CoResearch

No. 329 December 1989 — January 1990 CSIRO's staff newspaper

CSIRO AUSTRALIA

OA campaigns for science

The CSIRO Officers Association has virtually completed a letter-box drop of 350,000 leaflets in nine marginal electorates around Australia as part of a campaign to make politicians pay attention to science.

Recent opinion polls have shown that Australians on the whole are enthusiastic about the benefits offered by science, but federal science policies are still allowing our research and development effort to lag behind that of similar countries.

The leaflet urges voters to use their power over vote-hungry politicians to force a higher profile for science into agendas before election time.

John Stephens, President of the Officers Association, calls our present R&D lag 'an alarming situation', and believes that the most efficient way to make government, and business, respond is through the electoral process.

The hard-hitting leaflet begins with a bleak prospect — Australia in crisis — outlining that crisis as follows:

- Interest rates are exorbitant, especially on home loans.
- Our international debt is growing beyond all reason, our credit rating is in question and our dollar shaky.
- Unemployment and inflation both remain far too high.
- Our environment is being polluted and degraded at an ever increasing rate.
- There is far too little 'value added' by Australian industry to our agricultural and mineral exports.
- Australian manufactured goods are generally uncompetitive both here and overseas.
- There is too little productive investment with too much money going into company takeovers.

If this situation is to improve, argues the leaflet, we must spend more on scientific research and development. This will bring us internationally competitive industries and better employment opportunities as well as helping to preserve our environment.

Such an increase in expenditure, it claims, is not a cost, but an investment in our future.

- Australia must at least double its R&D effort just to stay in touch with international competition.
- Australian business must become more enterprising in its willingness to take up the results of Australian R&D in new or improved processes and products instead of leaving overseas interests to reap the benefits.
- The government must take absolute responsibility for finding the necessary funds. Industries that fail to volunteer their fair share should be levied.
- The R&D needs of all industry sectors and all matters of public interest, such as the environment, must be met. Both environmental research and basic research must continue to be funded by the government.
- Our young people must be attracted once again to careers in science, technology and engineering. In addition, better education for these careers must be a national priority.
- R&D must be a national enterprise to spread the risks and the rewards while focussing the effort productively. This is much the case already in agriculture and the minerals industry and it should be extended in an improved form to manufacturing. Industry, employees and research workers should all be active partners with government in its management.

After stressing the urgency of the problem, and telling the voters what steps need to be taken to overcome it, the leaflet reinforces its message with a reminder that polls show public opinion to be well and truly on the side of science:

- more than 80 per cent of Australians support a massive increase in our R&D effort; and
- 85 per cent would like to see scientists and engineers directing that effort.

\# \# \#

The 350,000 letter-drop is only part of a continuous campaign by the Officers Association to raise science awareness in the community. Early this year they distributed a leaflet on the importance of CSIRO itself in solving Australia's problems, and they also conducted their own opinion poll to gauge public feeling about science issues.

The Association also lobbies politicians with what John Stephens calls 'considerable intensity' and speaks up strongly on behalf of working scientists at the National Science and Technology Group meetings.

All of this, says John Stephens, is a response 'not just to our situation but also to Barry Jones describing us as wimps some years ago.

'We have been challenged. We have picked up that challenge and by God we're going to run with it from now on.'

STOP PRESS

CSIRO Medal winners announced

The names of this year's CSIRO Medal winners were released on 27 November:

- the raw wool measurement team from the Division of Wool Technology and the wool industry (the late Dr M W Andrews, Mr D Charlton, Mr H G David, Mr S A S Douglas, Mr J F P James, the late Mr B H Mackay, Mr R A Rottenbury, Mr R B Whan and Dr K J Whitely) — for the introduction of objective measurement into the marketing of Australian raw wool;
- Dr W J Peacock, Chief, Division of Plant Industry — for leadership of the Division;
- the SIROFLOC team, Division of Chemicals and Polymers (Mr N J Anderson, Dr B A Bolto, Dr D R Dixon, Dr L O Kolarik, Dr A J Priestley, Mr W G C Raper and Dr D E Weiss) — for development of the SIROFLOC process for preparation of potable water;
- the High Frequency Radar Division, Surveillance Research Laboratory, Defence Science and Technology Organisation (special mention for Dr G F Earl, Dr M G Golley and Mr J A Strath) — for development of the Jindalee Over the Horizon Radar.

