIRO display. After skimming over the rainforest, tourists will alight at the centre and enjoy a integrated display that will combine interactive computer programs, digital sound recordings, high-quality graphics and lifelike items from the rainforest.

Key themes will explain why tropical rainforests are such a rich and diverse ecosystem, explore the forces that have an impact on the system and reveal some of the hidden features that make the rainforest a unique and exciting place.

How useful are trees on farms?

SCIENTISTS at the CSIRO Division of Water Resources began a National Tree Survey in February. Thousands of tick-a-box surveys have been sent to farms throughout Australia, and the answers will help build up a picture of successful tree-planting strategies.

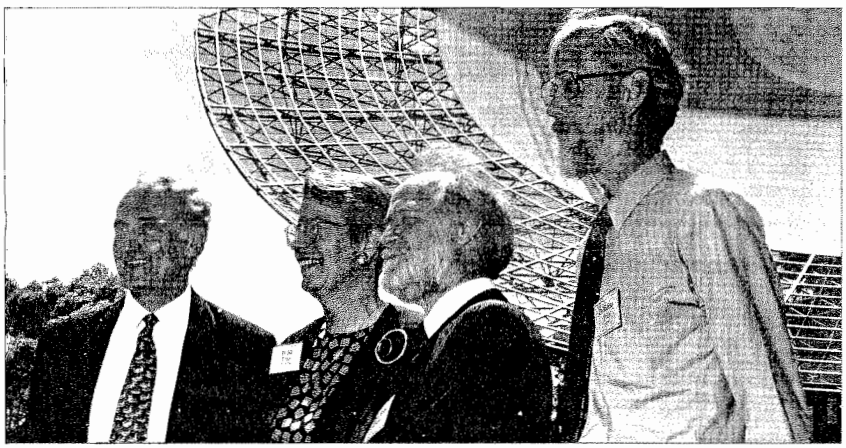
It is hoped that, among other things, the survey will settle the contentious issue of whether trees should be planted on discharge sites to treat dry land salinity. Such planting has worked well in some areas and failed in others.

Laboratory upgrade in Townsville

DAVIES Laboratory in Townsville is undergoing a $2.2m upgrade, in line with its strategic importance as a CSIRO research facility in northern Australia.

The laboratory's OIC, Dr Ross Coventry, says the complex had become shabby and rundown and staff are excited about the building project. "The new construction will help us carry out sophisticated research projects with other research centres in Australia and overseas," he says.

CSIRO research in the region has been of critical importance to northern cattle and cropping industries.



Launch of the SETI project at Parkes Observatory: From left, Robin Williams (ABC), Dr Jill Tarter (SETI Institute), Prof Ron Ekers (Director of ATNF) and Dr Marcus Price (OIC Parkes Observatory)

Time for ET to phone home

US scientists have begun a search for extraterrestrial life, using CSIRO's Parkes telescope in western New South Wales.

The search, called Project Phoenix, began in February. It will be conducted by scientists from the SETI (Search for Extraterrestrial Intelligence) Institute, who will look for specific types of radio signals that appear to be from technology similar to our own.

The co-ordinator of the Australian side of the project, CSIRO's Dr Kelvin Wellington, says: "The SETI people are going to look at about 1000 stars in all. They have come to Australia to study 200 stars that can only be seen from the Southern Hemisphere. CSIRO has the best telescopes for this part of Project Phoenix."

The scientists will be looking at nearby stars similar to the Sun, in the hope that these might have planetary systems that host advanced civilisations.

As stars, galaxies and other objects in the universe produce their own natural radio signals, looking for the artificial signals from the technology of other civilisations is like looking for a needle in a haystack.

However, man-made signals from television stations, military radar and communication satellites will be weeded out with the help of a second CSIRO telescope near Coonabarabran, 250km north of Parkes.

The SETI Institute's contract with CSIRO will bring more than $2 million to the Australian economy. The cost of the search has been reduced by special equipment designed and built by CSIRO that converts radio signals from space over a very wide range of wavelengths into electrical signals.

The receiving equipment divides the incoming signal into more than 28 million channels and will look at each channel about once a second.

Most scientists believe that the idea of searching for radio signals is reasonable. Even if interstellar travel were possible for an extraterrestrial civilisation, it would be cheaper and quicker to communicate by radio.

Project Phoenix is a direct descendant of a NASA program cancelled by the US Congress in October 1993. The SETI Institute, a non-profit organisation, raised funds from the private sector to continue the search.

A chance to refine your media skills

The CSIRO Media Skills Course is being run again this year, to help scientists take their message into the community.

It will be conducted by CSIRO communicators Jenni Metcalfe (Division of Tropical Crops and Pastures) and Toss Gascoine (Centre for Environmental Mechanics), who developed the course in 1992.

The scientific approach is often at odds with the media's need to get to the point simply. The media course aims to demystify the media's *modus operandi*, to introduce scientists to working journalists and to give scientists interview experience with print and electronic media journalists.

It covers topics such as media releases and staging a launch, with separate sections on radio, television and print media.

Brochures about the course are available from Divisional Communicators or Personnel Officers.

This year's course dates are:

Media skills — Canberra, May 4–5 (register by April 20); Melbourne, May 22–23 (May 8); Sydney, June 26–27 (June 12); Brisbane, July 24–25 (July 10); Perth, August, 14–15 (July 31); Canberra, September 7–8 (August 24); Adelaide, October 16–17 (October 2)

Presentation skills — Canberra, April 27-28 (register by April 13); Melbourne, May 25–26 (May 11); Sydney, June 29–30 (June 15); Brisbane, July 27–28 (July 13); Perth, August 17–18 (August 3); Adelaide, October 19–20 (October 5); Sydney, October 23–24 (October 9); Melbourne, November 13–14 (October 30).

Aerospace work on display at airshow

CSIRO's contribution to the aerospace industry is being highlighted in an Institute of Industrial Technologies display during the Australian International Airshow at Avalon airfield from March 24 to 26.

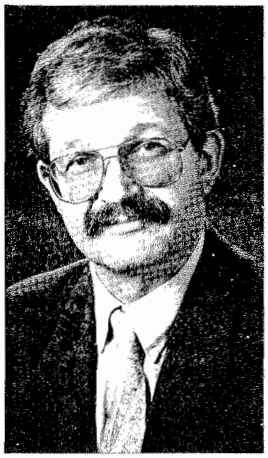
The show enables CSIRO to demonstrate its expertise to leading local and international manufacturers and customers.

The display will emphasise three areas of CSIRO research: the development of advanced materials for aircraft construction; unique capabilities in testing and characterisation of materials; and machine vision and manufacturing systems work that is helping business improve efficiency in manufacturing and service industries.

Members of the public will be invited to make a paper plane, the CSIRO Flier, while also enjoying the display's more traditional aspects, such as text, photographic and sample product exhibits.

The display will also be taken to the Australian Science Festival in Canberra in May.

New Director eyes world-best target



Dr Chris Mallett: "A privilege to lead the Institute"

Dr Chris Mallett has been appointed as the new Director of the Institute of Animal Production and Processing.

Dr Mallett came to CSIRO from industry only a year ago as Chief of the Division of Food Science and Technology. He brought with him leadership and managerial experience in a range of companies in the food industry, including an impressive record as a general manager of the innovative Birds Eye Wall's in Britain, and radical ideas for applying R&D to enhance industry competitiveness.

As Chief of the Division of Food Science and Technology, Dr Mallett took several initiatives to improve the Division's business performance. These included reorienting the Division and focusing its mission, vision and operating principles on external corporate customers, and initiating a strategic review of the Division's research infrastructure. He also contributed to the Prime Minister's Science and Engineering Council's Working Party on *Food in Asia*.

Dr Mallett, who takes up his new post in April, says his key challenge is to pursue CSIRO's goal of becoming the world's most effective and efficient scientific research organisation.

"I am working in an Institute where there are many examples of Australia being the leading, most effective and efficient producer of particular materials," he says. "It is a privilege to be allowed to lead the Institute and the real work is to build the disciplines in the Institute and to focus on its application to benefit Australian industry and the public."

Dr Mallett strongly supports a free-flowing exchange of staff between CSIRO and industry. Speaking of his time as Chief of the Division of Food Science and Technology, he says: "We have had a number of people in the Division seconded to some of our major customers to learn more about their operation and to understand the context in which our research work is applied."

Dr Mallett sees today's CSIRO as a dynamic, forward-looking organisation. He says: "I think CSIRO is now much more flexible, and given that its mission is to become the most effective research organisation, it requires both scientists of exceptional talent on the one hand but also people who are able to manage the interface between science and industry.

"I think it is still possible to have a very satisfying and enjoyable career in CSIRO. But, I think the attitude that 'you now have a job for life and we'll put you in a laboratory and let you get on with science, just let us know when you want your retirement' is well past, and those days will not return."

Off to the revolution

Dr John O'Sullivan, the Deputy Chief of the Division of Radiophysics since 1989, has left CSIRO to join News Limited as Technology Director.

He will be involved in the very sophisticated technological innovation demanded by contemporary mass media, especially in Pay TV, information services and infotainment technology.

As Deputy Chief of Radiophysics, Dr O'Sullivan saw himself as principally a co-ordinator responsible for the overall management of the various scientific activities of the Division.

"The major thrust of what I was doing was to bring the various parts of the Division together," he says.

Dr O'Sullivan was instrumental in establishing new structures so that different parts of the Division could more effectively combine on big projects. One of the major projects was to develop high-speed wireless computer networks.

Dr John O'Sullivan: "There's part of me that's sad to go"

"The Division had very strong antennae research work, strong signal processing, and also had people doing great work on the design and prototyping of radio integrated circuits. So we started a project to work on particular radio or wireless applications, the major one being wireless connection of computers.

"These were wireless networks that were aimed at providing capabilities up to and including multimedia, which was way beyond what other people were talking about — up to 100 megabits per second — and going to frequency ranges that went well beyond what anybody else was talking about. This took the Division to a world leadership position."

Before joining the Division of Radiophysics as Principal Research Scientist in 1983, Dr O'Sullivan was head of the Engineering Department of the Netherlands Foundation for Radio Astronomy.

He says his involvement with CSIRO has been challenging and rewarding. "And I've enjoyed the company of the people," he says. "So, there's certainly part of me that's sad to go and there's part of me that's sad I won't be part of the future there.

"I feel confident that from the Division of Radiophysics' point of view, there are bigger and brighter things ahead. On the other hand, I'm somebody who looks forward to change and new things. I'd like to be part of the new information revolution."

Communication review

As part of its evaluation of CSIRO's structure and way of doing business, the Board has decided that a review of CSIRO's internal communication procedures is needed.

In particular, the Board wants to examine the effectiveness of current mechanisms used for:

- transfer of information on key Board and Executive decisions to staff and management; and
- the two-way flow of information between staff and management, and between groups across the organisation.

A task force has been established to oversee this review. It comprises Dr Tom Biegler (Division of Minerals), Dr Simon Carroll (Division of Biomolecular Engineering), Dr Pauline Gallagher (Division of Animal Health), Ms Wendy Parsons (Institute of Natural Resources and Environment) and Mr Lindsay Bevege (Corporate Public Affairs), who will act as Secretary.

The task force has engaged Mr Steve Bright of Catalyst Communication to assist with the review. Mr Bright's proposal was selected from five invited expressions of interest to undertake the review.

Over the next month Mr Bright will conduct interviews with a range of staff as well as several focus group discussions.

Any staff with a particular interest in the review are encouraged to contact Lindsay Bevege or any other of the task force members. Mr Bright's report will be made available as a discussion paper before going to the Executive Committee and the Board.

McLennan award nominations open

Nominations are being called for the Sir Ian McLennan Achievement for Industry Award. This annual award is made to CSIRO scientists and engineers whose achievements have been of benefit to Australian industry.

Winners receive the Sir Ian McLennan Medal and a grant of up to $15,000 for an overseas study tour related to their achievement. This year's award will be presented at a lunchtime ceremony in Sydney in October.

Last year there were joint winners, Dr Raymond Smith and Dr John Possingham. Dr Smith and his Lateritic Environments Team from the Division of Exploration and Mining were recognised for their contributions to the Australian mineral exploration industry. Dr Possingham, who used to lead the Division of Horticulture, won for his contributions to Australia's grape-growing and wine industries.

Brochures explaining the award have been sent to all sites and nominations close June 30.

For more details, contact Karen Robinson, CSIRO Corporate Communication, PO Box 225, Dickson, ACT 2602; phone (06) 276 6108, fax (06) 276 6641.

'Zimmie' awarded CSIRO Medal

"Dr Elwood Zimmerman," said John Stocker, "is one of the true believers."

In his last public appearance in Canberra, the out-going Chief Executive presented a Special CSIRO Medal to "Zimmie" (as he is known to friends and colleagues) in recognition of an extraordinary career in science.

At 82, Zimmie has produced some 10,000 pages of scientific information. His masterwork is the eight-volume *Australian Weevils*, launched in February 1994 by the then Minister for Science, Chris Schacht.

According to Zimmie, he has catalogued and described 4000 species of Australian weevil — and there may be as many as 6000 species to go!

Australia has a unique profusion of weevils, and in Zimmie, said Dr Stocker, they have met their match.

John Stocker with Elwood Zimmerman at the medal presentation

Zimmie was born in Spokane, Washington, in 1912. He says that he had decided to make insects his life study even before he left high school. He went on to the University of California, where he wrote his first scientific paper before he finished his first year.

His first scientific appointment was as field entomologist at the Bernice P. Bishop Museum in Hawaii in 1934. Twelve years later he became the museum's Curator of Entomology. During this time he wrote the definitive nine-volume *Insects of Hawaii*.

Among the specialists, there has never been any doubt that Zimmie's *Australian Weevils* is a major contribution to science, and in particular to the study of biodiversity.

But there is more to *Australian Weevils* than mere taxonomy. Zimmie's fellow entomologist, and feared critic, Roy Crowson of Glasgow wrote in a review:

"Dr Zimmerman never forgets that the study of *Curculionoidae* is a human activity; he writes in the manner of a cultured human being, not a computerised committee, with many personal touches, literary quotations and figures of speech; such qualities are too rarely seen in the major works of scientific specialists of any variety, and make for unusual pleasure in reading this one."

Zimmie joined CSIRO in 1973. He became a Senior Research Fellow with the Division of Entomology, and Curator of Weevils for the Australian National Insect Collection. He retired, officially, in 1982. In practice, he has continued to work with the Division (according to local legend, 12 hours a day, seven days a week) as an Honorary Research Fellow.

In the preface to *Australian Weevils*, Zimmie wrote:

"... one of the greatest rewards of being a systematic entomologist is that when one gets old with at least some of the vital senses intact, one need never want for something new and stimulating to do, and one can look forward in eager anticipation to what exciting, previously unknown fact or organism may come to greet tomorrow's sunrise. How fortunate it is for one to be able to do so."

—Nick Goldie

'Board should have power to sack'

from page 2

I think the drawback of the CSIRO Act at the moment is that the Board doesn't have the ultimate authority to assess the performance of and if necessary fire the Chief Executive. This is a prerogative of government. I believe the Act should be changed to make the relationship between the CSIRO Chief Executive and the Board the same as is usual in all private corporations and many government agencies, where that authority is vested with the Board.

Now that you are leaving CSIRO a few other people are wondering whether CSIRO is still worth working for.

CSIRO is a great national resource and a tremendously important national organisation. I think that it is most certainly worth working for, and the next chapter of my life in industry will be very much trying to utilise the resource that is represented by CSIRO to meet corporate objectives. I think the flourishing of CSIRO that I foresee in the next five years will be due to people in industry taking a greater interest in its workings. It will only be able to be effective in this context if the people in CSIRO can be highly motivated and can work to shared objectives. It will be part of my job to interact with people in the organisation to set and agree upon objectives, and see that they are met.

What do you see as the greatest barriers to that sort of positive future for CSIRO?

This is an issue that the Board sub-committee has confronted in the organisation's evaluation. I think that divisiveness, the setting-up internally of boundaries that get in the way of us being the world's most effective multidisciplinary research organisation, are the main threat.

Externally, I think it is all the caterwauling that goes on about CSIRO from ginger groups, and other lobbies who have long looked with jealous eyes upon the government appropriation we get and wanted it diverted into other areas. These are jealousies that are going to occur in any democracy. But if, as happened in New Zealand, the voices of doom win, there is a real danger that a structure as important as CSIRO will just be swept away in a flood of economic orthodoxy.

What was the best thing in your time as Chief Executive at CSIRO?

By far the best thing was getting out and meeting people, particularly at rather remote sites. Things like visiting the Australia Telescope at Parkes and getting up on top of the dish, going right up to Useless Loop in WA and seeing the burrowing bettongs taking their first tentative footsteps again on the mainland of Australia after extinction on the mainland.

Those things gave me a real buzz, as did going into laboratories in the Division of Radiophysics or Chemicals and Polymers, or a host of others, and actually sitting on a bench and talking to scientists about their work. Those certainly were more outstanding memories than any of the formal parades or presentations that I participated in.

What was the worst thing?

Missing the plane in Sydney on Friday evening when I was trying to get to Seymour to spend the weekend tending my grapevines.

With hindsight, would you still have joined CSIRO?

With hindsight, with foresight, with any other sort of sight. It has been one of the highlights of my career. I've benefitted enormously from it; I've learned a lot in my time in the organisation and developed a deep affection for it.

During your time here there was discussion about AIMS, ANSTO and AGSO, and whether CSIRO should subsume them. Do you think you should have seized those opportunities?

As Chief Executive of CSIRO, I've never felt in particularly acquisitive mode. I don't think bigger and bigger is better and better. In particular, I felt that the continuing separate identity of ANSTO, given the nuclear emphasis within that group, is good for ANSTO and probably good for CSIRO. In our submission to the McKinnon Review of Marine Science, we did make a case for AIMS being incorporated into CSIRO, and I still think that would be sensible, because it reinforces the multidisciplinary approach to science that CSIRO can muster, and also probably gives better career development opportunities for many staff members.

On the personal level, the job of Chief Executive is grinding long hours, you have to travel all over the country. How do you keep fit and healthy?

The single most important sanity factors in this job are having a family for which you find some time and also having a completely different and outside interest. I've got a fantastic family and a tenuous vineyard.

Are you looking forward to a quieter lifestyle in your new existence?

No, my new existence is showing every sign of being a very noisy lifestyle and one that will keep me running just as fast as I've ever run.

OBITUARIES

DR GEORGE MUNRO, a pioneer of ionospheric research, died on September 14 last year, aged 93.

Dr Munro was born in New Zealand and obtained his BSc and MSc from the University of New Zealand, Auckland College.

As a research scholar, he carried out experiments that led to his discovery of the ionosphere in the Southern Hemisphere.

This was published in the UK in 1926, the same year that he joined the UK Department of Scientific Research at Slough, where he was involved in research that was the basis of what became known as radar.

Dr Munro came to Australia in 1929 and joined the Radio Research Board at Melbourne University. His work provided valuable data for the planning of the national broadcasting network, as well as forecasts for Charles Kingsford-Smith's first trans-Tasman flight.

During the second world war, Dr Munro established and operated the Australian Scientific Liaison Office in London and then Washington. The initial emphasis of these offices was on radar but eventually the whole field of science was covered.

After the war, he headed the Sydney Radio Research Board until his retirement in 1966. His paper *Travelling Disturbances in the Ionosphere* gained him his doctorate of science from the University of New Zealand in 1951.

BRIAN POTTER, a highly respected physiologist who carried out extensive studies of salt and water metabolism in sheep, died on February 3.

In 1948 Brian joined the Division of Biochemistry and General Nutrition (now the Division of Human Nutrition), having obtained his BSc from the University of Adelaide in 1945. He was awarded an MSc in 1950.

Brian was elected a Fellow of the Royal Australian Chemical Institute in 1976. He retired from the Division of Human Nutrition in 1985 after a decade of work on various iodine deficiency projects.

A marathon effort in WA

A CSIRO team called *The Siromins* braved treacherous seas and other dangers to participate in the 20km Perth to Rottnest Swimming Race on February 18.

This event is becoming one of the world's most popular marathon swims, ranking with those around Rhode Island in the United States and across the English Channel.

The multi-division team was named after Siromin, a mineral additive/supplement for agriculture/livestock invented by CSIRO in Western Australia, and used extensively across the south and south-eastern areas of Australia. The swimming team flew a Siromin bag from its boat's mast as a flag.

The team's swimmers — John Bell, Simon Cook, Colin White (one of the inventors of Siromin) and Tim Wiese (a WA Agriculture Department adviser) — relied heavily on their colleagues' support for navigation, direction, sustenance and safety.

A constant shark watch from the front and back of the boat ensured no loss of life or limb, but little could be done about the menacing jellyfish stings. When Simon Cook received a bad sting in his mouth he was temporarily replaced by Tim Wiese, who was fighting his own problem of seasickness.

The swimmers alternated every 15 minutes and refreshed themselves with Colin White's "CSIROjuice" and his perfectly calculated energy replacement meals prepared by Forestry researcher Janine Catchpole.

Ingenuity and effort paid off and *The Siromins* completed the marathon in six hours, 48 minutes and 10 seconds.

Although international champions can cover the distance in four-and-a-half hours, it is considered an impressive achievement just to finish the perilous swim.

This year's participants included 90 four-swimmer relay teams, 25 duos and 25 individual competitors.

The Siromins swimmers and support crew, from left, back row: Sarah Davies, John Bell, Simon Cook, Tim Weise, Colin White, John Morgan and boat skipper Brian Whelan; front row: Elspeth Cook, Robyn Dynes, Narelle Chamberlain, Helen O'Donoghue, Peter Carrol, Janine Catchpole and Gonz Mata

Recognition from US

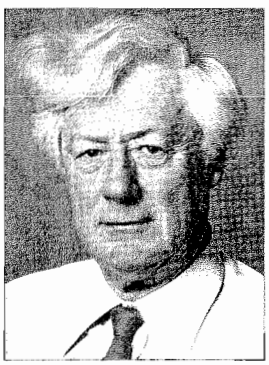
Dr John Philip, whose pioneering research in soil water hydrology and related fields has affected the design and operation of irrigation schemes around the world, has been made a Foreign Associate by the US National Academy of Engineering.

This honour has been conferred on only one other Australian, Sir Ian McLennan, a former chairman of BHP.

Dr Philip, who retired from CSIRO in 1992, had previously been elected to the Australian Academy of Science, the Royal Society of London and the Russian Academy of Agricultural Sciences.

The son of a dairy inspector in Ballarat, John Philip was a child prodigy who matriculated at 13 and graduated from Melbourne University as a bachelor of civil engineering at 19. A job as graduate assistant in agricultural engineering with that university found him spending much of 1947 at the CSIR Irrigation Research Station at Griffith.

Early in his career, he laid out the first stages of the Burdekin Irrigation Scheme in Queensland. In 1951 he joined



Dr John Philip: dedication

CSIRO's Division of Plant Industry in Deniliquin and began a phenomenal output of scientific papers.

His work replaced disconnected and often folkloric theories about the way water moves through soil with physically based mathematical descriptions.

In 1959 he became head of the Agricultural Physics section of the Division of Plant Industry in Canberra. In 1972 he was appointed foundation chief of the new Centre for Environmental Mechanics in Canberra. He held this post until he was made the inaugural CSIRO Fellow in 1991, except that from 1980 to 1983 he was foundation Director of the CSIRO Institute of Physical Sciences.

Dr Philip's 45-year career with CSIRO makes him one if its five longest-serving members. Although now formally retired, he puts in long hours at the Centre for Environmental Mechanics, where he is producing his 290th paper.

Dr Philip's relentless dedication to his work has not prevented him from cultivating various other interests: he is a published poet, an accomplished cook and a connoisseur of architecture. In the latter capacity, he brought into being the Environmental Mechanics building, regarded by many as the most architecturally successful laboratory in Australia, and has subsequently served as a judge of the Sulman prize for architecture.

Reconciling such seemingly competing interests is not difficult for Dr Philip. "I don't think they're very different, to be frank," he says. "I guess I get a lot of my kicks in life from, shall we say, pursuing the hunt for new connections and new insights wherever they are.

"It's all a matter of creativity and doing the most interesting things you can during your brief existence."

Noel's innings takes the cake

Noel Tregoning, Planning Data Analyst in the Strategic Planning and Evaluation Unit in Canberra, celebrated 40 years with CSIRO on February 22.

Fifty colleagues attended an afternoon tea in his honour, at which Arthur Blewitt, Director of Corporate Services, made a speech and presented Noel with a letter of congratulations from Dr John Stocker.

Noel began his career as a clerk at Head Office in East Melbourne. He remembers his first day as "a bit terrifying for a kid from the Gippsland bush". His first job, as the Records office boy, was to index the mail. "I got the staff clerk, Ian McKenzie Ross, mixed up with the Chairman, Sir Ian Clunies Ross, with the result that the Chairman got all the staff mail."

Noel has seen much change, particularly in technology, over the years. In 1955, he learnt how to operate the first photocopier at Head Office, which "involved intricate juggling with both positive and negative photographic paper". It had an output of 25 copies an hour.

A few years later, in the finance area, he had one of the first electric calculators — "a mechanical monster, weighing about 28 pounds, that went clack, clack, clack. More often than not, we would have worked out the equation on a jotter before it finally belted out the answers."

By 1972 Noel was promoted to Manager of the Overseas Accounting Unit in the Canberra head office Finance Section. In

Noel Tregoning cuts the cake to mark his 40th anniversary

1988 he became the Research Data Officer in the Corporate Finance Unit. In 1992, this position was transferred to the Corporate Planning Office, which became the Strategic Planning and Evaluation Unit after a 1994 review.

Surprised and touched by the afternoon tea, Noel realised that two-thirds of those present "weren't even a twinkle in their fathers' eyes" when he started at CSIRO.

Despite his own success as a long-term CSIRO employee, Noel regards the mobility of today's graduates as a good thing. "I don't think it is in theirs or CSIRO's interests to hang in there for 40 years with the one show," he says. "The type of experience we and they need nowadays can't be obtained in-house but comes from various areas."

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CoResearch
No. 362 July 1995 CSIRO's staff newspaper
CSIRO AUSTRALIA

New CEO appointed

An Australian scientist, Dr Malcolm McIntosh, has been appointed as the new Chief Executive of CSIRO.

The CSIRO Board selected Dr McIntosh from an outstanding international field of candidates. The recruitment process involved a rigorous national and international search, with a shortlist of 14 candidates interviewed in Melbourne, London and New York.

For the past five years Dr McIntosh has worked in Britain for the Ministry of Defence. At present he is the most senior non-British executive in the UK civil service. As Permanent Undersecretary of State for Defence Procurement, he is responsible for a budget of £10 billion, primarily for sophisticated technology, and a staff of up to 35,000.

Because of commitments in his current position, Dr McIntosh is unable to join CSIRO until January. Acting Chief Dr Green has been appointed as the Chief Executive until then to ensure that the key strategic issues identified by the Evaluation Committee continue to be addressed.

Dr Malcolm McIntosh: career has focused on managing the interface between the public and private sectors

Dr McIntosh, 49, has a PhD in physics from the Australian National University and worked as a research scientist at the Weapons Research Laboratory.

After a period of service in the Australian Army, he embarked on a career that has focused on managing the interface between the public and private sectors.

His experience includes a number of senior appointments in Australian economic ministries, Secretary of the Myers Committee of Inquiry into Technological Change in Australia, and Secretary to the Australian Department of Industry, Technology and Commerce.

Announcing the appointment, the Minister for Industry, Science and Technology, Senator Peter Cook, said Dr McIntosh would bring to CSIRO a unique combination of management, commercial and international experience with solid scientific credentials.

"He has been an excellent ambassador for Australia and I believe his contribution to the Australian scientific community in leading CSIRO will be invaluable for our future," Senator Cook said.

Dr McIntosh said he was looking forward to his new role, and to bringing his family back to Australia.

"It has always been a source of national pride to me to see how highly regarded CSIRO is internationally. I will be determined to see that its reputation for scientific excellence maintained, and its talents applied in the national interest."

Executive Forum to act on evaluation

An Executive Forum meeting on July 26-27 will be finalising action on some of the key findings of the evaluation process.

The forum will consider reports from four task forces covering CSIRO's role, culture, structure and clients.

It will also consider submissions from two subcommittees covering internal communications and research support services.

The task forces have been examining the issues raised in the Board Discussion Paper, as well as the views of staff put forward during staff forums and in some 80 submissions in response to the Discussion Paper.

The staff forums were held in April, when Acting Chief Executive Dr Roy Green visited CSIRO sites in each capital city to talk to staff about the Discussion Paper.

The evaluation process is examining ways to strengthen CSIRO's service to customers, enhance accessibility to its research, increase flexibility and improve talent pooling across the organisation, as well as maintaining CSIRO's traditional research excellence.

One of the Discussion Paper's major recommendations is to abolish the Institutes and to have less rigidly structured Divisions, with multi-Divisional teams coming together for specific projects.

It suggests that the Executive be restructured as a team of Group Executives/Executive General Managers, with more emphasis on their corporate and strategic responsibilities.

The Discussion Paper acknowledges that internal communication is a critical issue, and this has been the subject of a separate report (see story at right).

It also recommends analysing the effectiveness of research support, with the aim of directing more resources to research.

continued page 2

Communication report released

Action is already being taken on the recommendations in the Bright Report, which has given guidelines for improving CSIRO's internal communication.

The report, prepared by Stephen Bright of Catalyst Communication Consultants, stresses that the current debates and uncertainty within CSIRO are typical of hundreds of Australian organisations of all sizes that are struggling to increase accountability, effectiveness and performance.

But it points out that CSIRO is well placed to cope because it has highly intelligent, skilled and dedicated personnel, the support of the Australian society and a reputation as a world-class force in the development of technology and ideas.

The report was based on extensive surveys of staff at all levels and across all areas.

The findings will be fed into the evaluation process and the recommendations have already been considered by the Board and Executive Committee.

Many of the recommendations have been acted on immediately.

Chief Executive Dr Roy Green says internal communication is a major concern to both staff and management and the report gives a real opportunity for positive action to improve the situation.

"I think it's been a long-running problem," he says. "CSIRO's spectrum of activity and its geographic spread make it an extremely complex organisation to handle in terms of communication — in both the technology as well as the practice.

"There's no one answer; there's a set of answers. One is the technology: we don't talk very well to each other with e-mail, because the packages we have are not all communicable across the system.

"But the other is more the way we behave. One of the clear messages is that communication is best done vocally or face to face.

"We are going have to make sure that the geographic distances are handled and that the OICs find the time to do the talking to the staff."

continued page 7

No longer an actor

After several months as Acting Chief, Dr Roy Green has been appointed Chief Executive until Dr Malcolm McIntosh's arrival next year.

Dr Green admits that when he was first asked to step in as Acting Chief, he was a bit reluctant.

"This was my final year as Director of the Institute of National Resources and Environment, and I was particularly looking forward to my last chance to visit all the laboratories and do my annual review of Divisions," he says.

But he has found the new role challenging and rewarding. "I think I have managed to carry forward the ideas and leadership that John Stocker showed, and put a number of things in place ready for the new chief. I certainly haven't just been keeping the seat warm!"

Dr Roy Green

Dr Green says his visits to CSIRO centres around the country to discuss the proposed restructure were extraordinarily useful interactions. "I will be recommending that the new Chief Executive should have these sorts of meetings on a fairly regular basis to get instant feedback on staff concerns," he says.

Next year Dr Green is going to Paris work with the Intergovernmental Oceanographic Commission.

Action on evaluation

from page 1

Dr Green says the Executive Committee and the Board decided about 18 months ago that a re-examination of CSIRO's structure was timely. "It was a matter of determining our own future rather than letting other people do it for us," Dr Green says.

"We are not talking from a position of weakness, because our client base, including Government, see us as having performed extraordinarily well over the years. It's really just emphasising the areas in which we can see room for further improvement."

A key staff criticism of the Discussion Paper was that it didn't give enough emphasis to the need for CSIRO to maintain its scientific excellence. Dr Green says this is being addressed in the deliberations of the Task Forces.

"However, our fundamental driving force is to work to Australia's advantage by trying to make sure that our research is used effectively," he says. "That means looking for outcomes of research, rather than research per se. We can do excellent research that just goes onto the shelves or we can do excellent research that is valued."

But he stresses that this doesn't mean all work must produce commercial results. "A lot that we do is 'for the national good' — environmental studies, for example. This is as important as any other work."

The recommendation to abolish the Institutes and bring together multi-Division research groups to work on particular projects has been contentious.

Dr Green says staff submissions raised questions about whether the new system would work better, about how the funding and management arrangements would be handled, and how to recognise and reward team efforts.

He says there was concern about the "conundrum of reducing research support to put more funds into research, while at the same time trying to make sure that our research leaders have the time to take that leadership role rather than be buried in administration".

Dr Green says that staff submissions showed there is general support for the three principles set out in the paper — flexibility, listening better and getting a more corporate orientation.

Staff will be advised of the results of the Executive Forum via e-mail and in hard copy through line management.

Union puts submission

The CSIRO Division of the CPSU has put a submission to the Board in response to the Discussion Paper.

It says the evaluation process should be an opportunity to increase staff participation in decision-making and to expand the independence of research teams.

It expresses concern at the paper's "top-down" perspective, "which implicitly regards participation in the decision-making process on the part of working scientists and CSIRO employees as a privilege to be conferred at the discretion of senior management.

The union favours the removal of the Institutes and a move to flatter and more flexible management, but says many staff have doubts about the practicability of sectoral clusterings.

It calls for the fostering of teams and networks based on common interest in problems that require a multi-disciplinary approach.

"This will provide a more effective means of reducing 'tribal' barriers than the top-down processes involved in the formation of multi-Divisional projects," it says.

The union also says it is unconvinced by the Paper's assumption that an increased orientation to research clients is possible without impact on CSIRO's disciplinary base or core public-interest functions.

Michelle Smyth, Federal President of the CSIRO Division of the CPSU, says some staff were very disappointed by the Discussion Paper. "They thought there would be more in it to do with their lives, rather than the relationship to government and the structure," she says. "They saw it as more concerned with upper management rather than the staff in general and their worries."

The biggest worry, she says, is funding. "Some staff feel that basic or strategic research even has to be sacrificed to keep up with commercial demands and also that people's jobs are insecure if they don't bring in the dollars at any cost.

"Their second concern is the perception that there's too much management, that careers in science are now secondary to careers in management. It's up to people in higher places to explain the need for good quality management and that it costs money to have it."

She says more participatory management, including staff representation on the Board, would give the Board a better idea of what is going on and make CSIRO work better.

Letters to the Editor

I am writing to congratulate the Siromins on their achievement in competing in the Perth to Rottnest Swimming Race.

From my reading of the article in *CoResearch* it seems that the swimmers and the support team have worked together as a well-oiled swimming machine. I was particularly pleased to read that the shark watchers successfully discharged their duties.

I would appreciate it if you could let me know the secrets of CSIROjuice so that I can pass them on to my colleagues in Government.

It's great to see Western Australians, and particularly staff of CSIRO, once again leading the way in sporting endeavour.

Peter Cook
Minister for Industry, Science and Technology
Parliament House
Canberra

Editor's Note:
Whether the Siromins have let Senator Cook in on the "secrets of CSIROjuice" is itself a secret. However, Siromin John Bell, a CSIRO communicator in the West, was able to reveal that he has been in touch with the Senator: "We've put it in writing that we'd like to include him in the Siromins team in some capacity."

Peter McGuinness, from Senator Cook's office, confirmed that the Senator is a keen yachtsman who, when time permits, loves nothing more than to sail the perilous waters between Fremantle and Rottnest. He says: "The Minister thought the Siromins' achievement was great. He was particularly pleased to see that it occurred in his home state of Western Australia. While it's a bit early to say, I am sure Senator Cook would like to participate in some way next year."

Meanwhile, the Siromins have had inquiries from CSIRO personnel in other parts of the country about joining the team for next year's marathon swim, to be held on February 18. The lure of shark- and jellyfish-infested waters has clearly proved irresistible to CSIRO's adventure lovers.

"It may well be that we field a couple of teams next year," says John Bell. "We may even field a men's team and a women's team, or a mixed team or two. I stress that none of us had done anything like this before."

It just goes to show what some relentless training and the power of CSIROjuice can accomplish. After a merciless interrogation session, John Bell would only divulge the following: "CSIROjuice is Colin White's secret formula. But I can tell you he is a mineral nutritionist so we had carefully prepared meals that we ate between each lap of swimming.

"Colin worked out to the last kilojoule exactly how much energy we had to replace after each swim. He looked at the various drinks that are endorsed by the Institute of Sport and his attitude is that he is one of the international experts in this area so he could provide us with something just as good or better."

Dr Colin White, a member of the swimming team, is one of the inventors of the CSIRO mineral additive *Siromin* after which the team is named.

Go for it, Siromins!

A winner again

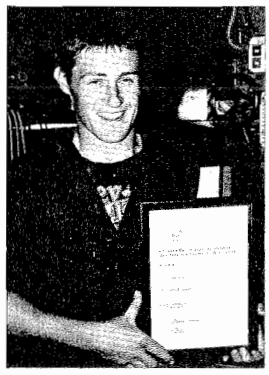
Matthew Barber, machine shop apprentice with the Division of Minerals, won the 1994 third level Apprentice Achievement Award.

CSIRO trains many apprentices in different trades and industry has received some highly trained tradespeople as a result.

CSIRO gives an annual award to the apprentice demonstrating the highest level of achievement in their previous year's training.

The judges consider TAFE college results, examples of work done and supervisors' reports.

This is not the first time judges have been impressed with the standard of Matthew's achievements: he won a similar award as a first-year apprentice.



Diseases explosion gives animal health lab a hectic nine months

The CSIRO Australian Animal Health Laboratory in Geelong has had an extraordinary nine months.

According to Dr Tony Della-Porta, Deputy Head of the Australian Animal Health Laboratory (AAHL), the laboratory has tested for more exotic diseases in the past nine months than the previous five years.

At times staff and resources were stretched, with scientists and technical support staff working round the clock; others worked for weeks without a break.

Over the past nine months the laboratories have not only carried out tests on the high-profile horse virus, but also for kangaroo blindness, ostrich fading syndrome, for two suspected avian disease outbreaks, the pilchards deaths off southern Australia, and an outbreak of Japanese encephalitis in northern Australia.

As well as their exotic disease work, the scientists and technical staff had to deal with their normal testing program, checking imports and some export animals and fish.

During January and February, the labs tested 1000 imported ostriches, which involved more than 10,000 tests to clear the birds from quarantine.

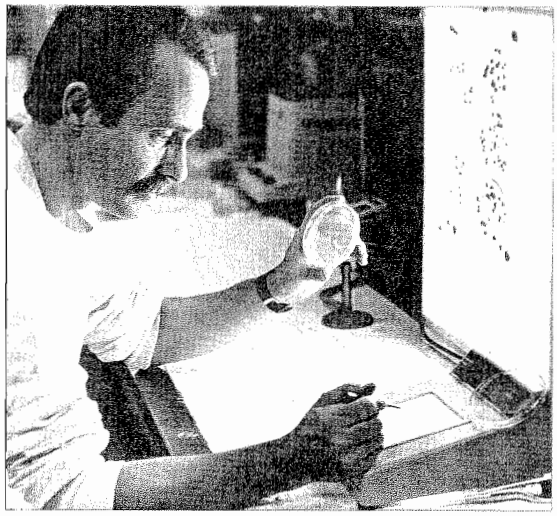
There are also tests associated with normal research, such as the rabbit calicivirus trials under way on Wardang Island off the coast of South Australia.

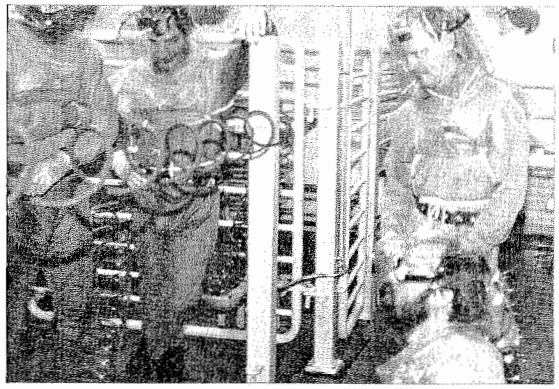
Just over 20,000 tests were carried out during the nine months.

Building and running a world-class facility such as the Australian Animal Health Laboratory is not cheap, but the investment paid for itself many times over in the past few months.

The most dramatic example was the horse virus mystery, equine morbillivirus. It started on the September 22, when Queensland government veterinarians were called to Vic Rail's stables at Hendra to check sick and dying racehorses.

An unknown disease agent infected 14 horses, their trainer, Vic Rail, and a stable hand. The stable hand recovered slowly, but Mr Rail died. The 14 horses also died.





Left: Allan Gould, who started to sequence the virus genes; above: Vets working with infected animals at AAHL wore breathing hoods like these to prevent them coming in contact with the virus

The infection caused hyper-acute respiratory disease, with high fevers and bloody froth coming from the nose of the horses at death.

What amazed many scientists around the world was how fast the identification of the cause of the infection was made.

Frederick Murphy, an expert on emerging viruses at the University of California, Davis, in America's *Science* magazine declared the work of the Australian team as "Excellent. Absolutely superb."

The team included people from the Queensland Department of Primary Industry (QDPI), Queensland Health, Fairfield Infectious Diseases Hospital in Melbourne and CSIRO's AAHL at Geelong.

On Friday, September 23, AAHL received samples from the horses' lungs, spleen and blood. Samples were also sent to Fairfield and to the Centers for Disease Control in Atlanta, Georgia

By 4pm that afternoon an AAHL team, led by Paul Selleck, had excluded the major exotic viral diseases of horses, such as African horse sickness and influenza.