Next month's *CoResearch* will carry the full story and pictures.

New seeder released commercially

A revolutionary band seeder designed to improve legume establishment in native pastures is about to be manufactured commercially.

The new seeder was launched at the Annual General Meeting of the Australian Meat and Live-stock Research and Development Corporation at Rockhampton on 29 November. It was developed by Dr Sid Cook of the Division of Tropical Crops and Pastures and Mr Peter Walsh, an engineer with the Queensland Department of Primary Industries.

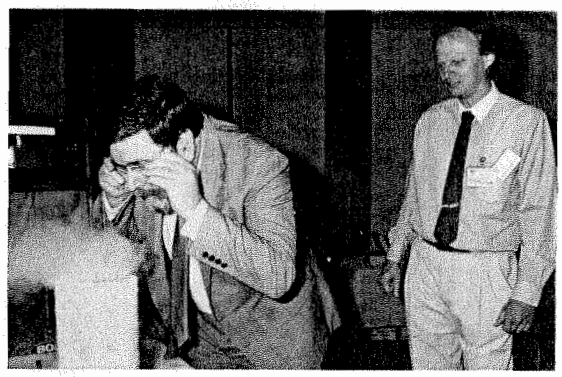
The Division has chosen Connor Shea Napier, a large farm machinery firm, to manufacture the machines, and some should be on sale this summer.

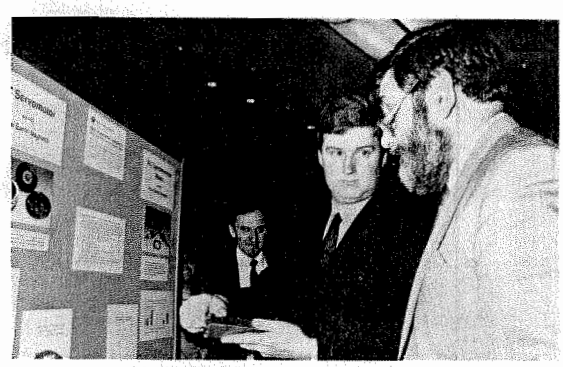
The device sows a band of seeds to an optimum depth of 10 millimetres, at the same time placing a small amount of fertiliser below the seed to boost legume growth, and applying a 50 centimetre herbicide strip on the soil surface to reduce root and shoot competition. The bands are sown 1·5 metres apart.

Band sowing also offers environmental advantages. 'It retains litter and trash on the surface and causes very little soil disturbance' Dr Cook said. 'People from all over Australia have been asking me about it.'

Soil conservation experts are hailing the technique as a major step in soil management and land care.

Industrial Technologies Display





The Institute of Industrial Technologies mounted a striking display of the latest in CSIRO technology at Parliament House in Canberra on 24 October.

Each of the Institute's Divisions set up a stall to display its wares to the public and media.

Scientists and their business partners were on hand explaining CSIRO's ventures in the private sector from both a scientific and a commercial point of view.

The exhibition was well received, especially the more spectacular displays.

\# \# \#

Above, top, Science Minister Barry Jones tries to glimpse a piece of metal being levitated by superconductivity equipment set up by Dr Stephen Collocott of the Division of Applied Physics.

The middle picture seems to show Shadow Minister for Science, Peter McGauran, looking to Barry Jones for scientific insight while Dr Colin Adam, Director of the Institute, stands well back. Perhaps Dr Adam knows that Mr McGauran is about to put the new high-tech magnet to a very low-tech use against his political rival? (Bottom picture.)

What they are really doing is pitting their strength against that of the powerful rare earth magnets being developed by the Division of Applied Physics.

From the Chief Executive

A column by Dr Keith Boardman

I am writing this column on my return flight from Seoul after leading the Australian delegation on a Science and Technology mission to the Republic of Korea. The visit follows on the signing of a Memorandum of Understanding for Science and Technology co-operation between the two governments.

The nine-person delegation was broadly based, with representatives from DITAC, CSIRO, ANSTO, universities and industry, and it received excellent support from the Ambassador and his staff at the Australian Embassy in Seoul.

We were received by the Minister of Science and Technology and visited the major research institutes in the public sector in Seoul and Taedok Science Town, located 170 km from Seoul, and a private sector institute.

Taedok Science Town is a major development and many of the public sector research institutes are being transferred there, together with a number of private sector institutes.

Korea has a strong central bureaucracy and a number of very large companies that dominate the Korean economy. R&D is very much market-driven and there is strong interaction between the public sector research institutes and private companies.

Korea has been very successful over the past two decades in developing a strongly competitive export-oriented manufacturing industry based on the acquisition of foreign technology and a low wage structure. Korea's relative cost competitiveness is now declining because of increasing labour costs, industrial disputation and rising inflation. Greater emphasis is now being placed by government on the promotion of basic sciences and the development of a capability to develop new technologies, with less dependence on the technologies of Japan and the USA.

The delegation gained the strong impression that basic science is generally weak in most of the research institutes and the universities, with a shortage of well trained researchers. But a determined effort is being made to attract back experienced expatriate scientists from abroad, mainly from the USA, and there are plans to greatly expand the funding of post-doctoral fellowships for Korean scientists to gain experience in foreign laboratories. There will be increasing opportunity for Korean post-doctorals to join Australian laboratories, particularly in priority areas for Korea and where Australia has a strong international reputation.

A survey of Koreans on the subject of Australia, carried out by the Australian Embassy, showed a great lack of knowledge about Australia, but the scientists we met were generally aware of our scientific capabilities.

CSIRO is very highly regarded for its achievements in strategic basic research and several of the research institutes we visited would like to model their future directions on CSIRO. It is ironic that CSIRO, which is so highly regarded as a public sector research organisation in so many countries, has suffered substantial funding cuts over the past five years and poor government support. It came as no surprise that the priority R&D areas in Korea are similar to those of other advanced nations, namely, new materials, biotechnology, fine chemicals and information technology.

I believe there are opportunities to develop a better relationship with and knowledge of Korea by the exchange of scientists, initially in areas of basic science, and the acceptance of Korean post-doctoral fellows. But in the longer term, if Australia is to obtain greater benefit from co-operation with Korea, we must learn to collaborate in strategic areas which may be commercially sensitive, and share the development of the intellectual property for mutual benefit.

With the help of Directors, I have set down my vision for CSIRO and it will be considered by the Board at its November meeting. I propose to distribute a statement to all staff before the end of the year.

M Keith Boardman

Apologies

In the October issue of CoResearch *the third letter in the Letters to the Editor section was attributed simply to I Lowth and R Lockwood. Two lines were omitted, reading 'B Mithen' and 'Finance and Services Unit, Corporate Centre', respectively.*

###

The feature on development of poultry vaccines in the August issue of CoResearch did not mention the contribution of the team from the Division of Biotechnology at Clayton. Scientists involved earlier in the Infectious Bursal Disease Virus (IBDV) project were: Mr G. M. Black, Dr M. L. Britz, Dr J. I. Skicko, Dr H. Y. Cheung, Ms N. Ivancic, Dr R. A. Irving and Dr J. L. Atwell. At present, Dr John Skicko and Mr Andrew Wolfe are continuing fermentation scale-up work for the project, and are playing a crucial part in the successful development of the project.