Over the following weekend, major bacterial diseases, such as anthrax, and poisons, such as paraquat, and plant toxins were ruled out by QDPI investigations.

On Monday, September 26, the AAHL's diagnostic team had its first break. Tissue cultures, inoculated three days earlier, were showing signs of virus growth.

A team led by Alex Hyatt identified the virus using electron microscopy. The virus exhibited some characteristics of the *Paramyoxviridae* family. What was puzzling was that none of the viruses in this family was known to cause serious disease in both horses and people.

QDPI also managed to isolate a virus in two more horses, which were the same as those found in the tissue culture at the Lab in Geelong.

Under strict security at AAHL, two trials on horses made them sick within 10 days. Their lungs contained the same virus. Queensland Health also isolated the same virus from kidney samples from Mr Rail.

Allan Gould from AAHL started to sequence the virus genes and soon it was clear that the mystery virus belonged to the Morbilliviruses.

This virus, now called equine morbillivirus, is only the second morbillivirus disease reported in people since the 10th century. The other is measles.

From the time the samples arrived at AAHL, it took an amazing 12 days to find the virus and confirm it had caused the death of the horses and Vic Rail.

Tests to detect the virus were then developed at AAHL, with QDPI and Queensland Health collecting more than 2500 horses and 150 human samples. No new cases were detected, indicating the diseases had been contained.

Nobody knows where the virus came from, and the search is continuing.

The lessons from this extraordinary piece of detective work are clear and simple.

Speedy co-operation between state and federal agencies is vital and Australia must have a facility like AAHL ready at all times with the best people and technology ready to spring into action.

Overseas scientists think we do. Alex Hyatt, from AAHL's Microscopist, has just returned from America, were he was frequently told that "we couldn't have done it here with the speed, accuracy and co-operation you Aussies did."

—Christian Peterson

Short shots

Crunch time for genetically enhanced potatoes

Senator Peter Cook, Minister for Industry, Science and Technology, was among the first in Australia to taste genetically enhanced food — potatoes developed by CSIRO Plant Industry.

Senator Cook tested the Kennebec variety for cooking quality and taste with television personality and chef Peter Russell Clarke.

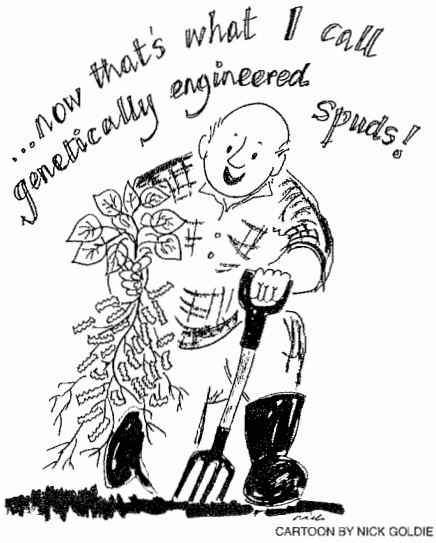
Parliamentarians, scientists, journalists and agri-food industry representatives tasted the potatoes at a specially catered lunch on the Division's lawns at Black Mountain, ACT, in March.

The spuds have been given in-built resistance to the potato virus PLRV, a major disease in potato-growing areas.

"Potato growers spray up to eight times per season to prevent disease-carrying aphids," said Senator Cook. "These genetically modified potatoes should save farmers money, reduce crop losses and also satisfy consumer demands for clean-green food."

Senator Cook said the technology was becoming a commercial reality, with demand for genetically enhanced food in the United States exceeding supply. "I am keen to raise awareness and to encourage informed debate on gene technology," he said.

The genetically enhanced potatoes were tested last December by CSIRO's Sensory Research Centre. This taste evaluation examined aroma, appearance, texture/mouthfeel, flavour/taste, after-taste and overall acceptability. The results were extremely positive, with the expert panel of 35 reporting a very high degree of similarity between the standard and genetically enhanced potatoes.



CARTOON BY NICK GOLDIE

This research is sponsored by the Smith's Snackfood Company Ltd and has been carefully monitored by GMAC.

New Manager of Corporate Business

Dr Tom Biegler has joined that CSIRO Corporate Business Department as Chief General Manager.

He will be assisting the Director Corporate Business, Mr Peter Bradfield, in the management of key aspects of the Department's responsibilities and in providing advice and support on policy development and business initiatives. He will have specific responsibility for Corporate Public Affairs and Strategic Planning and Evaluation.

Dr Biegler was Chief of the Division of Mineral Products until its incorporation into the new Division of Minerals at the beginning of 1995. He brings to Corporate Business a successful track record in CSIRO research management.

Dr Biegler says he has greatly enjoyed his first few weeks at Head Office. "I am really delighted to be able to bring a Divisional perspective directly into the work of a corporate activity," he said.

Food for thought

CSIRO's travelling EatSmart exhibition won second prize for an exhibit in the Technology Pavilion at the Sydney Easter Show. Just on 11,000 visitors tried their hand at the EatSmart CD ROM, which was released at the show. So with all of this information available, it is slightly surprising that one of CSIRO's explainers, an expert on food safety, came down with an alleged case of food poisoning during the show — although some claim it was the latest flu virus. We can keep a secret if you can, Brigitte!

Why is it so?

Christian Peterson's research for his story on the Australian Animal Health Laboratory (see page 3) revealed a couple of surprising facts:

1. Australia imports budgies! AAHL cleared 145 birds from quarantine between September 22 and November 17 last year.

2. New Zealand imports emus from Canada — number unknown!

Minerals merger

The Federal Minister for Resources, David Beddall, officially opened CSIRO's Division of Minerals at Clayton, Victoria, on May 2.

The Minister told the audience of industry guests, Government representatives and CSIRO staff that Australia was a world leader in exploration, mining and mineral processing technology.

"CSIRO has a long association with research and development, and the development of leading-edge technologies for the mining and mineral processing sector," he said. "There have been some outstanding successes providing both economic and environmental benefits."

CSIRO has been responsible for delivering many R&D outcomes to the Australian mineral processing and metal production industries.

These include Sirosmelt lead and copper smelting technology, industrial refractories for lining high-temperature kilns, the synthetic rutile enhancement process, the HIsmelt process for iron and steel production and the Coalscan range of on-line coal quality analysis systems.

Minister Beddall said he was confident that the Division of Minerals will continue CSIRO's effective partnership with industry and help keep Australia at the forefront of technological development in the minerals sector.

The new Division of Minerals has resulted from the merger of the former divisions of Mineral Products and Mineral and Process Engineering.

CSIRO Minerals brings together the skills and knowledge of more than 300 staff in the science and engineering of mineral and metal production and downstream product development.

With facilities in New South Wales, Queensland, Victoria and Western Australia, the Division has a unique position to best serve its industry customers.

"The merger prepares CSIRO to meet the needs of a projected upturn in the metals industry," said Dr Rob La Nauze, Chief of the Division of Minerals.

"We will consult with the industry and government to establish the strategic directions that will further enhance our international competitiveness in this vital economic activity for Australia." **—Anna Cousins**

Launching the new Division of Minerals: from left, Rob La Nauze (Chief of the Division), Dr Alan Reid (Director of CSIRO Institute of Minerals, Energy and Construction) and Minister David Beddall

CSIRO and DSTO offer research fellowships

CSIRO and DSTO have introduced a new annual research fellowship scheme to strengthen collaboration between the two organisations.

Each year the fellowships will enable two CSIRO staff to be seconded to work in a DSTO Division for approximately one year on a topic in which they have a special interest but cannot pursue in the course of their normal work. DSTO scientists will enjoy reciprocal opportunities at CSIRO.

CSIRO term transfer conditions will apply (staff will remain CSIRO employees with on-going benefits).

Applicants may propose any field of research, but DSTO would most welcome applicants in the following areas: radio science and technology, information technology, ground penetrating radar, peace keeping (for example, detection and countering land mines), counter proliferation of weapons of mass destruction, oceanography and simulation technology.

Applications for the 1996 CSIRO-DSTO Research Fellowships, prepared in consultation with your Division Chief, should be submitted to Dr Colin Adam, Chair, CSIRO-DSTO Research Liaison and Co-ordination Committee, CSIRO Head Office, Parkville, by August 10.

For further information contact Malcolm Robertson, CSIRO Corporate Services, Canberra, phone (06) 276 6222, fax (06)276 6466, e-mail malcolm.robertson@csd.csiro.au.

The role of the CSIRO Board

By CSIRO Board Chairman Dr Adrienne Clarke

During the recent staff consultation meetings at major sites around the country, there was a lot of interest in the role of the Board. I undertook to outline the Board's role and how it operates.

The composition and functions of the CSIRO Board are set out in the Science and Industry Research Act 1949. The Board consists of between eight and 10 members, all external except for the Chief Executive.

The external members are chosen to reflect (not represent) the range of interests served by CSIRO. The Board is the key mechanism for ensuring that CSIRO is accountable to the government (and other community stakeholders) for its performance.

Under the Act, the CSIRO Board has a responsibility to ensure the proper and efficient performance of the Organisation. But, as with company boards, the CSIRO Board's role is not to manage, but to monitor management and to provide very broad strategic leadership and support for senior management. Management is entrusted to the Chief Executive and his/her team. This distinction between the roles of boards and management is fundamental to corporate governance.

The monitoring role of a board requires that it is fully informed about the activities and performance of its organisation. The CSIRO Board generally acquires this information by enquiry (by requesting papers on particular issues) and this is supplemented by a range of discussions and site visits.

The "duty to be informed" requires the Board to have sufficient knowledge to undertake a general, on-going monitoring of the affairs and policies of CSIRO, but does not require a detailed knowledge of day-to-day activities or an intrusion into management. It requires open and honest disclosure of information from management and a relationship of trust between the Board and the Organisation's senior managers.

A board therefore has the task of balancing the need to give management the freedom to develop and "own" strategies and plans for the future of an organisation on the one hand, and on the other hand being in effective control.

When everything is going smoothly, boards generally do little beyond monitoring; when an organisation faces problems, as all do from time to time, the board becomes more involved. A board usually does this by advising senior management and/or by being involved in changes to senior management (usually the Chief Executive).

Generally a board's most important task is to select the Chief Executive; boards are also commonly involved in selecting the next layer of senior management — that is the top team which is responsible for management.

The CSIRO Board differs from company boards in that the Board makes recommendations to the Minister with regard to the appointment of the Chief Executive, but the Minister makes the appointment. The CSIRO Board also differs from company boards in that the remuneration of the Chief Executive is dealt with by the Remuneration Tribunal.

The control a company board has over the hire, fire and remuneration of the Chief Executive is the major point of control it has over an organisation; for CSIRO, as with some statutory authorities, this control is somewhat modified.

Like most boards, the CSIRO Board has several formal meetings throughout the year with a program designed to address the broad issues that management brings to it for consideration. In the past, the Board has met around six times each year. When particular issues arise, special meetings are called.

Our Board operates by the Chairman and Chief Executive working out the meeting

agendas together. Management then prepares papers for the Board's consideration and approval. The Board may approve a plan presented or may request further information and/or make suggestions, but it does not develop alternative plans.

An example would be the recent plan to consolidate activities and sites in IAPP. The Chief Executive initiated the plan and presented a paper setting out the details of the proposal, the costs and the problems. There was a discussion in which the principle was approved and requests for further information made. A revised paper was presented at a subsequent meeting for final approval.

Another example would be the Organisation's recent capital expenditure program; the proposed program was presented and there were requests from the Board for further information on the Organisation's property strategy and on individual proposals (in relation to matters such as the cost effectiveness of the proposed expenditure).

The CSIRO Board, like other boards, has an Audit Committee, which meets about four times each year. This Committee assists the Board with its responsibilities relating to the accounting and financial reporting practices of the Organisation. It monitors the identification and assessment of the risks and the implementation and maintenance of policies and control procedures.

The Audit Committee reviews, with management and CSIRO's auditors (ANAO), CSIRO's annual financial statements.

Internal communication

In the course of the work of the Evaluation Committee, it became clear that there were some internal communication issues that needed to be addressed. The Acting Chief Executive subsequently commissioned an examination of this area.

One of the communication shortfalls identified was between senior management and the Board. During Dr John Stocker's term as Chief Executive, the conduit for this information was the Chief Executive, although, on occasions, he invited one of his senior team to present material to the Board and to participate in discussion.

Dr Roy Green, our Acting Chief Executive, and the Board have recently tried a new format in which the whole senior management team (the Executive Committee) is present for a large part of the Board meetings (there will usually be a need also for a short private session dealing with matters such as the appointment of the Chief Executive).

The first two such meetings have been successful and will continue to refine the operating arrangements. The objective is to improve the communication between the Board and senior management by direct contact.

To complement this, we have commenced production of regular bulletins from Board and Chief Executive meetings. We anticipate that this initiative will lead to more informed dialogue on CSIRO's future direction and also enable staff to keep abreast of what issues are currently under consideration by the Board and Executive Committee.

The first bulletin, reporting on the June Board meeting, was released by Dr John Radcliffe (who did an excellent job as Acting Chief Executive during Dr Green's absence overseas). I understand that the response to Dr Radcliffe's summary of the meeting has been extremely positive.

The end of an era in the Top End

Two decades of ecological research drew to a close on May 31, when CSIRO ceased managing Kapalga Research Station in the Northern Territory's Kakadu National Park.

Kapalga has been at the forefront of research for conservation management in tropical Australia since the Division of Wildlife & Ecology established the site in 1976.

Studies have focused on the wildlife of Kakadu's famous wetlands, including the impact of the feral Asian Water Buffalo, and recently on fire, the Top End's most contentious land management issue. Scientists from several CSIRO Divisions, land management agencies, and universities from Australia and overseas have worked on Kapalga, with more than 190 scientific publications resulting from 130 research projects.

Kakadu's famous wetlands were a focus of the Kapalga Open Day. Wildlife & Ecology's Garry Cook (left) explains to Acting Chief Executive Dr Roy Green the importance of native wild rice to waterbirds such as the Magpie Goose.

To commemorate these achievements the Division of Wildlife & Ecology held a public open day at Kapalga on April 5. The event was launched by Federal Minister for Primary Industry and Energy, Senator Bob Collins, who is a former CSIRO research officer, and one of the first to work on Kapalga in the 1970s. Acting Chief Executive Dr Roy Green and Wildlife & Ecology Chief Dr Brian Walker also attended.

CSIRO relinquished its management role at Kapalga to expand its studies across northern Australia as part of a new Co-operative Research Centre for the Sustainable Development of Tropical Savannas. The CRC, based in Darwin, draws together 12 organisations, including the CSIRO Divisions of Wildlife & Ecology, and Tropical Crops & Pastures, from the NT, Western Australia and Queensland. It is funded for seven years with $16 million from the Federal Government, and will focus on land management issues such as pastoralism, tourism, traditional Aboriginal land-use, conservation and mining.

Kapalga's future will be decided by the Australian Nature Conservation Agency, the manager of Kakadu National Park. The Officer-in-Charge of Kapalga, Dr Dick Braithwaite, says CSIRO would like to see Kapalga continue operating as a research station. "We hope that the future managers of Kapalga build on the great research tradition we have established," he says.

—Barbara McKaige

Two Divisions get new Chiefs

APPLIED PHYSICS

With a record of over 10 years industrial research experience with AT&T Bell Laboratories to draw on, the new Chief of CSIRO's Division of Applied Physics, Dr Abbas Ourmazd, is expected to bring a wealth of knowledge to the job.

Dr Ourmazd intends to carry on the work of the former Chief, Dr Bill Blevin, and the current Divisional Management Committee led by Dr John Collins in "delivering research value to Australian industry".

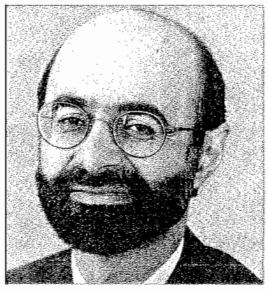
"The Division of Applied Physics has a strong management team that is in tune with the needs and potential of Australian industry," Dr Ourmazd says. "I hope to be able to contribute from a different perspective, based on my experience of industrial research and best practice in corporate America.

"Many industrial and scientific global trends are established in the United States, but that doesn't mean that solutions formulated for problems there can be automatically transplanted to the Australian scene. I have a realistic view about how long it takes to develop solutions appropriate to the local culture."

Dr Ourmazd believes Australian science can play a valuable role in Australia's interactions with its neighbours.

The National Measurement Laboratory has already built an important network in Asia in the standards field, under the direction of Dr Barry Inglis. Dr Ourmazd believes this is a significant asset in Australia's geopolitical dealings.

Dr Ourmazd studied physics at Oxford, gaining his doctorate and becoming a fellow of Merton College in 1979, before taking up an Alexander von Humboldt Fellowship at Göttingen University in Germany in 1982.



Dr Abbas Ourmazd

He joined AT&T Bell Laboratories in New Jersey in 1984, where he has been a Head of Department since 1987. Most recently he has been responsible for 'R&D and technology transfer in silicon electronics, power-efficient technologies and design for manufacturability'. He is still active in research, recently in manipulating the atomic structure of materials for specific needs.

Dr Ourmazd expects to continue some level of research activity. "For me it's been important to remain involved in research even when I have taken on management responsibilities," he says. "For one thing it keeps fresh in my mind the difficulty of doing good research. For another it gives me a collegial channel for interaction with those around me."

Dr Ourmazd is familiar with Australian culture through his wife, Ann, who is from Adelaide. The couple met at Oxford where she was a PhD student. "I am pleased to be bringing her home," he says.

—Christine Williams

TROPICAL CROPS AND PASTURE

Dr John Taylor was appointed Chief of the CSIRO Division of Tropical Crops and Pasture on July 1.

Announcing the appointment, CSIRO Acting Chief Executive Dr John Radcliffe said Dr Taylor was a leader of exceptional quality.

"He is internationally recognised for his personal research on the development of sustainable management practices in extensive grazing lands in northern Australia, Dr Radcliffe said.

"He is also an experienced research manager, and presently leads a team of 45 staff in the Division's Land Management and Agricultural Systems program."

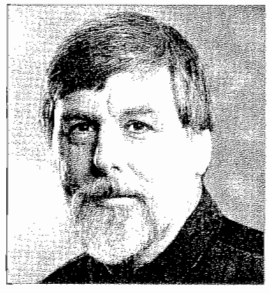
In accepting the appointment, Dr Taylor emphasised his personal commitment to meeting the needs of industry and the community in northern Australia through excellence in research on the sustainable development of the livestock and cropping industries.

Dr Taylor has tertiary qualifications from the Universities of Queensland and New England.

From 1980 to 1984 he was with CSIRO in Darwin, where he developed new methods for studying the impact of buffalo and wildlife on the vegetation and fauna of tropical wetlands and savannas.

In 1985, he was transferred to south-east Queensland to lead a research project on sustainable land management practices in subtropical woodlands.

He built a multi-disciplinary team to study practical issues confronting graziers, particularly at the large scale of commercial paddocks and properties.



Dr John Taylor

In 1989, Dr Taylor was awarded a Churchill Fellowship to study the sustainable management of extensive grazing lands in the United States.

Dr Taylor replaces Dr Bob Clements, who became Director of the Australian Centre for International Agricultural Research on July 1.

Inspection on the Merbein site, probably in June 1919

Doug Shears opens the new Conference Centre and Laboratory

Horticulture marks 75 years at Merbein

The Division of Horticulture's new $2.7 million Conference Centre and Laboratory extension at Merbein in Victoria was officially opened on April 28 by Doug Shears, a member of the CSIRO Board.

The official opening coincided with celebrations to commemorate 75 years of research at the Merbein site.

About 140 guests, including a large number of former staff, attended the official opening. It was followed by two open days that attracted almost 2000 people.

The Merbein station has a rich history. At its inception it was principally financed by a per-ton levy on dried grape production, and by a grant from the Commonwealth Advisory Council of Science and Industry, later called the Commonwealth Institute of Science and Industry, which preceded CSIR and CSIRO.

The first research at the site, under the direction of Mr A. V. Lyon, focused on the fungal disease of grapevines called black spot. This successful research led to improved methods for control of black spot and other fungal diseases, and in turn led to other work such as fertiliser trials, development of dipping mixtures for quicker drying of grapes and fumigation techniques for dried grapes in storage.

This was the beginning of steady expansion of the Merbein Research Station.

As Merbein expanded, so did the Division. From humble beginnings at Merbein, it has established laboratories in Adelaide, Darwin and Brisbane.

In 1988 it incorporated the Sydney post-harvest horticulture laboratories from the former CSIRO Division of Food Research.

Close cooperation with industry and with State horticultural research centres in Sunraysia-Riverland has been a feature of the Merbein Research Station over the years. A new era of even closer cooperation was established in 1991 between the four centres of Merbein (CSIRO), Irymple (Agriculture Victoria), Dareton (New South Wales Agriculture) and Loxton (Primary Industries, South Australia, and the South Australian Research and Development Institute). The cooperative arrangement, called Riverlink, is a historic initiative in the management of Australian horticultural research and development.