Letters to the Editor

Dear Editor,
Video recordings are being used increasingly in the laboratory and in the field to investigate various topics in biology such as: predation, scavenging, habitat use, responses to stimuli, and behavioural interactions. Video is used particularly in difficult situations, e.g. deep water, night time under artificial light and where disturbance is to be kept to a minimum.

I intend forming a register of video users, mainly to establish a forum for communication of ideas and methods and to let users know about other users. To this end I would like a short summary from each user, giving on a single A4 page:

Name and affiliation
Project – objectives
Brief outline of work
List of equipment
Comments on problems

Once I have a reasonable response from Australia's universities and research institutions, I will compile the information and send copies to those people who have responded.

Ted Wassenberg
CSIRO Marine Laboratories

Dear Editor,
I am sure many of your readers will be intrigued by the illustration on this year's CSIRO Christmas card. The caption says 'Nature's delicate balance can be supported by the scientific knowledge born of Mankind's insatiable curiosity'.

I thought the best ecologists were telling us the 'balance of nature' is a greenie myth.

William Wordsworth can provide a more appropriate caption:

Sweet is the lore which Nature brings;
Our meddling intellect
Mis-shapes the beauteous form of things:
We murder to dissect.

Nick Alexander
CSIRO Information Services Unit

... about the Editor

Dear Editor,
I agree with Liz Tynan that we need much more face to face communication between central and divisional staff.

As someone who has spent a number of years in divisions and at Limestone Avenue, I know that both areas have people who give excellent service to the real business of CSIRO – research.

I have begun a small program to bring the two places together by taking members of the Human Resources Branch out into the field whenever possible. The response of these people has been marvellous – and the divisional people are only too ready to show them around and discuss issues.

I am now talking to other people here at Limestone to see what we can do to take this a bit further, to involve people from all central groups and get them out and about.

We are, after all, one Organisation ... at least, that's what I'm told!

Wendy Parsons
Institute of Natural Resources and Energy

Dear Editor,
Dissatisfaction of staff in divisions in relation to the corporate centre continues – fuelled by the view that there are two classes of staff in CSIRO: the 'haves' in the corporate centre and the 'have nots' in divisions.

While centre staff get more pay for the same work and shelter themselves from budgetary constraints, they can expect little sympathy from divisional staff. For example, who in the corporate centre goes without a computer if he or she really wants one? Computing consultants – reputedly not very good ones at that – are hired for exorbitant fees compared with an ES doing the same job in the division, and are then provided with PCs (what division can afford that luxury?). Meanwhile, some of the most senior scientists in the Organisation cannot afford to buy even a modest PC or other basic piece of equipment. To add insult to injury, the budgetary software developed within the centre is so poor that some divisions have been forced to develop their own.

A second problem is the 'faceless' image of corporate centre staff, referred to by Liz Tynan. What do they do and for whom? Presumably they are helping divisions to be more relevant and operate more efficiently in the service of the country? If this is the case, their value would be best tested by applying the 'consumer pays' principle to their services – as the centre did so eagerly with the Division of Maths and Stats. Divisions could receive the whole budget allocation and contract the centre to provide the service they need. In this way, projects in the centre would compete on the same basis as individual research projects for goods and services. The centre would operate in the same financial environment and have the same standards of accountability as divisions. This would help them to better understand the conditions under which most of CSIRO functions.

The pity about the continuing antipathy of divisional staff to the corporate centre is that individuals in the centre feel personally slighted. As in any other organisation, most of the staff are no doubt capable and hard working. Unfortunately, as long as the centre maintains the present inequities, it will be seen to be inhabited by self-interested pariahs who travel business class while the rest of us go economy, if at all.

R W Sutherst
Chief Research Scientist
Division of Entomology

Dear Editor,
I write in support of Liz Tynan's innovative approach to making the corporate centre more relevant and in tune with the operational wing of the Organisation, a wing that has been severely clipped in the past few years.

Unfortunately Liz, one week per year is not long enough to provide CC staff with the quantity and quality of insight needed. I think it requires at least 6-12 months in a division to achieve a result. Better still, they could be more mobile and after, say, three years in CC would have to spend a compulsory year in a division, i.e. a mini cultural revolution. (The same may be said for institute staff).

At the time of the allegedly large restructuring of head office (now CC), I took time out to make this point and actually photocopied pages from Drucker that said one of the golden rules of management was not to appoint people to corporate centres who had not cut their teeth in operations. I know it got there because someone rang me and said they would 'get back to me'. I wonder what happened.

A Liz Tynan type plan, or variation on it, has a much greater utility than merely solving the 'us and them' outlook. It would rapidly lead to the realisation that more functions should be devolved to divisions or done away with altogether and that CC staffing levels could be reduced and savings generated put towards the research effort. Has anyone seen any additional research funds as a consequence of the last one?

Good on you Liz – pity you're going.

J E Vercoe
Assistant Chief
Division of Tropical Animal Production

Dear Editor,
I would like to express my admiration and thanks for the tremendous job that Liz Tynan has done for the staff of CSIRO through her editorship of *CoResearch*. In addition to transforming a routine company journal into something considerably more lively and informative, she has actually helped to maintain a 'CSIRO culture'.

The introduction of the two class society (big M management vs staff) to CSIRO as part of the McKinsey problem has caused considerable alienation amongst scientists towards Corporate and Institute entities. The forum that Liz provided for disparate points helped to maintain some hope that there still existed an organisation worth saving as well as to reassure staff that the bulk of their colleagues were alive and sane, albeit somewhat discouraged. The fact that this was done despite strong pressure for *CoResearch* to present a Management point of view is all the more cause for admiring the job that she did. It was not without cost.

Good luck Liz and also good luck to the new editor!

Art Raiche
Division of Exploration Geoscience

More letters on p.6

A Matter of Opinion

This month's point of view column comes from Dr Alister K Sharp from the Division of Food Processing.

Like many other staff, I am dissatisfied with the recently introduced CSIRO bonus scheme (Policy Circular 89/6, PB12/1/4, 25 May 1989). I do not believe this scheme will succeed in achieving its stated aim of encouraging staff to commercialise their inventions and I fear that it will inhibit our future research.

Under the bonus scheme, at least 20 per cent of all income derived from royalties and licence fees is now paid as cash to staff who 'made a significant contribution to the achievement' that earned the income. A further 30 per cent is now 'used to recognise significant achievements of national benefit'. The scheme recognises not only scientific contributions, but also those that 'may have been to the management of a research project'.

I agree with the principle that part of income generated by royalties, etc, should be returned to the people who created it. I believe, though, that this income should be used to supplement research funds and not become payments into individual pockets. I object to the scheme for the following reasons:

1. As scientists, we know that we are easily motivated, requiring only a fair salary and good working conditions. CSIRO researchers are not 'in it for the money'. Our best motivation is to have access to adequate equipment, adequate technical support and adequate travel funds. Our working conditions have been devastated in recent years and general destruction to morale is obvious. The present bonus scheme not only fails to correct this situation, but further exacerbates it.

2. The present reclassification scheme already can be used to reward staff for outstanding performance such as successful commercialisation.

3. The scheme will lower the standard of CSIRO's research by inhibiting collaboration. Creativity is enhanced by discussion and good science requires peer review. If it were true that CSIRO staff could be motivated by cash rewards, then it follows that, being intelligent, we would attempt to maximise those rewards by sharing them with as few others as possible. The bonus scheme, therefore, will reduce discussion and so hinder scientific development.

4. Most CSIRO scientists have no training in commercialisation (Sirotech was established in recognition of this). Should the Board wish to improve this aspect of CSIRO's performance, I suggest that it start by providing adequate training in the skills required for commercialisation.

5. Successful commercialisation of inventions is largely out of the control of CSIRO staff. Those of us with experience in commercialisation have found that success depends more on financial and commercial factors than on the technical merit of an invention. There are many instances where the commercial partner has shelved an invention to protect an existing product from competition.