Former Chairman of the Division of Horticulture's Advisory Committee and past Chairman of the Australian Dried Fruits Association, Henry Tankard, was a speaker at the official opening. He praised the achievements of scientists at Merbein over the years.

"The benefits have extended across the nation and earned international reputations for the dedicated scientists who have applied their talents to our core industries," he said.

Mr Tankard said that the raising of the first shilling on each dried tonne to fund research was the catalyst for all that has been achieved. The transition from solving the immediate threats to the development of superior plants, and revolutionary management practices, and production techniques has been spectacular.

Mr Tankard said the ability to control pest and diseases, and to better manage irrigation and salinity, were fundamental in providing greater security of production in the early years.

Communication review recommends changes

from page 1

Dr Green says that naturally the report found both strengths and weaknesses. He was heartened by its finding that: "CSIRO has what organisations across the world are spending huge development resources to attain — highly-effective, highly-motivated work teams which are flexible, innovative and adaptive to their environment. They communicate well amongst their members and people clearly say that they have the information they need to fulfil their tasks effectively."

The report found that teamwork was highly effective and that informal networks of communication work very effectively at a number of levels. It said CSIRO had a highly committed workforce with a lot of great ideas on how to improve communications.

But the research uncovered significant frustration and alienation among staff at most levels. It says: "Generally, people feel powerless ... they observe significant gaps at the senior management level between what is said, and what is done."

Under stress

A problem is that CSIRO, like many other organisations, is under stress: many managers and staff have such heavy workloads that it is difficult for them to hear what each other is saying.

One theme to emerge was the perception that managers were focusing inwards, searching for blame and micro-managing to the point where two-way communication was virtually impossible, instead of looking outward, managing the organisational boundaries and supporting staff.

The study found that listening and feedback skills at all levels of CSIRO are not highly developed and that there is an absence of shared purpose between different levels. Constraints are largely assumed to be intractable, creating barriers to communication by encouraging the development of 'fiefdom' thinking at the Institute and Divisional levels.

Organisational purpose, objectives and aims are not widely understood or accepted, the reports says. Therefore, communication is often inhibited by a conflict in values and aspirations between teams and the organisation, or between the Division and the rest of the organisation.

The reporting process is singled out as unduly complex, as are the formal processes that govern information flow. The report says the performance evaluation system inhibits communication and creates a culture of divisiveness and self-interest.

Lack of direction, poor communication of purpose and unwillingness to engage in open discussion are cited as inhibiting CSIRO's ability to meet the needs of its customers.

Among the report's recommendations are a series of search conferences to define the CSIRO of the future, a clarification of reporting and communication responsibilities between those two levels, and the development of communication and support processes for program and project managers as the key interface between management and staff.

It also recommends a review of reporting, and a variety of improvements to facilitate better communication, from enhancing the MDP co-ordinator role to developing specialist support to management in dealing with internal communication issues.

Divisional efforts could be supported by CSIRO-oriented publication packages and Divisional Chiefs should develop a meeting schedule to ensure their visibility and accessibility at all the sites under their responsibility. Development of e-mail as a preferred communication tool is recommended.

The heat is off for Trebor

CSIRO's Division of Applied Physics certainly has a good track record with staff. Last year Bill Blevin retired after 42 years with the Division. This year, on May 18, Trebor Jones said goodbye after 47 years.

Trebor Jones: goodbye after 47 years

Anyone who has visited the hallowed halls of the laboratory at West Linfield may try to argue that scientists get lost and it takes them 40 years to find their way out of the labyrinth of corridors.

But one scientist shed some light on the subject, saying that, as standards go, CSIRO Applied Physics is *the* place to work in Australia. Trebor Jones certainly made his mark as one of the leaders of high-temperature measurement using radiation.

He started as a technical assistant with the Division of Food Preservation and Transport in Brisbane. While there, he completed a science degree, part-time, at the University of Queensland. Subsequently he transferred to the Division of Physics at the National Standards Laboratory in Sydney.

In a distinguished career, Trebor established himself as a leading expert in radiation pyrometry temperature standards. He constructed the first photo-electric pyrometer, replacing the human eye as the colour-matching detector, and this resulted in a four-fold improvement in the precision of the International Temperature Scale above the gold melting point.

He was the first co-ordinator of the Asia Pacific Metrology Program and has been a driving force in co-operation between the various national standards laboratories in the Western Pacific.

Trebor had a long commitment to laboratory accreditation and served as chairman of the Heat and Temperature Registration Advisory Committee of the National Association of Testing Authorities.

More than 100 of Trebor's friends and colleagues, past and present, gathered for a farewell lunch at NML in Sydney on May 18.

Forty years on

Staff at the Tropical Beef Centre in Rockhampton held a special morning tea on June 20 in honour of Bev Marler's 40 years with CSIRO.

Bev Marler: valued assistant

Bev has been a highly valued assistant to several Officers in Charge and Assistant Chiefs. She is now the personal assistant to the Centre's Director, John Vercoe, and is the secretary for many of its committees and boards.

Bev has worked at four CSIRO sites in Rockhampton, and for the last 15 years at Ibis Avenue.

She started as an administrative assistant with the Division of Animal Health and Production when the Cattle Research Laboratory opened for business in Rockhampton at the Hunter Street laboratory.

Bev's career proves that multi-skilling is not new. In her time she has typed, licked the stamps and cut stencils for the roneo machine in the days before photocopying.

She also accompanied Greig Turner and Phonse Schleger to Belmont where she was a technical assistant for the early, ground-breaking research into temperature regulation in different cattle breeds.

John Vercoe, with whom Bev has worked closely for more than 15 years, says she is an ideal working partner whose her advice and wise counsel have often been invaluable.

Edu-taining: bringing science to life

Edutainment — a combination of education and entertainment — will help bring science to life through the proposed CSIRO Innovation Centre.

The Centre, proposed for Canberra's Black Mountain Site, will offer interactive exhibits illustrating CSIRO research and its applications in the community.

This unique facility will regularly open its doors so the general public can participate in CSIRO's science and see scientists at work. Areas such as the "lab-in-action", displaying scientific techniques and facilities, will give visitors the chance to have hands-on experience of science.

The Innovation Centre will not only raise public awareness about the uses of science and technology in the innovation process, but will also demonstrate CSIRO's commitment to research.

The Centre will also host some special events such as a monthly lecture series, which will provide research information to end-users.

School groups are one of this project's primary targets. Along with the "lab-in-action", the Centre hopes to house the "Green Machine" — a joint project between Canberra CSIROSEC, the CRC for Plant Science (Centre Education Programs) and the ACT Education Department. The Green Machine, currently located at a temporary site, runs a series of activities for junior students and workshops for teacher training.

Apart from the interactive exhibition areas, the Centre will have conference rooms, a sound-proof auditorium, a CSIRO shop, kiosk and SIROCREDIT among its facilities.

Market research has uncovered a strong public demand for a CSIRO-focused science centre in Canberra and that this facility could complement existing local attractions. Research indicates that an entrance fee of $4 for adults and $2 for children is realistic, and predicts 150,000 visitors in the first year, increasing to 250,000.

This project is not only an ideal opportunity for CSIRO to promote its research to the public, but will also be a chance to present Australia as one of the premier innovation and technology centres in the Asia-Pacific region.

The concept of the Centre is supported by CSIRO Public Affairs, CSIRO Corporate Property and Divisions in INRE and IPPP. The Centre Working Group is producing the Centre's business plan, for review by an evaluation review committee established by CSIRO's Executive Committee. Preliminary discussions with government and industry are also being undertaken.

Comments and suggestions on this proposal would be greatly appreciated. Contact: Lina Meleor Nichele (06) 246 5077, fax (06) 246 5299, email lina @pl.csiro.au.

Silk road to success

Susan Banks, the Melbourne textile designer responsible for CSIRO's scarves and ties, has become a leading designer of corporate wear by avoiding the traditional approach to company accessories.

Susan Banks: impeccable results

She creates designs that subtly represent the activities integral to the organisation. "The design's significance is known to the wearer and is identified with the company, without the company logo being obvious," she says.

Susan designs her products to be wearable and lasting fashion accessories and treasured gifts.

This emphasis on quality, aesthetics and practicality is something Susan brings from her background in producing silk scarves for the top-end of the Australian souvenir market, which still makes up most of her work.

Since starting out in 1981, she has developed a method of printing silk by hand that allows her to tackle complex designs and achieve impeccable results.

In recent years Susan has been discovered by the corporate sector and her clients now include BHP, CRA and the Royal Australian Chemical Institute. The latter commission led to her CSIRO involvement.

Working from resource material provided by CSIRO, Susan created a design that captures a wide range of CSIRO concerns, from molecular structures, electron micrographs and cellular images, to wool fibres and a mining rig.

"The design is based on cellular shapes that contain a whole range of these images, from the microscopic up to the telescopic, looking out into the universe," she says. The texture behind the shapes was inspired by a leaf under magnification.

With little background in the sciences, Susan at first regarded the images from an aesthetic perspective, but then found herself fascinated by their meanings and got quite carried away finding out more about them.

She chose two colourways for the scarves and ties: one in blues and greys and one in rich terracottas and reds.

Susan employs only one other person in her business and enjoys taking a hands-on approach to every aspect of the operation.

For more information about CSIRO's range of corporate merchandise, contact CSIRO Information on (03) 9662 7108, Fax: (03) 9662 7140.

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CoResearch
No. 363 September 1995 CSIRO's staff newspaper
CSIRO AUSTRALIA

Dr McIntosh's whirlwind tour

CSIRO's Chief Executive designate, Dr Malcolm McIntosh, returned to Australia for two weeks in August and visited major CSIRO sites around the country.

His busy itinerary aimed to give him an overview of CSIRO's current research activities and to provide the opportunity for him to meet a cross-section of CSIRO staff and stakeholders.

Dr McIntosh met CSIRO Chiefs, Program Managers, members of Industrial Participation Committees and other senior staff in each capital city.

Informal morning and afternoon teas enabled him to meet other staff at some of the sites he visited, but no general staff meetings were included, as this was just an introductory visit.

A more structured visit program, including all Divisions, will be arranged when Dr McIntosh takes up his position in January.

In Canberra, Dr McIntosh met several Government Ministers, including Science Minister Peter Cook.

He also gave radio and newspaper interviews in several states.

Dr McIntosh returned to England on August 29, to complete his final year with the Ministry of Defence as Permanent Undersecretary of State for Defence Procurement.

After five years away from Australia, Dr McIntosh could not yet be specific about his plans for CSIRO, but indicated that he is keen keen to review its administrative and research support. "I have very strong views about spending every dollar we can lay our hands on the science and as little a possible on the administration," he said in an interview on ABC Radio's *Science Show*.

Howard Lee shows Dr McIntosh some equipment associated with an Argon Ion Laser during his visit to the Division of Minerals, Clayton

Charting the way ahead

Following the Executive Forum on July 27–28, a new task force has been established to develop detailed proposals for CSIRO's structure and operational arrangements as it approaches 2000.

The Executive Forum considered reports from four task forces, drawn from Chiefs and Directors, plus extensive staff feedback on the Discussion Paper arising from the Board's evaluation of CSIRO's management and structure.

The new task force is chaired by Bob Frater, Director of the Institute of Information Science and Engineering. Other members are Arthur Blewitt (Director, Corporate Services) plus Divisional Chiefs Oliver Mayo/Mike Rickard (Animal Production/Animal Health), Jim Peacock (Plant Industry), Tom Spurling (Chemicals and Polymers), Ron Sandland (Mathematics and Statistics), Brian Walker (Wildlife and Ecology) and Adrian Williams (Petroleum Resources).

Its terms of reference require the task force's proposals for CSIRO's structure to take account of sector-specific needs, the customer base and the commercialisation process.

The task force is also to develop statements for the proposed roles, responsibilities and titles of the Executive and Chief levels, proposals for resource allocation processes and proposals for ways to ensure the maintenance and development of CSIRO's strategic research base.

The task force's recommendations are due in mid-October.

Sportswool set to fly

Dr Chris Mallett, Director of the Institute of Animal Production and Processing, presents a Sportswool football guernsey in the West Coast Eagles' colours to one of the team's greatest fans, Senator Peter Cook, the Minister for Industry, Science and Technology, during his visit to CSIRO Head Office this month. Sportswool was developed by the CSIRO Division of Wool Technology. Senator Cook's souvenir guernsey is part of a market trial being conducted by a major manufacturer licensed to produce official sporting garments. There are 15 top AFL players already wearing Sportswool and the number is likely to increase greatly by next year.

New Chief for Division of Entomology

Dr Paul Wellings took up his position as the new Chief of the CSIRO Division of Entomology in July.

In accepting the appointment, for a five-year term, Dr Wellings emphasised his personal commitment to maintaining the Division's record of scientific research excellence.

"This Division is developing world-leading technologies to meet the needs of rural industries in reducing dependence on pesticides," he said. "We are looking at better pest management practices, the implementation of biological control for pests and weeds, evaluating novel transgenic viruses and plants and carrying out research into the role of insects in natural and managed ecosystems."

Dr Wellings has tertiary qualifications from the Universities of East Anglia, Durham and London in Britain.

He began his career as a research fellow at the University of East Anglia in 1980. He joined CSIRO Division of Entomology in 1981, where he has carried out research into biological control, host plant resistance and the population dynamics of insects.

Dr Wellings, who became Assistant Chief of the Division last year, replaces Max Whitten, the Chief for the past 14 years.

PAGE 3: Division wins international distinction

PAGE 5: Staff farewell as Max takes wing

Workshop at a critical time

Planning is now well under way for our first workshop with Government departments. The workshop will be a key input to discussions with Government over our next funding for the triennium starting in 1997-98.

A decision on that triennium funding is due in next year's budget, scheduled for May, and I urge all staff to re-double efforts to promote CSIRO's achievements and capabilities to stakeholders and the community during this time.

The workshop was proposed in the Discussion Paper from the first stage of the evaluation process. That paper noted that CSIRO has very good standing with Government departments. The workshop is intended to build on this by providing a formal Government input to CSIRO's planning processes as well as increasing the use of CSIRO's scientific capabilities by Government.

It will draw together senior staff from Government departments and CSIRO. Departments will present their policy objectives and identify where Australian research could assist. CSIRO staff will respond by presenting our capabilities to provide this assistance.

The workshop will also be an important step towards developing a 'whole of Government' view of what the Government wants from CSIRO.

The Government is clearly CSIRO's most important stakeholder. It provides nearly 70 per cent of our funds through direct appropriation as well as contributing funds through competitive granting schemes and contracts.

The Government has expectations of CSIRO in return for this funding. These include scientific excellence of international standing; an effective relationship with the users of our research to ensure that it is applied in the national interest; and an injection of scientific expertise into the formulation of national policy.

In the draft report of its Inquiry into R&D, the Industry Commission canvassed several different options for funding CSIRO. One of these was to have Government departments directly commission CSIRO's research.

We argued that this was taking the concept of the Government as a 'customer' too far: Government departments do not have the scientific capability to define national research needs and the scientific marketplace the Commission envisioned would be artificial. Government is more of a stakeholder than a customer and so the 'marketplace' would not deliver the economic disciplines being sought. It is pleasing to note that the departments generally supported this view.

In its final report, the Commission apparently accepted this argument. It dropped the notion of departments as customers and endorsed the concept of the annual workshop as a step toward improving interaction between Government and CSIRO.

The workshop comes at a critical time for CSIRO. It will set the scene for discussions with Government on our next triennium funding. Those discussions will be a key focus of the Board and Executive Committee's activities in the coming months.

During this time, it is absolutely essential that we raise the awareness of CSIRO's capabilities and achievements among stakeholders and the community at large. We need to make it widely known what our science has achieved and will continue to achieve in the national interest, and reinforce our record of delivery. In this way we can generate support for a strong national investment in CSIRO.

I hope that all staff will help promote CSIRO in the coming months and I encourage you to put ideas forward and to participate in our promotions.

Dr Roy Green
Chief Executive

Letters to the Editor

A conference of industry and research leaders in Sydney in May — organised by the Australian Science and Technology Council in the Prime Minister's Department — concluded that CSIRO should be privatised, partly sold offshore and developed into an international science export corporation.

It was envisaged that CSIRO would be mainly owned by local banks and super funds, as well as by individuals and some overseas shareholders. However, I doubt if banks and others will be interested in investment in CSIRO. If CSIRO has to be sold off, there must be better options.

So far, CSIRO has been funded mainly by the Australian Government, but multi-government ownership is conceivable. For instance, the countries in the Asia-Oceania region could become joint owners of CSIRO together with Australia.

CSIRO could appoint excellent researchers from these countries. Basic operational costs would be shared by the joint owner countries, and funds for individual projects would be raised by subscription.

CSIRO itself and the member countries could propose research projects. Such joint ownership should be beneficial to both Australia and these other countries.

Many Asian countries are exporting high-tech products aided by Western technology and investment, but most of them do not have enough capability to carry out fundamental research.

Some Pacific islands are facing common problems, such as the conservation of rain forests and the development of energy resources and technology, but individual governments are unable to spend sufficient money for such research.

On the other hand, in Australia, CSIRO has become a heavy financial burden for the Government.

These days, research and technology development are exceedingly expensive for a small government. It is impossible for a single government to support various research activities, from fundamental research to the development of manufacturing technologies. This can be done only by international collaboration.

Expansion of R&D to the whole Asia-Oceania region, with the possibility of a firmer funding basis, should stimulate researchers' morale.

However, to be effective, CSIRO would need to be internationally competitive, meeting customers' requirements as well as being cost efficient.

CSIRO researchers should be prepared for free trade of R&D. Nevertheless this should not mean the death-knell of fundamental research, because many Asian governments and companies need long-term strategic research.

Dr M. Shibaoka
Division of Coal and Energy Technology
North Ryde, NSW

Yet all experience is an arch wherethro'
Gleams that untravelled world, whose margin fades
For ever and for ever when I move.

This striking and enigmatic piece of Tennyson is as good a mission statement for CSIRO as any. It is also a good mission statement for a modernist society.

Organisations like CSIRO that explore "that untravelled world" are the cutting edge of any modernist society. CSIRO is a large part of the ethos of Australian modernism.

So long as CSIRO is exploring the untravelled world, and is doing so with reasonable efficiency, it is achieving its objectives. Constant quibbles over CSIRO's budget, or over the way CSIRO is organised, are a disguised attack on modernism itself.

Criticism of CSIRO from anti-modernist elements in society implies that CSIRO is doing its job. The stronger such criticism, the better we are.

Modernism mean exploring the possibilities and ramifications of scientific knowledge. Modernism is innovative and non-traditional. The exploration costs money,

continued page 7

Inaugural Priestley Lecture

To commemorate the 80th birthday of Dr Bill Priestley, founding Chief of the Division of Atmospheric Research, the Division has established the annual Priestley Lecture.

The lecture will be an important annual event in the life of the Division, and in Australian atmospheric science.

The inaugural Priestley Lecturer for 1995 was Professor Akiva Yaglom, an eminent Russian-born scientist based at Massachusetts Institute of Technology. Professor Yaglom is highly respected for his achievements in boundary-layer meteorology.

His theme was turbulence (atmospheric, not political), and he presented a fascinating review of international developments in the field to which both he and Dr Priestley have contributed so much.

Prof Akiva Yaglom with Frances Philip and her portrait of Dr Bill Priestley

Before the address, a number of former staff members reminisced about the early days of the Division. A portrait of Dr Priestley, kindly donated by Frances Philip, wife of Dr John Philip (ex-Chief of the Centre for Environmental Mechanics), was unveiled.

Connie Priestley represented her husband, giving an entertaining talk including a pointed reference to the importance of support staff "keeping the place ticking over. Left to the professional staff, goodness only knows what might happen!"

The event was a resounding success, with our theatre packed with staff and visitors.

While in Australia as a guest of the Division, Professor Yaglom also spoke at scientific institutions in Adelaide, Canberra, and Newcastle.

—Paul Holper

Division of Entomology wins international distinction

The CSIRO Division of Entomology received an Award of Distinction at the 13th International Plant Protection Congress in the Netherlands in June.

The Division's Chief, Dr Paul Wellings, accepted the award, which was made in recognition of the Division's work on biological alternatives to pesticides, specifically its pioneering use of nematodes for crop protection.

Nematodes are tiny roundworms that invade and parasitise the bodies of other organisms. Some are insecticidal, and can be used to control insects in place of chemical pesticides.

The Division has been undertaking extensive research on nematodes for the past 30 years. Several years ago the wood wasp Sirex, a major pest of pine forests, was successfully controlled by the nematode *Deladenus siricidicola*, using CSIRO research.

The Division had another major success in a collaborative nematode research project with China, funded by the Australian Centre for International Agricultural Research. Nematodes have been shown to be a cost-effective means of controlling Carposina niponensis, the major pest of China's one million hectares of apple orchards, and they have already saved over one million shade trees in northern China from the carpenter moth, *Holcocerus insularis*.

The Division has also used nematodes to control the black vine weevil and the banana weevil borer. Researchers are now looking for ways to use nematodes against a wide range of other pests, including the codling moth, a serious problem for apple and pear growers.

The 13th International Plant Protection Congress was held in the Hague and drew 1000 participants from 60 countries. Its other awards this year went to a Swiss company, Ciba Crop Protection, and a Dutch company, Koppert.

Dr Paul Wellings presents the International Plant Protection Congress Award of Distinction to Dr Robin Bedding, the nematode project leader

Grass-roots support

Nick Goldie, CSIRO journalist with Corporate Affairs in Canberra, was asked at very short notice to go to South East Asia in place of Thomas Hargrove, who is being held for ransom somewhere in Colombia. Hargrove, a journalist with the International Centre for Tropical Agriculture (CIAT), was kidnapped by bandits (or revolutionaries) some months ago when working on his last assignment.

CIAT works with ACIAR and with CSIRO, which is why Nick was asked to go. He was given minimum briefing: look at, report on, and photograph two things — CIAT's Cassava Project and the CIAT-CSIRO Forages for Smallholders Project. Nick's itinerary included Hanoi, Ho Chi Minh City, Hainan in China, Bangkok and Manila, in under three weeks.

You want to know about cassava? I'll tell you about cassava.

It's like a sweet potato, and its product is almost pure starch. It's a staple human food in Africa, mostly used as animal feed in Asia; in places like Ruanda, Zaire, and formerly in Vietnam, it is vital in times of trouble when farmers become soldiers (or refugees). In tropical parts, it's the third most important crop after rice and maize.

Possibly, it's on the verge of breakthrough, leapfrogging from being a subsistence crop to becoming the raw material for sophisticated bio-technology in the production of flavourings and sweeteners.

Farmer (Mrs) Nguyen Thi Luyen among the cassava plants, and eucalypts in the background, in Bac Thai Province, northern Vietnam

Although the itinerary mentioned the big cities, most of the trip was spent in the remote countryside. I was glad that I took a pair of boots. We tramped through the hills in the north of Vietnam, just south of the China border, looking at plantations of cassava and tea, hanging above the tiny rice paddies; and we scrambled over the ridges on southern Leyte in the Philippines, examining stands of stylo and hedgerows of imported grasses.

The CIAT-CSIRO Forages Project, funded by AIDAB (now AusAID) has a particular interest for Australians. While most of the imported grasses and legumes come from Africa or South America, much of the research and development of these forages has been done by CSIRO's Division of Tropical Crops and Pastures. Many of the tree seeds (Vietnam is full of gum trees and acacias and casuarinas) come from the Australian Tree Seed Centre, part of the Division of Forestry in Canberra.

The Forages Project is trying to meet two related problems of marginal areas: declining farm fertility, and increasing demand caused by growing population. Better use of forages will enable farmers to grow more meat and even dairy products.

I was travelling with Guy Henry, a CIAT agricultural economist, and local researchers in each area. Very noticeably, both the Cassava and the Forages Projects were 'helping the farmers to help themselves', allowing the farmers to do their own research. Everywhere, our pattern was the same; walking through the (tiny) fields, and then tea. Green tea. Litres of green tea. Buckets of green tea.

And discussion. Are the new varieties satisfactory? Do they need much fertilizer? Do the animals eat them? Are your neighbours interested in taking part in the project? And so on.

This was research aid at the most grass-roots level, and — it seemed to me — it was much appreciated. The farmers made us welcome, they were happy to discuss and argue (and predict that *we'll all be rooned, said Hanrahan*, if things don't improve), and they recognised that along with the increasing pressures there is a rising standard of living. And for this, for the work of CIAT, AusAID and CSIRO, they are grateful.

Strong demand for presentation skills courses

Would you like to take two days away from your desk and invest it in learning how to present at your best?

That's what many CSIRO scientists seem to be doing, judging by widespread demand for the Presentation Skills Courses given by CSIRO communicators Jenni Metcalfe and Toss Gascoigne.

A course in Canberra earlier this year attracted so many participants from the Division of Water Resources that another had to be organised to handle the overflow.

And the participants' comments suggest that the skills learnt are well worth the time invested. A typical approach seems to be: if you've got to work with limited resources you've got to learn to make the most of yourself.

The 11 scientists from Water Resources took the course to heart and felt much more comfortable about their abilities afterwards.

"During my 29 years with the organisation I have attended various courses, and this one was the most professionally run," says David Short, scientist from the Division of Water Resources. "It was well worth the time and money.

"Not just the smoothness of the presentation, but also the knowledge of the presenters and the way they managed to get it across, was first rate.

"I learned in a variety of ways, listening to brief lectures, picking up tips from accomplished practitioners, and being part of open discussions and small group brainstorming.

"Most importantly, we came to grips with giving prepared and impromptu speeches, even though most of us fear public speaking more than death itself."

It was helpful for David to learn that butterflies are normal — even accomplished speakers suffer nerves in front of a crowd. It is really a matter of how you deal with them.

He particularly appreciated that assessment and feedback was non-threatening. After each speech, the first question was always 'What was done well in that presentation?'. This set the scene for learning in a positive framework.

Dates for CSIRO Presentation Skills Courses for the remainder of the year are: Adelaide, Oct. 19–20; Sydney, Oct. 23–24; Melbourne, Nov. 20–21; Hobart, Nov. 23–24.

A CSIRO Media Skills course will also be held in Adelaide, on Oct. 16–17.

For further information contact your Divisional Communication Manager.

Short shots

Calling all CSIRO cyclists

A cycling team from the Division of Materials, Science and Technology in Melbourne has again entered the annual "Around the Bay in a Day" ride to compete for the Corporate Cup on Sunday, October 15.

Last year's team of 28 riders came fourth and this year, with 40 cyclists enlisted already, they are aiming for even greater success. They are inviting cyclists from all Divisions to join them in flying the flag for CSIRO.

The ride leaves Melbourne and circuits Port Phillip Bay, with a ferry ride across the Heads. Bicycle Victoria has ample back-up facilities such as water stops, break-down vehicles, traffic control people, food and entertainment, plus a sag wagon to return you to the start if you cannot complete the full distance.

This is not intended as a race but rather a personal challenge. All types of bikes and riders are entered, from the young (16 years) to the very old ("like some of us!" say the DMST riders).

So, dust off your old bike, pump up the tyres, and for more information contact: Peter Curtis, (03) 9542 2700 email curtis@mst.csiro.au, or Bob Brett, (03) 9542 2970 email brett@mst.csiro.au.

Staff at DMST dusting off their bikes in preparation for the annual Around the Bay in a Day ride

Opportunities in Japan

The Division of Building, Construction and Engineering is developing opportunities for its industry to maximise the potential of falling trade barriers in Japan.

In May, DBCE's Dr Lam Pham and Dr Bob Leicester joined representatives of Austrade and the Department of Housing and Regional Development on a trade mission to Japan, intending to build relationships and investigate possibilities for cooperation.

Dr Pham said: "We found that the Japanese are very serious about deregulation and are looking for ways for Australia and Japan to achieve mutual recognition of each other's standards.

"The Ministry of Construction in Japan has indicated that it is happy to work with CSIRO to find a way around any technical barriers that Australian exporters may encounter."

A Memorandum of Understanding between DHARD and the Ministry of Construction includes commencing procedures for the recognition of CSIRO as a foreign testing organisation.

This could bring great opportunities for Australia's construction and materials industries because Japan builds around 1.6 million housing units each year, and could import at least 50 per cent of the materials used.

New book on cyclic designs

Cyclic and Computer Generated Designs is a book that will be of use to graduate students of statistics and to all those statisticians engaged in the design and analysis of experiments in almost any area of application.

It is concerned with the statistical design and analysis of experiments, and provides useful and up-to-date coverage of incomplete blocks, row-column designs and factorial experiments and their analyses.

The book, by Nye John of the Centre for Applied Physics at the University of Waikato in New Zealand, and CSIRO's Emlyn Williams, from the Division of Forestry in Canberra, is a much expanded and updated edition of the well received monograph on *Cyclic Designs*.

Cyclic and Computer Generated Designs, published by Chapman and Hall, is being distributed by Thomas Nelson in Australia.

University honours

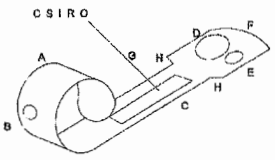
Dr Richard Millington, a former chief of the Division of Land Research (1973–1982) and of the Division of Land and Water Resources (1982–1987), Dr Max Richards, CSIRO Board member since 1991 and Chairman of Abertoyle Limited, and Dr Bill Blevin, former Chief of Applied Physics (1988–1994), were among this year's recipients of the Distinguished Alumni Award from the University of New England.

The honour recognises graduates' outstanding personal contribution to the enrichment of society through innovation and dedication.

The other 1995 recipient was Colonel Professor Dato' Kamarudin Hj Kachar, a distinguished Malaysian educator.

Which widget?

Ramon Cornejo-Rios, CSIRO's librarian in Canberra, is trying to identify this device, following a letter from a puzzled person in Hertfordshire, England. It is, as the letter notes, "a tool or gauge marked with the initials of your organisation". But nothing else is certain. The letter concludes: "Its purpose has long been a mystery, and if you can provide any information at all, I would be most grateful."



We hesitate to turn this into a *CoResearch* competition, but please send us your suggestions. The best, or at least the most imaginative, will be rewarded with the usual prize: copious publicity in the next issue.

Senator Cook opens SME program

The Minister for Industry Science and Technology, Senator Peter Cook, this month announced CSIRO's latest initiative to work with small to medium enterprises (SMEs) to assess technology needs and opportunities — the Industry Liaison Managers Network.

Senator Peter Cook (centre) with Industrial Liaison Managers at the launch of the program this month

CSIRO's Institute of Industrial Technologies has established a network of Industry Liaison Managers who, over the next 12 months, will contact 250 companies, get to know their management and their business, and assess if the business would benefit from CSIRO assistance.

"The Industry Liaison Managers will build on CSIRO's increasing involvement with SMEs," Senator Cook said at the official opening of the program at CEM International Pty Ltd in Melbourne.

"CSIRO's income from SMEs rose by 69 per cent in 1993-94, with the number using CSIRO's testing and accreditation services increasing by 46 per cent. This bodes well for Australia, as technology is one of the factors that can give Australian SMEs an additional competitive edge internationally."

Most of the ILMs have come from outside the organisation, and bring extensive skills in business, technology transfer and consulting skills. A greater understanding of business and industry will help CSIRO provide technology and technical assistance appropriate to the company's strategic direction.

Gregg Reynolds is the ILM with the Division of Chemicals and Polymers. Gregg has worked with companies such as Dunlop and Nylex and ran his own consulting company that specialised in providing advice to SMEs.

Other ILMs also have extensive experience in areas such a product design and general manufacturing systems, metals processing, ceramics, and biotechnology.

The job of an ILM is clearly defined, according to Mike Kenyon, the SME Program Co-ordinator for the Institute of Industrial Technologies.

"We have to bridge the gap between CSIRO and SMEs and significantly increase the level of interaction between technology providers and users," he says. "The SME program must produce measurable results for companies and we have set ourselves some targets for the next 12 months."

The ILMs are to approach 250 companies and Mike Kenyon expects that 50 will become involved with CSIRO. "We want to produce identifiable benefits for those companies of well over $2.5 million," he says.

Where possible, the SME program is to be be integrated with AusIndustry and NIES activities, so that a total technology, business and support service will be available to companies.

The companies approached so far see the SME program as a move in the right direction by CSIRO.

The ILMs are a positive first contact with CSIRO and should ease SMEs' entrée to the Institute of Industrial Technologies.

Over the next three years CSIRO will receive $10 million for the SME program from the federal Government's Working Nation initiative, with $3 million of it going to the Institute of Industrial Technologies.

—Christian Peterson

Crustaceans are a family affair

Fisheries cadet Karina Hirakawa with one of her research subjects

Earlier this year, the Division of Fisheries' Brisbane marine laboratory appointed the first cadet through CSIRO's Aboriginal and Torres Strait Islander Recruitment and Career Development Strategy.

Karina Hirakawa, 21, is now assisting the Tropical Benthic Ecology Project group in the collection of marine environmental and fishery information in the Torres Strait. She has also begun an applied science degree course at QUT.

Born and raised on Thursday Island, Karina is quite at home with crustaceans — her father Kyozo ("Joe"), who migrated from Japan to Australia after World War II, is a self-employed crayfish diver.

The fourth in a family of five children, Karina completed her secondary education in a Townsville boarding school, before returning to Thursday Island and obtaining work as a dental assistant with the Peninsula and Torres Strait Regional Health Authority.

Thanks to a chance encounter with CSIRO marine scientist Geoff Dews, Karina spent six months visiting 14 islands in the Torres Strait to collect catch statistics from local fishermen for CSIRO. She applied for the cadetship after completing this contract.

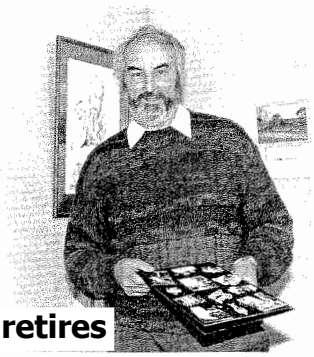
Karina has been assisting with lobster feeding trails since joining the CSIRO marine laboratory in Brisbane, last March, where she is supervised by fisheries ecologist Aubery Harris. She had also undertaken computer work and analysis of underwater video footage of the benthic environment on the Great Barrier Reef.

Aubery Harris says Karina will probably take a diving course and gain a Queensland boating licence before taking part in fieldwork in the Torres Strait region later this year.

"The cadet selection criteria placed importance on knowledge of the Torres Strait community," he says. "Communication is important in a cross-cultural environment."

Karina believes language difficulties are the main barrier to effective communication. "Torres Strait Islanders are very reserved people," she says. "Sometimes they won't talk to you simply because they don't believe their English is good enough."

Karina, who speaks Torres Strait Creole and understands several Islander dialects, is well-placed to deal with such issues. **—Judith Mishinski**



Max Whitten retires

Max Whitten with his blowfly sculpture and other farewell gifts

Staff farewell as Max takes wing

Dr Max Whitten, who had been Chief of Entomology for the past 14 years, was given a staff farewell at a happy hour on August 7.

CSIRO Chief Executive Dr Roy Green, Director of Corporate Services Arthur Blewitt and chiefs from other Canberra Divisions were among the 200 guests at the function.

Assistant Chief Dr Jim Cullen welcomed the guests and introduced the speakers.

Dr Green paid tribute to Max, saying that his standing as a scientist was very high and that we can all be very proud of what the Division has achieved under his leadership.

Incoming Chief Dr Paul Wellings said Max had offered the conditions that enabled research to excel, by allowing space for initiative and creativity, and the opportunity for novel ideas to grow to maturity.

Max was presented with three gifts: an archival photograph of the first engineering work to establish the Division in Canberra, a Pryor cartoon featuring Max, and an Annemieke Mien textile sculpture of blowflies. The latter was commissioned by the Division to celebrate Max's role as a scientist and his major contribution to research on the genetic control of blowfly populations.

Accepting the gifts, Dr Max Whitten thanked his staff and colleagues at CSIRO, whom he commended as being a terrific team. He also pointed out the range of cutting-edge research being conducted by CSIRO Entomology and its significance to the Australian economy.

Making space for Australia

CSIRO scientists are working to take advantage of opportunities in space while keeping their feet firmly on the ground.

CSIRO's Office of Space Science and Applications, COSSA, celebrates its 11th birthday in December.

It was conceived at a time when the Australian Government was analysing the need for a national space program, and initial tasks were designed to merge CSIRO's R&D expertise with the project management and space mission operation needs.

More than 10 years and several major government reports later, the status of a national space program is still under analysis, but CSIRO's own requirements for space-based information have grown.

COSSA's Head, Dr Brian Embleton, says the office is now concentrating on helping to meet CSIRO's scientific research and industry development objectives through the wise use of space technologies such as satellite imaging.

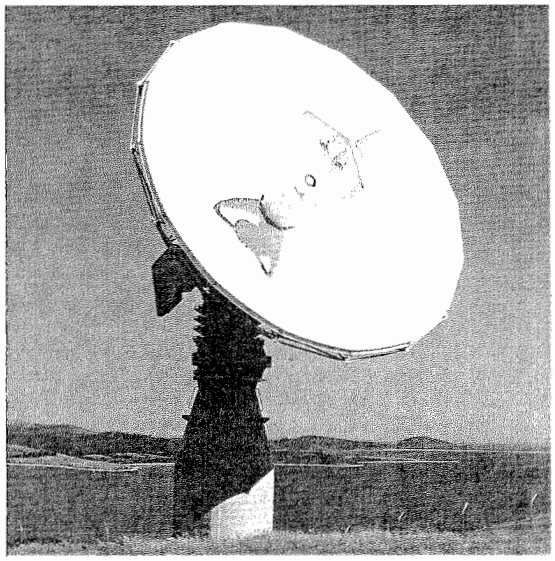
Its work includes co-ordinating CSIRO's Earth Observation research groups and facilities.

Dr Embleton says CSIRO is maintaining a strong effort in international space co-operation, to help fill gaps in global space research programs, while benefiting from the work being carried out by the much larger and older space agencies and research bodies elsewhere.

"CSIRO's international space profile will really take off next year, when we become chair of the main international forum for planning civilian earth observing satellite programs," he says.

COSSA is a small management and technical team of about 10 staff. Its main activities are managing CSIRO access to research aircraft; services in project and program management in space technology and science; and developing strategies for CSIRO's space research, particularly in the field of remote sensing.

CSIRO's astronomical observations are carried out by the Australia Telescope National Facility, with headquarters in Epping, New South Wales. COSSA, based in Canberra, provides site services for two senior ATNF researchers, and works with the ATNF in securing agreements with overseas space agencies, such as the US NASA, Russia's Space Research Institute, and Japan's Institute of Space and Astronautical Sciences.



COSSA's Tasmanian Earth Resources Satellite Station in Hobart: The problems associated with the geographic and generic fragmentation of remote sensing were highlighted in a recent review

COSSA helps the ATNF, and other parts of CSIRO, in seeking support for and providing information to the Australian Space Council, established by the Government in 1994 to advise it on national space activities and plans.

"When it comes to astronomy, CSIRO's total effort is pretty well defined and explicit," Dr Embleton says. "The ATNF manages this effort, and COSSA uses its presence in Canberra, and its international connections, to assist.

He says that in the field of space communication, the CSIRO Division of Radiophysics is the logical focal point within the Organisation. "However, in the area of Earth observation, or remote sensing, around half of CSIRO's 34 research Divisions have devoted some research effort, covering the range from instrument design and engineering, to ground station operation and discipline- or market-based applications."

The problems associated with the geographic and generic fragmentation of remote sensing in CSIRO were highlighted in a recent review, led by Dr James Simpson, an expert in Earth observation and geographic information systems, from the Scripps Institution of Oceanography in San Diego, California.

The review report recommended that CSIRO adopt a new approach, forming teams of remote sensing workers with a combination of essential skills, functions and discipline bases, at several locations.

These units would be known as the "CSIRO Earth Observation Centre", and would be responsible for obtaining remote sensing data; for data product management, including core-level processing; and strategic research to advance the scientific base of remote sensing.

Jeff Kingwell, who has worked at COSSA since 1986, was the secretary for the CSIRO Earth Observation review. "Space missions have a tradition of creating new ways of carrying out complicated scientific and engineering tasks," he says.

"Intolerance of failure, tight deadlines, and high public expectations led to the concept of parallel-tasked, mission-oriented teams consisting of talented and dedicated individuals with the right mix of science, engineering, and management skills. The CSIRO Earth Observation Centre is expected to operate in a similar way.

"In the past, most remote sensing researchers worked in units whose main business was some other field. The Earth Observation Centre will allow researchers to specialise in remote sensing, with the mission of helping CSIRO Divisions, multi-Divisional Programs and external clients to apply remote sensing products and methods to their field of interest."

The CSIRO Earth Observation Centre's first laboratory is being established in Canberra, commencing with the transfer of Dr Dean Graetz, Murray Wilson and Sue Campbell from the Division of Wildlife and Ecology. The Centre's headquarters will be in Canberra, located with COSSA, which will provide administrative and research support.

For further information about COSSA and the CSIRO Earth Observation Centre contact Jeff Kingwell, (06) 216 7200, GPO Box 3023, Canberra, ACT 2601.

Division of Oceanography chief Chris Fandry outlines current marine research initiatives during the recent Australasian Coastal and Engineering Conference in Melbourne. As part of the communication program to achieve greater understanding of the Division's research and technical skills, the trade display attracted broad interest. Exhibits featured remote-sensing images, marine assessment capabilities and technological development designed to assist Government and industry. Of particular interest was the Ausprobe, a retrievable instrument specially developed by CSIRO marine laboratories technical staff in Hobart to record the dispersion of jarosite when it is dumped at sea.

X-ray work a mine of benefits

Keith Norrish is a tenacious person, having worked on x-ray fluorescence for more than 50 years. Along the way he defied conventional scientific wisdom and is still rewriting the text book on x-rays in the mining industry.

When asked why he stuck at it for so long, his answer is not very scientific: "Something in my guts," he says.

Keith Norrish, now in his 70s, is a Post Retirement Fellow at CSIRO Division of Soils in Adelaide. X-rays are his passion.

Back in 1945, while studying for his Masters Degree in West Australia, Keith Norrish built his first machine to measure x- ray fluorescence. "A home-made job," he called it, as none were available off the shelf.

Keith wanted to determine the elements in soil and plants from the fluorescence of particles when X-rays are beamed at them. He soon realised that X-ray fluorescence might be useful to the mining industry.

Unfailing belief

Early in the 1950s, Dr Radoslovich and Keith designed and built an x-ray spectrometer that they used for 10 years in their laboratory work. With an unfailing belief in their ideas, they demonstrated to the mining industry the value of x-ray techniques.

When commercial spectrometers became available, Keith and Dr Radoslovich were in the box seat to help the mining industry use the machine effectively. Transferring research to industry is a bit like real estate. It's about position, and timing.

Today X-ray fluorescence (XRF) is not high on the list of dinner party conversation, but it is spoken of highly in the mining industry.

If you are an exporter of minerals and coal you cannot export any old mineral or coal. You have to export your goods to the specifications negotiated in the sales contract. If you are below the specification, you are penalised, and if you are above you are wasting your money.

Keith pioneered the technique to accurately and quickly analyse more than 80 elements in natural materials during any stage of processing.

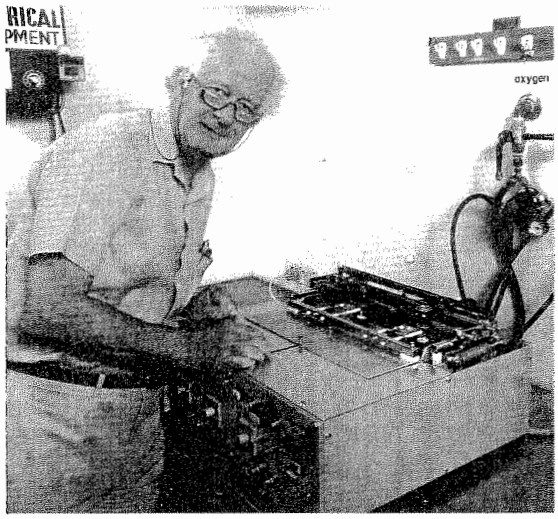
For example, in mineral sands processing, the XRF technique can pick up within 15 minutes changes in composition of the ore, allowing adjustments to be made to the composition before loading on to ore carriers. Before the XRF technique, testing the composition of ore took a couple of days.

Being able to test the ore so quickly produces significant savings in shipping costs, as in the past a ship may have been held up a day or two while tests were completed and the ore composition adjusted. The cost of holding a ship at berth is high and the cost to Australia's export reputation as a supplier of consistent quality goods cannot be calculated.

The XRF technique involves focusing an x-ray beam onto a glass disc that contains dissolved ore or other material. Each disc is made very carefully. The sample is mixed evenly through the molten glass, ensuring that there are no bubbles or other imperfections on the disc surface.

When exposed to x-rays, the material embedded in the disc gives off a signature fluorescence, which reveals which chemical elements are present.

Knowing this allows the level of iron in the shipment to be determined.



Keith Norrish and an x-ray spectrometer: fast testing of ore composition means significant savings in shipping costs

The XRF technique is also used during the exploration stage to determine if an ore body is suitable for mining. Ore bodies that are too rich might be left in the ground because potential buyers can't afford the market price. Mining is like any other business: the right product at the right price at the right time to the right market.

In 1959 the Zinc Corporation at Broken Hill was the first in the mining industry to start using XRF for chemical analysis in its mill. Next Broken Hill Associated Smelters at Port Pirie installed one and Mt Isa Mines was close on its heels. The machines started to pop up in the iron ore, aluminium, copper, tin, coal and cement industries.

By world standards, the Australian mining industry was quick to take up the XRF technique. Today the industry is using more than 100 x-ray spectrometers.

Developing the latest technique is one thing, but having it accepted as the preferred way to test mining exports for contract specifications is another. This is where Keith and his assistant Sally Birch ran into unexpected difficulties.

To have the technique accepted requires a manual to be written and accepted by the Standards Association of Australia or the International Standards Organisation. It also requires experienced technicians in different laboratories to be able to prepare test samples to the same high standard. This did not prove to be an easy task.

Laboratories in Australia, Brazil, Canada, China, Japan, Sweden and the UK participated in validating the technique.

Assessment

This involved a monthly assessment of their methods of analysing iron ore. Each laboratory was given samples of ore from a certified reference material — a sample that had been analysed using the standard chemical methods for determining the chemical composition of materials.

After two years of practice and refinement of the XRF method, all labs were obtaining results that were precise to 0.1% in iron.

But there was something weird going on. Although the labs agreed with one another, their XRF results did not agree with the long-time certificated result. The differences were small, but significant.

Over the next four years the mystery was solved, overturning conventional wisdom in the process.

To solve the discrepancy, Keith re-evaluated their X-ray technique. This took some time.

Next, in collaboration with Japanese and Australian laboratories, Keith and Sally devised an experiment to check the certified reference materials, the results of which have been used for more than 30 years.

Using an improved version of the wet chemical technique, the new analyses agreed with the results obtained by XRF technique. It appears old certified reference material results had been inaccurate in the first place!

Keith and Sally presented these findings at the meeting of the International Standards Organisation (ISO) in Ottawa in September 1994. Based on their results, the ISO has agreed to begin a major test program this year to confirm XRF as the best method for determining the composition of iron ores — and an International Standard method will be published.

Keith and Sally are patient and tenacious people and it is reassuring that truth, justice and the scientific way do win out in the end.

—Christian Peterson

Letters to the Editor

from page 2

and any serious modernist society will accept the cost.

Modernism is part of the goals and objectives of Australia, or so I thought. Perhaps the question is worth a federal referendum.

David Erskine
Water Resources
Griffith, NSW

I would like to add some more light on the recent articles regarding the token Rottnest swim that the Siromins took part in last year.

Unknown to you and probably the Siromins, there has been another team training in earnest for some time and by race time will consider themselves very competitive.

If the Siromins happen to read this and plan on competing this year, they will need more than a jug of that high-tech cordial to kick white water in the face of the *4 from down under* come February 17, 1996.

See you at Cottesloe!

PS: We'll be waiting in the Rottnest Pub!!

Editor's note: This letter — handwritten and unsigned — arrived from the Division of Animal Health at Geelong, Victoria. The phantom force of 4 from down under *is as welcome to* CoResearch *space as the heroic Siromins. We promise the most exciting, comprehensive and unbiased coverage of the athletic achievements of all CSIRO personnel participating in the Perth to Rottnest marathon swim. Clearly, at CSIRO sport is second only to science.*

Still wading after 34 years

The Inaugural Director of the Murray Darling Freshwater Research Centre, David Mitchell, retired from the CSIRO in August.

But he won't be hanging up his waders or shelving his word processor, because he has accepted a position as professorial associate at the Charles Sturt University.

This honorary position gives David the flexibility to pursue his interest in aquatic weeds and wetlands as well as to contribute to the university through research and lecturing.

David's career in research has spanned 34 years, half the globe and a variety of appointments.

As a young scientist in his native Zimbabwe, he studied and named the noxious weed *Salvinia molesta*.

Taking sabbatical leave from the University of Zimbabwe, where he lectured for 16 years, he came to work with Professor Bill Williams at the University of Adelaide.

David Mitchell: retiring but not stopping

This gave him the opportunity to investigate the problem of aquatic weeds throughout Australia and laid the basis for a national management strategy that was later developed by the National Coordinating Committee for Aquatic Weeds.

Subsequently, he joined CSIRO at Griffith where he became Officer in Charge (1982), and then Chief (1988), of the Centre for Irrigation and Freshwater Research. Vying for the Career Juggling Championships, David took up the directorship of the fledgling MDFRC in 1986, while continuing his commitment to the Griffith laboratory for a further two years until it became part of the new Division of Water Resources.

Reflecting on his time at CSIRO, David says: "I've really enjoyed working with people in a range of different capacities and, working for CSIRO has been a real privilege. It gave me the opportunity to explore concepts of research cooperation and interaction as well as many other exciting challenges."

On a lighter note, David is prepared to admit that he has become a fully-ockerised limnologist, having enriched his vocabulary with terms such as billabong and Sydharbs (which of course is the amount of water contained in Sydney Harbour).

Dr Caird Ramsay (pointing) demonstrates a room burn to, from left Larry Little, Dr Max Richards and Dr Alan Reid

Division on show

CSIRO Board member Dr Max Richards recently spent a day at the Division of Building, Construction and Engineering's Highett site, in response to a personal invitation from Division Chief Larry Little.

"We have sent invitations to a number of board members and welcome the opportunity to demonstrate the excellent and industry-valued science carried out in this Division," Larry said.

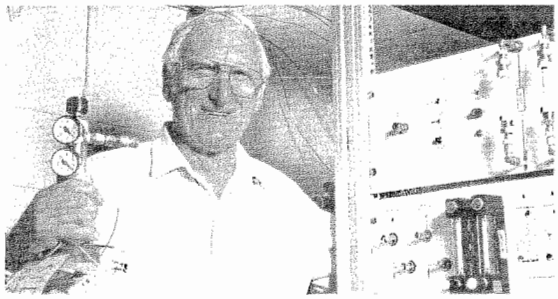
Project leaders showed Dr Richards and Dr Alan Reid some of the research being undertaken. This included the mixing project, which has already demonstrated substantial savings to the mining industry and has application to the construction and food industries; the multi-Divisional project on sewerage investigation technology; the project on improved ventilation technologies, which relates to the CSIRO multi-Divisional project on air quality; and the adhesion technology project, which has attracted widespread interest in the automotive industry.

Dr Richards said: "I was impressed by the range of the projects, the science involved, and the ingenuity of the researchers, and this was an experience I have already recommended to fellow Board members."

New things in the air

Two-thirds of CSIRO's current staff members were yet to be born on the first working day in 1950 when the 16-year-old David Beardsmore nervously entered the army hut that housed the CSIRO Section of Meteorological Physics in Highett, a southern suburb of Melbourne.

Forty-five years later, David has retired from CSIRO, having been an integral part of scientific research into the behaviour and make-up of the atmosphere.



David Beardsmore: helped develop extensive records of the growth of greenhouse gases in the southern hemispheric atmosphere

David began his career with the Micrometeorology Group, making numerous visits to the paddocks of Edithvale and Aspendale for experimental studies of lower atmospheric phenomena. (Aspendale became permanent home to the Division in 1953.)

"Today's safety officers would have kittens if they could see what we used to do unharnessed at the top of the 30-metre-high measurement towers," David admits.

In the mid-50s David joined the agricultural meteorology team, travelling throughout eastern Australia setting up instruments to detect subtle changes in soil moisture. The instruments, known as lysimeters, consisted of massive circular containers set in the ground and filled with soil. At their base was a sensitive balance that registered mass changes during the growing season of the crop planted above.

The success of such projects kept David busy until his move to the atmospheric chemistry group in the early 1970s. By then he had completed a Diploma in Applied Physics at RMIT.

The first regular aircraft sampling of carbon dioxide had just begun and David found himself armed with air sampling gear heading backwards and forwards to Tasmania on Civil Aviation Department F27 training flights.

Thanks to the meticulous work of David and his colleagues, CSIRO now has one of the world's most accurate and extensive records of the growth of greenhouse gases in the southern hemispheric atmosphere.

Hobbies such as lapidary and more prosaic activities such as home maintenance will occupy David's retirement days. He and his wife Loris are also keen to explore some of the more remote parts of Australia.

—Paul Holper, CSIRO Division of Atmospheric Research

Eminent career in nutrition

On April 20 this year Dr Richard (Dick) Smith ended a 47-year career with the CSIRO — one of the longest continuous associations between CSIRO and a member of its professional staff.

In 1948 Dick, a recently graduated biochemist, commenced work with Dr Hedley Marston in the Division of Biochemistry and General Nutrition. In 1993 he retired as a Chief Research Scientist with the Division of Human Nutrition and continued working as a CSIRO Research Fellow until last April.

Dick's contribution to nutrition has been extensive — notably his work on vitamin B12 in ruminants and the role of thyroid hormone in the developing foetal brain. His most recent studies have focused on major risk factors for both hypertension and ischaemic heart disease in Aboriginals living in the Kimberleys.

Dick's eminent career has had many highlights. These include spending 1959 as a Fellow of the McCollum-Pratt Institute in Baltimore, where he had the honour of working with E.V. McCollum, researching the role of vitamin B12 in proportionate metabolism.

Dick Smith and son Anthony

As President of the Australian Nutrition Society in 1985, Dick was responsible for constructing Australia's successful bid to bring the International Union of Nutritional Sciences XV Congress to Adelaide. The event, held in 1993, was attended by delegates from 37 countries. Dick was Secretary General of the Congress.

Dick's association with the CSIRO is continued through his son Anthony, a Senior Research Scientist with the Division of Fisheries in Hobart.

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CoResearch
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CSIRO AUSTRALIA

Virus causes media plague

BY CHRISTIAN PETERSON

Thomas Austin has a lot to answer for.

Mr Austin was a prominent grazier, a Royal host and liked to do things in style. On Christmas Day in 1859, he imported partridges, hares and 24 wild English rabbits, which he released on his property, Barwon Park, near Geelong in Victoria. His reasons were simple: to provide sport for his wealthy mates and a delicacy for their tables.

Twenty years later rabbits were on the rampage in New South Wales according to an article in a Sydney newspaper on December 31, 1879, and pastoralists were predicting ruin in the years ahead if the flood of furry creatures was not stopped.

Today there are more than 200 million rabbits in Australia and they cost farmers an estimated $600 million a year.

The early success of myxomatosis has waned: it killed 90 per cent of the rabbit population in the 1950s but is killing less than 50 per cent today.

The need for an enhanced rabbit control program is obvious and a number of research programs are under way. The Spanish flea to assist the spread of the myxoma virus is one program and an immunocontraception experiment is another. Scientists want to modify the myxoma virus to include genes that will prevent rabbit conception.

The Rabbit Calicivirus Disease (RCD) program, however, is the one that has hit the headlines.

RCD first appeared in China in 1984 and quickly spread to Mexico and now affects rabbits in 40 countries. In Italy it killed 64 million farmed rabbits.

The virus causes up to 95 per cent mortality in adult rabbits.

In 1991 RCD was introduced into quarantine at CSIRO's Australian Animal Health Laboratories in Geelong for extensive testing.

A three-year study at AAHL showed that RCD kills wild rabbits quickly. They die from acute respiratory and heart failure 30 to 40 hours after infection. The virus is transmitted by direct contact and does not need an insect carrier, unlike myxomatosis, which is carried by blood-feeding fleas and mosquitoes. The study at AAHL was the first phase of a three-phase program.

Rabbits continue to damage the rangelands of inland Australia, despite comprehensive control efforts. SOURCE: D LORD, THACKARINGA STATION

During 1995 and 1996, the Australian and New Zealand Rabbit Calicivirus Disease Program was to conduct stage two and three of the program.

Phase Two was the now famous pen trials on Wardang Island in the Spencer Gulf, South Australia. Phase Three was to study free-ranging rabbits in their non-breeding season.

Well, that was the plan.

On October 10 the program issued a media release that there had been a breach of the quarantine area on Wardang Island. To prevent the spread of the virus to the mainland, the island rabbits were being culled extensively.

Most media did not see the news value in the press release, except the *Sydney Morning Herald*.

Next day, under the headline 'Rabbit virus alert as test goes wrong', a media frenzy started. It lasted for nearly three weeks. All major news outlets ran the story, reporting the breach, the spread to the mainland and even that a journalist had inadvertently spread the virus to Yunta in South Australia. Now it appears the virus was spreading by rabbits and unknown carriers at about 40 to 50 kilometres a week.

Over the next month there were hundreds of headlines and radio and TV reports. Headlines announced 'CSIRO joy on rabbit virus', 'Rabbit virus blitz plan', 'Farmers blast greens on virus', 'Virus threatens rabbit sales' and, the best of all, 'Rabbit virus could kill humans says biologist'.

At the outset of the program, a communication team, including key partners in the RCD program, was assembled and a plan developed.

Over the month, 18 press releases were issued, more than 200 key stakeholders were informed, an RCD information booklet was mailed to more than 7000 people, more than 300 information packages were issued to the public, and more than 5000 calls were fielded by the AAHL's team and CSIRO Information Network.

At times, media attention was immense. In the space of half an hour, three news crews arrived at AAHL in two helicopters and one station wagon.

Occasionally there were unfortunate errors in the reporting. For example, ABC TV News and Current Affairs incorrectly announced that CSIRO would vaccinate pet rabbits for free. This launched an avalanche of calls from people wanting to bring their rabbits to AAHL.

A second outbreak of the horse virus added to the pressure for AAHL's communication team.

Throw in the fruit-fly outbreak in mangoes in North Queensland, and birds with a bacterial disease in Victoria, and journalists were desperately trying to link all disease incidents. 'Bugs and viral holocaust near' was etched in the mental pages of more than one journalist.

CSIRO Medals for 1995

The 10th annual CSIRO Medals were presented by CSIRO board member Professor John de Laeter at the State Film Theatre in Melbourne on November 21.

The $25,000 CSIRO Chairman's Medal, the fifth to be awarded, went to Professor Keith Murray, Dr Alex Hyatt, Dr Allan Gould, Dr Peter Hooper, Mr Paul Selleck, Dr Harvey Westbury and Dr Laurie Gleeson from the Division of Animal Health for the discovery of a previously unknown equine morbillivirus.

Winners of this year's CSIRO Medals are:

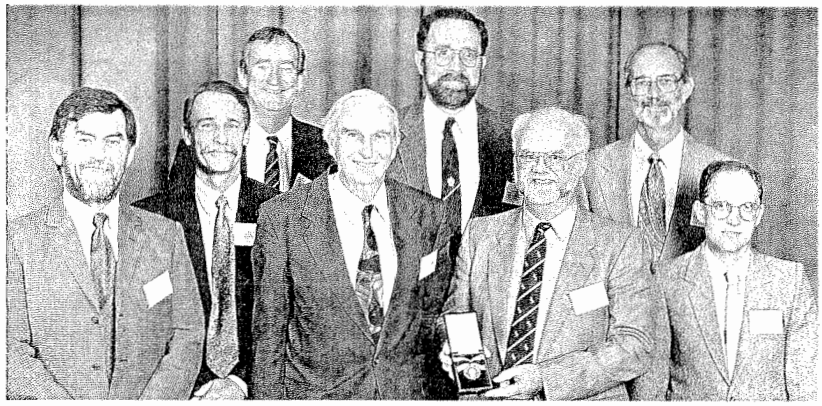
• Dr Barry Harrowfield, Gary Robinson and Ken Atkinson from the Division of Wool Technology for their work in inventing, developing and commercialising the 'Very High Speed Carding' process.

• Dr Nicholas Stokes, Dr Chin-Hsien Li, Dr Xiao-Lin Luo, Dr John Mooney, Dr Zili Zhu and Dr Noel Barton from the Division of Mathematics and Statistics for outstanding research achievement in the development of software called Fastflo.

• Dr Geoffrey Syme of the Division of Water Resources for his contributions to the design of methodologies to measure community risk/benefit trade-offs; defining perceived "fairness" in water allocation; and advancing economic psychological theory.

• Professor Allan W. Snyder and Professor John Mitchell from the Australian National University for the conceptual breakthrough that light itself could guide and manipulate light without intervening structures such as optical fibres — 'Light Guiding Light'.

Full details of all the Medal winners — Pages 6 and 7



Professor John de Laeter (centre) with Chairman's Medal winners: from left, Dr Laurie Gleeson, Dr Allan Gould, Dr Peter Hooper, Dr Alex Hyatt, Professor Keith Murray, Dr Harvey Westbury and Paul Selleck

Ending the year on a high note

It has been a difficult year, with tough issues to address.

John Stocker's departure after five years as Chief Executive put me in the chair — a development that I greeted with mixed feelings, as I was looking forward to my final year as INRE Director.

However, being Chief Executive of CSIRO is a rewarding if demanding experience. The quality of CSIRO's science and pride in leading an organisation so central to Australia's future more than compensate for the burdens of office. Nothing brought this home to me more than this year's Medals ceremony, when we were able to celebrate the exceptional achievements of our colleagues.

The big issue of the year was the evaluation of CSIRO's structure, and I am pleased to say that recommendations for the final structure and an implementation process are going to the Board as I write this column. Let me hasten to add that implementation will be measured and consultative.

The evaluation aimed at improving a structure that has served CSIRO and the nation well. We are working towards an evolutionary rather than revolutionary change.

The key philosophical shift is that Divisions will no longer report through an Institute, but will be members of several sectoral alliances. This will give CSIRO clients much better access to the organisation's total capabilities relevant to their sector.

Also this year, CSIRO has put a lot of effort into developing proposals for the Innovation Statement that the Prime Minister will be issuing in the near future — the expected date is December 6.

Unfortunately, an industry dispute towards the end of the year saw the first stopwork meetings in CSIRO's history. The dispute arose following a communication breakdown, but was quickly resolved by a peak meeting involving myself and the President of the union.

The dispute emphasises the importance of good internal communication, and we are committed to overcoming problems in this area. The Bright Report on internal communication identified many staff concerns, particularly the need for smoother lines of reporting.

I am determined to act quickly on the Bright Report. Some improvements have already been made and others will follow from the work of a task force headed by Dr Graeme Pearman, which will report very shortly.

Overall, I believe that despite the pressures of the year we are ending on a high note. With a new structure nearing completion and a new industrial award in place, I think we can forward to an excellent 1996. The arrival of our new Chief Executive, Dr Malcolm McIntosh, will also give us renewed impetus in pursuing our mission to be a world-class research organisation, vital to Australia's future.

Have a very happy Christmas and enjoy your holidays.

Dr Roy Green
Chief Executive

Equal opportunity award

CSIRO was this year's major winner of the Equality Awards for Innovative Practice in Equal Employment Opportunity (EEO).

It was named Winner of the Open Category for Development and Implementation of EEO Policies and Practices Across all Human Resource Areas.

Of major note was CSIRO's recruitment and career development strategy for Aboriginal and Torres Strait Islanders, which includes the video *Getting Somewhere*; the publication of *What is Fair? What is Not?*, a book summarising anti-discrimination legislation applicable to CSIRO; and the introduction of new flexible working arrangements.

The awards are made by the Public Service Commission and the Institute of Public Administration Australia. They are designed to recognise good practice in EEO by Australian Public Service agencies reporting to and lodging EEO programs with the Public Service Commission.

Accepting the award from Gary Johns, the Minister for Public Service Matters, at Canberra's Hyatt Hotel on October 17, Corporate Human Resources Manager Gary Knobel and Delia Muller of CSIRO's Townsville laboratories represented all of their colleagues involved with the making of *Getting Somewhere*.

CSIRO's Corporate Human Resources Group, winner of this year's Equal Employment Opportunity Award

CSIRO Chief Executive Dr Roy Green congratulated the group, saying: "Our aim in initiating an Aboriginal and Torres Strait Islander employment plan is not just the creation of more jobs in CSIRO. We are increasing access for Aboriginal and Torres Strait Islander people to permanent full-time employment within the organisation and improving our links with the indigenous communities.

"A major component of our EEO strategy is to demonstrate that a career in science can involve many and various opportunities. CSIRO offers research and support positions, in areas as diverse as wildlife, agriculture, mining, manufacturing and computer technology.

"The video *Getting Somewhere* graphically illustrates the excitement of young people working in Australia's science community."

Letters to the Editor

The 'Which widget?' item in the last issue brought a fast solution to the mystery. Kent Barnett of Inplan Ltd in Britain, who posed the question originally, has written to CSIRO thanking those involved. "It is immensely satisfying to have the solution to a nagging question," he says. Here are the responses:

With reference to your "Which widget?" item, the device is used for measuring the effects of acaricides on the cattle tick Bo-ophilus microplus. It was devised by R.H. Wharton, W.J. Roulston and K.B.W. Utech. (Paper Aust. J. agric.Res., 1970, 21, 985-1006.) A photo of the device being used is included in the paper.

The reason it came into being was that a way had to be devised to count the cattle tick accurately for research purposes. A 4.5mm hole is used to measure the tick the day before final engorgement takes place. A second hole of 8mm is the size of the tick at engorgement or when the tick detaches from the host and falls to the ground.

I have the "which widgets" available here at Long Pocket Laboratories, which is used to train staff how to count ticks on cattle when and if necessary. Photos are also available of the tick at the various stages mentioned above and also of the complete life cycle.

Peter Bird
ACTEST Manager
Long Pocket, Qld

The "widget" is obviously a model of the gauge used for counting cattle ticks (Bo-ophilus microplus).The hole "D" would be 8mm diameter, the maximum countable size of a fully engorged tick and hole "E" would be 4mm, the minimum size countable. This range in size is indicative of the number of ticks that would mature and detach in the next 24 hours.

Rex Holmes
CSIRO Tropical Beef Centre
Rockhampton, Qld

It hurts me sore to find that since my retirement from CSIRO my erstwhile colleagues are unable to resolve such a simple problem as that of identifying the "widget" shown in your latest issue. It is, of course, patent that the object is a left-handed, bifurcated, waffle-spracket. However, I do concede that the enantiomorph is the more commonly encountered form.

I refrain from what I feel would be the impertinence of reminding ex-colleagues of the purpose of the device.

Yours in all modesty,

Bob Croll
Olinda, Vic

If we are searching for words for which CSIRO can be an acronym, why not this one that occurred to me some years ago: Can't See Immediate Results Overnight.

Bob Frenkel
Division of Applied Physics

Ozone researcher wins Eureka Prize

Dr Paul Fraser from the Division of Atmospheric Research has won the 1995 POL Eureka Prize for Environmental Research.

Dr Fraser has shown tireless and on-going commitment to research into the ozone layer and its protection.

Apart from researching ozone reduction, he has been actively involved in alerting the public and governments to the potential for effective action.

Dr Fraser was nominated for the Eureka Prize for his project titled "Ozone depleting chemicals in the global atmosphere: solving a major environmental problem by linking fundamental science with government, industry and community responses".

He received his $10,000 prize at a ceremony at the Australian Museum in Sydney last month attended by 200 scientists, researchers and journalists.

This year's winners were announced by science broadcaster Robyn Williams, who conceived the Eurekas five years ago to raise public awareness of outstanding achievements in Australian science.

The Eureka Awards are presented in five categories, and are supported by the ABC, Pol Publishing, the Australian Museum, Reed Books, *New Scientist* magazine and the Department of the Environment, Sport and Territories.

Project boosts ocean safety

A CSIRO project to map ocean currents will be a significant benefit to shipping, search and rescue, fishing and the recreational use of maritime waters.

The project, initiated by CSIRO Oceanography, is being unveiled this month as part of the Oceans-EEZ analysis system.

Declaration of the Exclusive Economic Zone (EEZ) in 1994 gave the Federal Government authority over more than 14 million square kilometres of marine territory. The analysis system describes ocean currents and eddies based on modelling and measurement to provide practical information to business, industry and the community.

EEZ ocean studies by CSIRO Oceanography scientists have resulted in major breakthroughs, including comprehensive descriptions of the Leeuwin Current off Western Australia the East Australian Current, and last year the identification of summer and winter current patterns around the Tasmanian coastline.

The tracking of drift buoys began in 1972, a year before the sinking of an Australian coastal trader, the *Blyth Star*, off Southern Tasmania — a disaster that hauntingly illustrates the need for such research.

For eight days the crew of the vessel drifted in a life raft, travelling 800km around the Tasmanian coast — unsighted from the air yet always within sight of land. Three men died, but had the sinking occurred three weeks later all would have perished because they would have been swept to the Southern Ocean by the summer pattern of converging currents.

Dr George Cresswell, a member of the Oceanography Program team, says: "Because of the studies of drifting buoys since the *Blyth Star* sinking we are much better off in terms of the information we have but we need to do considerably more to be able to present a detailed picture of current patterns in the Tasmanian waters."

The new mapping techniques, especially the development of real-time maps by Drs Peter Craig, Stuart Godfrey, Ken Ridgway and Chris Aiken of the Oceanography Program, promise to be powerful tools in future search and rescue operations, as well as other marine applications in the EEZ.

From 1985 maps were produced by measuring sea surface temperatures from which scientists calculated the patterns and directions of currents and eddies. But in the last year new satellite technology has provided oceanographers with real-time pictures that are in effect weather charts of the ocean currents and eddies.

The latest satellite, the TOPEX/POSEIDON, measures the height of the sea surface. Adding this to information from tracking drift buoys and satellite-read sea surface temperatures, scientists believe they are now able to predict ocean movement in greater detail. This detail shows up unpredictable eddies, which can carry buoys (and boats) hundreds of kilometres.

The satellite, 1340km above the earth, can record sea surface height to within 5cm accuracy.

The first public view of the ocean maps will be in the lead-up to this year's Telstra Mobilenet Sydney-Hobart yacht race, when race skippers and navigators will receive maps based on sea surface temperature and sea surface height as a guide to currents and eddies off the Australian east coast. In the past, Dr Cresswell briefed navigators and provided maps based just on water temperature.

Division of Oceanography scientists involved in ocean mapping: (from left) Drs Peter Craig, George Cresswell and Stuart Godfrey

New enterprise agreement

CSIRO and the CPSU last month agreed on a new enterprise agreement, to run until June 30, 1997.

Ratification by the Industrial Relations Commission will be sought this month.

The agreement came in negotiations between CSIRO, led by Chief Executive Dr Roy Green, and the CPSU, led by Dr Michelle Smyth, following staff stopwork meetings.

The key elements of the agreement are a salary increase for staff of 8.5% in three phases and the establishment of a joint management/union working group to assess CSIRO's remuneration system.

The salary increase will be paid in three parts: 5% from November 1, 1995, 2% from November 1, 1996, and 1.5% from April 1, 1997. The increases will be effective from the first pay period on or after those dates.

The Working Group will recommend ways for CSIRO's remuneration system to better support the organisation in meeting its objectives.

The agreement also includes direct negotiations between CSIRO and the unions on a number of other items, including developing protocols for outsourcing and intellectual property ownership and management.

Dr Green welcomed the agreement. "We have had a long and constructive relationship with the unions and regret the recent industrial action," he said. "However, our ability to reward staff is inextricably linked with our ability to deliver research outcomes of value to industry and the Australian community. This agreement provides a way forward for us all."

Dr Smyth also welcomed the agreement, saying that it provided an immediate benefit to members. She said the union was happy to discuss ways to improve organisational performance: "CSIRO staff believe that CSIRO is vital to Australia's future. It's more than just a job. So we're always willing to explore better ways of doing things."

CSIRO laboratory measures up

The National Measurement Laboratory at CSIRO's Division of Applied Physics in Sydney recently hosted an intercomparison of iodine-stabilised helium neon lasers, which was attended by scientists from Australia, Korea, New Zealand, Singapore, Taiwan and South Africa.

The scientists represented five laboratories within the Asia-Pacific Metrology Program, plus South Africa. The intercomparison aimed to confirm the international acceptability of the primary standards of length maintained at these laboratories.

Dr Jean-Marie Chartier and Mrs Annick Chartier from the Bureau International des Poids et Mesures France co-ordinated the laser intercomparison. BIPM is responsible for overseeing the international system of measuring standards of, for example, length, mass, temperature, time, electricity, photometry and ionising radiation.

Scientists at NML for the laser intercomparison: from left (back row) Glenda Sandars (CSIRO), Annick Chartier (BIPM), Nick Brown (CSIRO), Jean-Marie Chartier (BIPM), Ian Veldman (CSIR, South Africa), Esa Jaatinen (CSIRO), Ren-Huei Hsu (CMS, Taiwan), Eleanor Howick (MSL-IR, New Zealand), (front row) Xu Gan (SISIR, Singapore), Sheng-Hua (Kevin) Lu (CMS, Taiwan), and Hosuhng Suh (KRISS, South Korea)

It selected NML as a location for the direct laser comparisons, based on NML's capabilities and its role in the Asia-Pacific Metrology Program.

Dr and Mrs Chartier brought with them the BIPM travelling iodine stabilised laser used as the definitive standard against which the intercomparisons were made.

The Australian coordinator of the event, Dr Nick Brown, says more than 60 laser intercomparisons were performed, followed by seminars and experimental work. All the lasers tested had frequency offsets less than three times the standard uncertainty of the nominal frequency, and most were within one standard uncertainty.

"This demonstrated that all the lasers were acceptable national standards of length," Dr Brown says.

The National Measurement Laboratory maintains Australia's physical standards of measurement to ensure that Australian measurements are compatible locally and internationally.

Through its involvement in the Asia-Pacific Metrology Program, NML plays a vital role in APEC's push for free trade in our region. NML provides the secretariat for the program, which involves 22 primary measurement laboratories.

Dr Barry Inglis, NML's Chief Standards Scientist, is the Regional Co-ordinator of the Asia Pacific Metrology Program. He says APEC realises that standards throughout the region must be compatible before it can aspire to free trade.

"You have to be sure that if the dimension of an automobile component is measured in Japan and the car is to be assembled in Australia, the standards of measurement are the same," he says.

Dr Inglis says that apart from ensuring that components will fit together and work properly, countries have to be confident that when they trade in commodities they will get the right quantity. Environmental monitoring also depends on agreed measurements.

"The way to do that is to ensure that measurements are traced back to national measurement standards that are being compared on a regular basis."

Short shots

Three awards to CSIRO Publishing

CSIRO Publishing has picked up three of the 1995 Whitely Book Awards presented by the Royal Zoological Society of New South Wales.

Sharks and Rays of Australia, by Peter Last and John Stevens from the Division of Fisheries, won the Whitely Medal as the most outstanding contribution to Australasian zoology this year. The book highlights the vast diversity of shark and ray fauna in our region, with more than 300 species identified so far.

Oecophorine Genera of Australia, by Ian Common from the Division of Entomology, was judged the Best Individual Zoological Monograph for 1995. This volume is the first of three and includes 91 genera containing 500 species of Australian moths.

Zoological Catalogue of Australia, edited by Keith Houston, was judged the Best Zoological Series. It is a series of 90 volumes, covering a specific animal group or groups, and will cite all known species in Australia.

Closer ties with Japanese company

A Letter of Intent to formalise closer ties between CSIRO and the Japanese trading giant Itochu, and to ease access by Australian companies into Asia, was signed on October 24 at Itochu's Tokyo office.

Itochu is a general trading company involved in media, energy and infrastructure. It has operations in 94 countries and annual turnover of $US175 billion.

"We hope this Letter of Intent opens the door to a long and fruitful cooperation between CSIRO and Itochu," said Mr Takeshi Kondo, General Manager of Itochu's Research Division, who signed on behalf of the company.

CSIRO's signatory was Dr Chris Mallett, Director of the Institute of Animal Production and Processing. He described the agreement as a great opportunity for the Australian food companies with which CSIRO works. "Asian markets are often difficult to enter for Australian firms and we expect this CSIRO–Itochu initiative to help those companies develop a Japanese presence," he said. "Itochu will also assist in commercialising CSIRO technologies in Japan and eventually in other countries in Asia where the company has business interests. In return, Itochu and CSIRO will share some of the financial rewards resulting from these commercial ventures. In time, we hope other industry sectors will benefit from this relationship."

(L-R) John Stevens and Peter Last from CSIRO Fisheries receive the prestigious Silver Whitely Medal from Philip Reed, President of the Royal Zoological Society of New South Wales.

Seasoned cyclists in Melbourne ride

CSIRO was well represented in the "Around the Bay in a Day" Corporate Cup bicycle ride in Melbourne on October 15. Its team of 29 riders was drawn predominantly from the Division of Materials, Science and Technology. Individual riders were allowed to nominate the portion of the total 210k distance they wanted to complete. Medallions were awarded to those who reached their goal.

Two of the CSIRO team received their medallions upon finishing their 100k ride and the remaining 27 went on to complete the 210k. The team members' ages ranged from the early 20s to the 50s. Bob Brett, one of the organisers, says: "In fact, the best riders were over 50 because they were seasoned riders."

Second pressing for eatSmart CD

CSIRO has ordered a second pressing of 500 units of its *eatSmart* CD-ROM. The last 250 of the initial pressing of 1000 have been taken by Harvey Norman stores as part of a national promotion of Australian software.

Harvey Norman will be selling CSIRO's three multimedia CDs. It has also ordered 350 copies of *Insects —A World of Diversity* and 500 copies of the ecological adventure *Ecotrekker* as part of the promotion.

More than 2000 copies of *Insects* have been sold since its release last year, and the more recently released *Ecotrekker* has sold nearly 800 copies.

Churchill Fellowship

Applications for 1997 Churchill Fellowships close on February 29, 1996. The Fellowship is open to all Australian residents and is awarded for overseas study projects that will enhance the awardees' usefulness to the Australian community.

Prospective applicants should send a stamped self-addressed 24 x 12 cm envelope to: Application Forms, Winston Churchill Memorial Trust, 218 Northbourne Avenue, Braddon, ACT 2612.

Ian William Wark Medal and Lecture

Nominations for the 1996 Ian William Wark Medal and Lecture close at the end of this month.

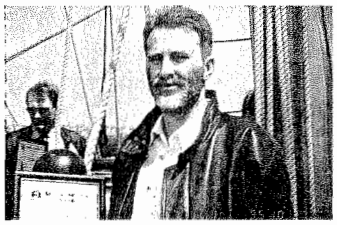
The medal and lecture recognise the significant contribution to Australian science and industry by the late Sir Ian Wark, and encourage those whose work, like Sir Ian's, is at the interface of science and industry.

For information and nomination forms phone Faye Nicholas on (06) 247 5777, fax (06) 257 4620 or write to: The Executive Secretary, Australian Academy of Science, PO Box 783, Canberra, ACT 2601.

Correction

A caption in the last issue of *CoResearch* incorrectly referred to "COSSA's Tasmanian Earth Resources Satellite Station in Hobart". In fact, CSIRO is part of a consortium that owns and operates the facility.

Effluent project wins BHP award



Randall Falkiner aboard 'HMAV Bounty' with the BHP Landcare Award

CSIRO's Wagga Wagga Effluent Plantation Project has received the 1995 BHP State Landcare Research Award for NSW.

The Minister for Land and Water Conservation, Kim Yeadon, presented the award to project representatives Randall Falkiner (Division of Forestry) and Colin Earnshaw (Facilities Engineer, Wagga Wagga City Council) at a ceremony aboard HMAV Bounty on Sydney Harbour on October 27.

The award is made annually to an individual or organisation for outstanding achievements in either land conservation research or the development of innovative landcare technology.

The Wagga Wagga project, which began in 1991, is a six-year study of the potential productivity and limitations to the sustainability of this form of land management. It aims to produce national guidelines based on experimental data and models that will assist local governments, rural industries, environmental regulators and planners in the environmentally sound design and management of effluent-irrigated plantations.

A manual entitled *Effluent-Irrigated Plantations: Design and Management* was launched at a recent national workshop conducted by the project team, which is led by Brian J. Myers.

The team has up to 17 staff from the Divisions of Forestry and Soils, representing disciplines of soil science, hydrology, plant physiology, silviculture and modelling.

As winner of the State Award, the project now becomes a finalist in the National Landcare Awards to be presented by the Prime Minister in March.

Midnight at the Oasis

BY PAUL HOLPER

When the Flinders University research aircraft crash landed in an Adelaide golf course in early October, it took with it a sizeable chunk of experiments planned for OASIS, Australia's largest ever greenhouse gas measurement project.

Luckily no one was seriously injured, but the Cessna's absence caused many sleepless nights for project co-ordinator Mike Raupach and the rest of the planning team. Mike is from the Centre for Environmental Mechanics, the lead group in the two-year, $5 million investigation that began in 1994.

Every self-respecting field experiment needs an acronym. OASIS stands for Observations at Several Interacting Sites. The sites doing the interacting stretched from picturesque Wagga Wagga in southern New South Wales to Urana 100 kilometres to the west. The observations were of gas emissions and energy exchange from typical Australia landscapes.

Chris Drury adjusting eddy correlation equipment at Wagga Wagga during the OASIS project

"The challenge is to obtain agreement between measurements made at small scales, such as a one-square-metre chamber, and larger scales, such as an entire region," says Mike.

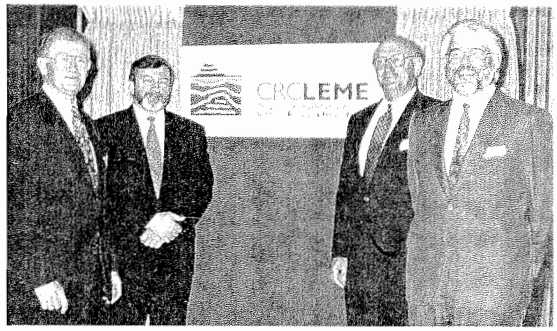
There was never a dull moment for the 40 participating scientists, with gruelling measurement regimes often stretching well into the night. Glass chambers monitored gas transfers, a lysimeter tracked water exchange from a six-tonne block of soil and plants, while instruments on a 20-metre high tower, a four-kilometre high kite and a motorised research glider tracked the state of the atmosphere.

OASIS participants also endured a procession of media visitors and the odd brown snake, the latter causing less anxiety than the former.

Many thought it quite appropriate that during the most intensive phase of the experiment, in October, the streets of Wagga Wagga featured large banners proclaiming Mental Health Week.

OASIS involved researchers from the CSIRO Climate Change Research Program and other CSIRO Divisions; Flinders University; the Australian National University; the University of Wollongong; Charles Sturt University; HortResearch and NIWA from New Zealand; and the University of Colorado.

High-tech launch for mining industry CRC



At the launch of the CRC LEME: From left, Dr Ray Smith, Senator Peter Cook, Dr Ross Fardon and Dr Graham Taylor (CRC executive member, from the University of Canberra)

BY NICK GOLDIE

An interactive electronic link-up between Canberra and Perth was used to launch the Co-operative Research Centre for Land Evolution and Mineral Exploration on August 31.

Scientists and mining industry representatives took part in the launch at Parliament House in Canberra and the Floreat auditorium in Perth.

At the launch, Science Minister Peter Cook said researchers on both sides of the country were collaborating to ensure the success of the new CRC.

The CRC, which will have its headquarters at CSIRO's Floreat Park laboratories in Perth, brings together researchers from the Australian National University, the University of Canberra, the Australian Geological Survey Organisation and CSIRO.

The CRC's Director, Dr Ray Smith of CSIRO, said it is a major research initiative that has strong support from the exploration and mining industry.

"The Centre builds on the strong base of geoscientific R&D across Australia," he said. "CSIRO work in the Yilgarn (WA) contributed to the discovery of the world-class Plutonic and Bronzewing gold deposits.

"CSIRO techniques for geothermal exploration in weathered and lateritic terrains are now used successfully throughout Australia and in similar environments worldwide. They have contributed to finds in Australia whose long-term value could exceed $2 billion."

Dr Smith said the involvement of the Australian National University and the University of Canberra in the CRC will enable their expertise in weathering processes to be integrated into a national picture.

The Federal Government will provide $16 million seed funding over seven years to build research strength, translate results into commercial exploration techniques, and assist in the training of the geoscientists of the future.

At the launch, Dr Ross Fardon of MIM, the Chairman of the CRC Board, presented CRC LEME scholarships to three students in Canberra and one in Perth.

Co-ordinating the political muscle

BY TOSS GASCOIGNE

The Honourable Barry O. Jones claims he was misreported. He never called Australian scientists "wimps".

But he does admit to accusing them of wimpish behaviour, of not providing him with the political muscle to win battles in Cabinet over funding for science.

His comment followed the disastrous science Budget of 1984. Scientists demonstrated at Parliament House but Barry was less than sympathetic.

The science community was pricked into action, and the following year the Federation of Australian Scientific and Technological Societies was established to give the working scientist a voice in Canberra.

FASTS has had its successes since 1985. It lobbied on a series of issues — the 150% tax incentive for R&D, development of the CRC scheme, the Science Minister to be in Cabinet, the National Curriculum Project and ARC post-graduate awards.

Those were all wins. But there are plenty of issues left for incoming President Dr Joe Baker, the Board and their combined persuasive powers.

Dr Baker, who took over from Professor Graham Johnston in November, trained as a chemist, and worked on the essential oils of eucalypts before switching to marine bioactive substances. In science administration he drew attention to the significance of coastal processes and resources, and environmental studies in the marine environment.

He also played rugby league for Queensland and is at present Commissioner for the Environment for the ACT.

Dr Baker has maintained his research activities in bioactive substances and mariculture as Senior Fellow at AIMS in Townsville.

"I think it is very important that the voice of the working scientist be heard," he says. "The Academies, departmental bureaucrats and ministerial staff advise government too, but our opinions come straight from the workbench. It's the only scientific group that can really advise on the latest in techniques, technologies and international thinking."

Joe Baker believes some progress has been made. He sees growing community recognition that S&T is important.

The role of S&T in strengthening Australian industry is another challenge. "Australian investment by industry in R&D remains pathetic, half that of our Asian trading partner and competitor South Korea."

FASTS believes that a scarcity of venture capital is driving Australian inventions overseas. Unless we integrate invention, innovation and product marketing, we will not really achieve recognition as "the clever country".

It is not enough for FASTS to demonstrate how S&T can help government and industry, Dr Baker says. It has to show where available funds and programs can support initiatives without additional cost.

A small part of the new savings generated by compulsory superannuation should be earmarked as a source of venture capital for high-tech companies, as well as boosting industry investment in R&D.

"Investment in these companies has to be made more attractive," Dr Baker says. "FASTS was disappointed that the R&D Syndicate Scheme was effectively killed off in the last budget.

"The scheme brought industry, investment and research bodies into working partnerships. We would like to work with government to introduce a revised scheme."

Infrastructure in research organisations and universities is another priority area, as are measures to make science a more rewarding and attractive career.

"One of the most important steps FASTS took under Graham Johnston's presidency was to adopt a written science policy," Dr Baker says.

"It's a tribute to Graham's effectiveness, and has proved invaluable in our dealings with decision-makers. The Minister was delighted to receive such a comprehensive and broad-based document at its launch in June."

The document sets out policy in four areas: education, industry, government institutions and national facilities (including CSIRO), and university research and research training.

It is probably just what Barry O. Jones needed to win his battles back in 1984.

Dr Joe Baker

The 1995 CSIRO Medals

Chairman's Medal

The work of the Division of Animal Health team that discovered the equine morbillivirus have been recognised with the 1995 CSIRO Chairman's Medal.

Dr Keith Murray and his team — Dr Alex Hyatt, Dr Allan Gould, Dr Peter Hooper, Mr Paul Selleck, Dr Harvey Westbury, and Dr Laurie Gleeson — have achieved international acclaim for both the quality and the speed of their research.

In September 1994, an unknown disease struck a stable of horses and their trainer near Brisbane. Tissue samples were rushed to the Australian Animal Health Laboratory in Geelong where an immediate "category III alert" (the highest level) was declared.

Within the month, the team had determined that a new virus had caused the outbreak.

The morbillivirus group includes canine distemper, seal plague and rinderpest. However, the equine morbillivirus is the first human morbillivirus since the 10th century, when measles was described.

Initially, the team had to consider whether the horses were infected or poisoned. Among the more important virus possibilities were the exotic diseases African horse sickness and equine influenza. These were quickly eliminated by specific disease diagnostic tests at AAHL.

Over the next few days, evidence of virus growth was found in tissue culture. Electron microscopy identified the virus as belonging to the family *Paramyxoviridae*. Detailed electron microscopic analysis suggested that the virus belonged to the genus *Paramyxovirus* or *Morbillivirus*.

Infected experimental horses developed similar symptoms. Polymerase chain reaction and sequencing protocols confirmed that the virus was a new member of the genus *Morbillivirus*.

By October, serologic tests, serum neutralisation tests for the detection of antibodies, fluorescent antibody tests for virus in tissue culture, immuno-electronmicroscopy and immuno-histochemistry for virus in tissue culture and the lungs of field and laboratory horses had been developed. These tests confirmed that the equine morbillivirus was in fact responsible for the infection of 20 horses and two humans.

The speed and accuracy of the identification was internationally recognised as being of the highest world standard.

CSIRO is also very pleased to recognise the vital role played in the identification of equine morbillivirus by the Queensland Department of Primary Industries and Queensland Health.

CSIRO Medals

Dr Barry Harrowfield and his team — Gary Robinson and Ken Atkinson — from CSIRO's Division of Wool Technology invented, developed and commercialised the Very High Speed Carding Process.

The CSIRO Medal recognises this as a major contribution to the international wool processing industry, and to the maintenance or improvement of demand for Australian wool.

The "CA7 Card", as the manufacturers call it, uses novel CSIRO technology that enables scoured wool to be converted to a continuous assembly of disentangled fibres, known as "sliver", at more than twice the production rate of conventional cards. This significantly reduces the capital cost of the process.

Traditional hand spinners claw the fibres apart using two pinned surfaces. The modern mechanical process is based on this ancient technology, with the pinned surfaces attached to cylinders to allow continuous processing.

Over the past decade, researchers at the Division of Wool Technology have made a number of key findings relating to the speed of the various rollers and the volume of flow of fibre. In 1984, trials of these findings began at the Adelaide combing plant of G. H. Michell. This led to interest by the French company Thibeau, which called the early results "a revolution in worsted carding".

By the end of the decade, a collaborative agreement had been signed between CSIRO, G. H. Michell, the Wool Research and Development Corporation, and Thibeau. Meanwhile, research had doubled the speed of the new process.

The Very High Speed Carding Technology is an excellent example of commercialisation of CSIRO research. An Australian company gains an international foothold, CSIRO retains full title to the development, and the technology is being sold in Europe and Asia by the world's major manufacturer of wool processing equipment, with royalties returning to CSIRO.

Dr Nick Stokes and his team — Dr Chin-Hsien, Dr Xiao-Lin Luo, Dr John Mooney, Dr Zili Zhu and Dr Noel Barton — have been awarded a CSIRO Medal for their work in developing a computational fluid dynamics program called Fastflo.

The award recognises

Antennas pick up awards

Dr Bruce Thomas, from CSIRO's Australia Telescope National Facility, has received two awards for research and development of satellite technology.

His development of high-speed feed-horns used in radio telescopes and earth station antennas won the 1995 Sir Ian McLennan Achievement for Industry Award and one of the six annual Clunies Ross Awards for excellence in the application of science and technology.

Presenting the Sir Ian McLennan award in Melbourne, Victoria's Minister for Industry and Employment, Philip Gude, said: "Over the past 20 years, Dr Thomas and research teams led by him in the CSIRO Division of Radiophysics have developed Australian-based designs for antennas used in satellite communications technology.

"The expertise developed by CSIRO in partnership with various companies has resulted in a new high-technology industry in Australia, now worth $100 million."

Dr Bruce Thomas

Telstra, through OTC, scored in the international marketplace, particularly in Vietnam and Cambodia, using CSIRO antenna technology.

The same technology is helping NASA track the Galileo spacecraft.

The Sir Ian McLennan Achievement for Industry Award was established in 1985 by CSIRO's Advisory Council, a group of external — mostly industry — advisers. It commemorates Sir Ian McLennan, a former chairman of BHP.

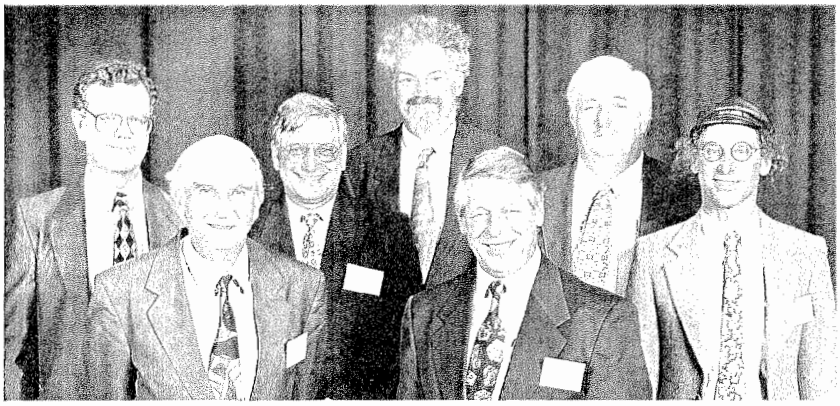
The Clunies Ross Awards, now in their fifth year, commemorate the first head of CSIRO, Sir Ian Clunies Ross.

They are chosen by an Award Committee headed by Hugh Morgan of Western Mining Corporation, who is chairman of the Ian Clunies Ross Memorial Foundation.

Dr Thomas was one of two CSIRO winners this year. Dr Robin Bedding, from the Division of Entomology, received an award for his persistence and commitment over 30 years in the development of technologies to allow insect parasitic nematodes to replace insecticides.

As a world leader in basic research on these organisms, Dr Bedding has turned laboratory curiosities into key biological control agents.

Dr Bedding's work is of great benefit to the forestry industry. It is estimated that using nematodes to control the Sirex wasp will save up to $4 billion in every 30-year rotation of Australian pine forests.



At the CSIRO Medal presentation: from left: Dr Barry Harrowsfield, Professor John de Laeter, Dr Geoffrey Syme, Dr Nick Stokes, Dr Roy Green, Professor John Mitchell and Professor Allan Snyder

Fastflo's outstanding contribution to Australian and international innovation in software development.

Many of Australia's mineral processing and manufacturing industries have a critical need to understand, control and perhaps optimise fluid flows that may involve turbulence, heat transfer, ventilation, chemical reactions and molten metals.

The modern tool for analysing these problems, computational fluid dynamics, requires the solution of equations developed 150 years ago, but which have only recently been of practical use as cheap and fast computers have become available. To describe a fluid in motion involves calculating the effect of each small portion on each other part. To achieve this, Fastflo used unstructured finite element methods, which can be used in three-dimensional situations with complicated boundaries.

To describe the physics and solution methods, Fastflo uses a high-level language called Fasttalk, developed especially for this project. The forces governing fluid motion are described by partial differential equations; Fasttalk enables the terms of which these are composed to be written down directly, so very complicated systems can be built up quickly.

The development of Fastflo was assisted by a grant from the Industry Research and Development Board. It was managed by a syndicate including BHP and the engineering software firm Compumod, which is responsible for commercialisation. In the last year, Fastflo has been licensed to 19 external users in Australia and New Zealand, and it is in use in many CSIRO Divisions.

The work of the Fastflo team has resulted in a package which on some problems performs up to three times faster than the market-leading finite element fluids package, as well as being more accurate and robust.

Dr Geoffrey Syme, a Senior Principal Research Scientist with the Division of Water Resources in Perth, has received a CSIRO Medal for his contribution to the successful application of research in the community.

Geoff Syme's research focuses on designing methodologies to measure community risk-benefit trade-offs, defining "fairness" in water allocation, and advancing economic psychological theory.

He has been responsible for refining methods for assessing public attitudes and social impact, and he has introduced new techniques in the area of environmental management, conflict resolution and economic psychology.

Dr Syme's work has attracted national and international attention, and he has succeeded in shaping or changing the agendas of national agencies and government departments.

One of the primary interests of his research is to provide realistic and practical means by which water can be managed, to provide the greatest environmental and economic gains.

In Australia, Dr Syme's work and knowledge of conflict management has been used by bodies such as Sydney Water, the West Australian Conservation Council, and the Chamber of Mines and Energy in WA.

The Australian Research Centre for Water in Society, of which Dr Syme is Director, has been invited to help the Taiwanese Government to resolve its water management problems.

In March this year, Dr Syme helped to facilitate a complex cloud-seeding agreement involving Australia, Israel, Jordan and Palestine.

Professor Allan Snyder and Professor John Mitchell from the Australian National University in Canberra have been awarded the 1995 CSIRO Medal for work done outside CSIRO.

Professor Snyder pioneered the innovative notion that a beam of light can be guided by light itself — without any intervening structures such as optical fibres — and that light beams can attract, repel and bend one another.

Snyder and Mitchell's work on light guiding light has inspired a major conceptual breakthrough.

The Snyder/Mitchell theory has very practical application to the field of communications technology. Most of us are aware of the potential of the information superhighway; fewer are aware of the impending traffic jams on the highway as existing communications networks become unable to deal with the increasing volumes of information.

Professor Snyder has come up with an answer: to use light beams to form wave guides that can steer, switch and route information already in an optical format. A new generation of switching technologies is on the horizon.

The "light guiding light" concept has been experimentally verified by researchers at the Australian National University, and the Australian Photonics Cooperative Research Centre is now developing materials and devices based on the concept.

Geneticist showed the way for women in science

OBITUARY

Dr Helen Newton Turner, eminent geneticist and early member of CSIRO staff, died on November 26, aged 87. She was a pioneer both as a scientist and a woman pursuing professional interests that were at the time a male domain.

Dr Helen Newton Turner

Dr Turner was among the first women to graduate from Sydney University when she took out an architecture degree with honours in 1930. However, the closest she could get to entering the profession was working as a typist in an architect's office.

Within two years she became secretary to Ian Clunies Ross at CSIR's McMaster Animal Health Laboratory at Sydney University.

Clunies Ross, later CSIRO's chairman, recognised Dr Turner's potential and arranged for her to go to England for a year to study statistics applied to agriculture. This was to supplement the university mathematics course she was doing at night school.

She eventually became a technical officer and then a consulting statistician. She was closely involved with the merino breeding experiments conducted by the Division of Animal Health and Production.

Helen Newton Turner was awarded a doctorate in science by the University of Sydney in 1970 for her published work *Quantitative Genetics in Sheep Breeding*. Among the many honours she received were an OBE (1977) and an AO (1987). After retiring in 1973 she maintained her association with CSIRO as a research fellow.

Bernie Binden, Director of the Cattle and Beef CRC at Armidale, worked with Dr Turner from 1969 to 1976. He said: "I would call Helen Turner the high priestess of sheep genetics research in Australia. She made her name with her landmark quantitative studies of merino sheep breeding.

"She was a rigorous scientist — someone who demanded high standards of accuracy, precision and honesty in research."

Professor Laurie Piper, Director of the CRC for Premium Quality Wool at Armidale, knew Dr Turner from 1962 when he began work under her as a junior research scientist.

"As a person, she was absolutely single-minded about her work although she did have other interests and that included things like the place of women in science and industry," he said.

"She put herself totally into her work and expected everyone who worked for her to do the same. She was very encouraging to young people; she gave them a real measure of independence to get on with doing their own thing, but always within the framework of the team as a whole and the job that it had to do."

DIVISION OF WATER RESOURCES

New Chief appointed

A geomorphologist with international standing and strong interests in hydrology, Dr Geoff Pickup, has been appointed Chief of the CSIRO Division of Water Resources.

Dr Geoff Pickup at the United Nations

Dr Pickup was previously Assistant Chief of the CSIRO Division of Wildlife and Ecology and Head of the Centre for Arid Zone Research in Alice Springs.

He is an expert in the use of digital airborne video for high-resolution remote sensing, and has worked on modelling of large-scale patterns of soil erosion, geographic information systems, and land degradation assessment using satellites.

Dr Pickup has been with CSIRO since 1981. He pioneered the application of paleohydrology to flood estimation in remote areas, and introduced more rigorous hydraulic and statistical procedures. More recently he has used multitemporal remote sensing to calibrate process models.

His hydrological interests date back to his PhD thesis on unstable river systems. He has consulted on water and sediment issues and lectured in hydrology and water resources at the University of Papua New Guinea.

Other research has involved rainfall-runoff modelling, sediment transport, and computer simulation of river behaviour and waste-disposal scenarios from large open-cut mines.

Over the last two years he has advised the Department of Foreign Affairs on the International Convention on Desertification, and has been a three-time member of Australian Negotiating Missions to the United Nations. He was also sought by the UN's Asian Group and led a taskforce that drafted the Asian Annexe to the Convention.

His other international work has included consultancies for the World Bank, the UN Economic and Social Commission for Asia and the Pacific, the UN Environment Program, and the Gulf Cooperation Council.

Dr Pickup has collaborated in experiments with the Division of Water Resources in the past. He worked with David Jupp's group on the early development of microBRIAN, and with Bob Wasson on design of the geomorphology program for the Office of the Supervising Scientist.

He took up his position in September, based at the Division's Canberra laboratory, and will hold the post until June next year when, with CSIRO's new CEO in place, a long-term appointment can be made.

Tertiary challenge ahead

Dr Kathleen Bowmer, Deputy Chief of the CSIRO Division of Water Resources, is leaving to take up the post of Deputy Vice-Chancellor at Charles Sturt University in Wagga Wagga in February.

Dr Bowmer, who holds a PhD from the University of Nottingham's School of Agriculture, became Deputy Chief of the Division in 1993.

She has conducted extensive research in the areas of environmental science, water resources and agriculture, and has been appointed to numerous consultancies and Government committees, especially dealing with waste management and aquatic ecology.

Dr Bowmer has also published widely and has been awarded the prestigious POL Eureka Prize in Environmental Science for her outstanding achievement in Australian science.

Dr Kathleen Bowmer

The Vice-Chancellor of Charles Sturt University, Professor C.D. Blake, says Dr Bowmer has a strong background in research and research management and has worked actively with the university sector in an honorary professional role and supervising postgraduate students.

"The university has had a long association with the CSIRO and quite clearly this is set to continue with Dr Bowmer's appointment as Deputy Vice-Chancellor," Professor Blake said.

"More importantly, Dr Bowmer's strong connections with research institutions and industry throughout Australia will be a of great benefit to the university as it seeks to build its research profile."

Dr Bowmer, who describes her research interests as very broad, is looking forward to moving back into the university sector.

"Having worked with Australia's leading research agency I am very interested in helping to raise the university's research profile, and encouraging critical analysis as a basis of the research culture," she says.

"I also see my role as ensuring that research is well integrated with the teaching role of the university."

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