6. Even if a cash bonus did act as a motivation, the time between developing an invention and the return of royalty payments is too great for the promise of payment to be effective. Between the time of invention and the receipt of royalties or fees there can be a delay of 10 or even 15 years, to refine the invention, to seek commercial partners, to make commercial and financial arrangements and to build plant; CSIRO staff rarely are in a position to reduce this delay. Is it reasonable to believe that even CSIRO staff can be motivated by an offer of a possible reward in 10 to 15 years?

7. There is a danger that the CSIRO bonus scheme will lead to a reduction in the real value of general salaries. The CSIRO scheme rewards only selected staff, and so operates quite differently to the bonus scheme adopted by Qantas, and proposed for other Government businesses, which pays all staff a bonus based on before-tax profit.

8. Conflicts of interest are inevitable when those designated to administer the scheme also are potential beneficiaries. The Policy Circular explained that 'the size of bonus paid to each nominee shall be recommended by the Chief' (paragraph 11), yet 'Institute Directors will take into account any contribution by the Chief' (para 13), and again 'an Institute Director may be eligible for a bonus' (para 14).

9. By the time a piece of research reaches commercial fulfilment, many people have contributed in many different ways – scientific, technical support and commercial, yet the Policy Circular gives no guidelines for the allocation of payments between different groups contributing, or among the various individuals of each group.

10. Rather than proceeding by a licence or royalty agreement, commercialisation may be effected by means of a one-off cash payment to CSIRO. In such cases, no bonus would be paid under the terms of the CSIRO bonus scheme.

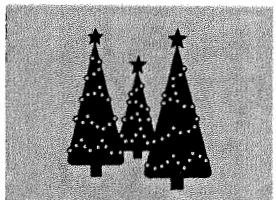
11. Allocation of cash payments will be contentious when the achievement that generates income is not a simple, one-off invention, but rather the result of many years of effort by various staff members, some working throughout the project and others for only part.

12. Allocation of payments will be even more contentious when there has been collaboration between divisions (chiefs will have to argue their division's relative contributions) and when the divisions are in different institutes (institute directors are designated to mediate the scheme).

13. The policy circular gives no guidelines about how 'achievements of national benefit' are to be identified from among the many non-royalty-earning achievements of CSIRO. Presumably national benefits include both achievements that have a cash value but don't earn royalties (such as improved agricultural practices that increase Australia's exports) and those with no cash value (such as preservation of the environment). How are rewards to be allocated between such diverse 'achievements of national benefit'? Are achievements of national benefit to be recognised retrospectively, as are commercial achievements, and if so how far back in time?

14. Finally, and unequivocally, I absolutely reject *any* scheme in which 'there is no right of appeal in relation to the award or size of a bonus' (para 15).

Editor's note: As always, comments from readers are most welcome. Send your letters to the address on the back page.



Season's greetings to all staff from the new editor!

New products for rock stress measurement

The Division of Geomechanics has come up with two new developments in rock stress measurement that are looking good as export earners. Chief of the Division, Dr Bruce Hobbs, released details of the new techniques on 27 October.

'CSIRO' he said 'has been among the world leaders in rock stress measurement for more than 10 years. Now the Organisation is building on that reservoir of expertise to bring the new techniques to the market-place.'

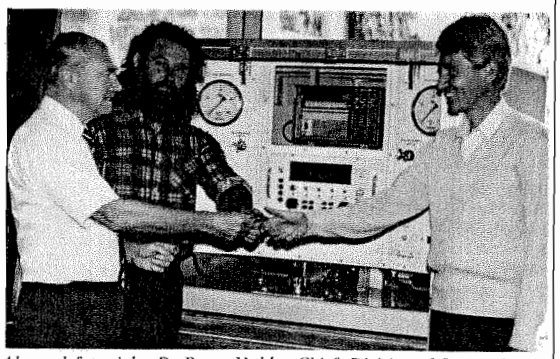
The first initiative was the manufacture and marketing of hydraulic rock stress measurement systems as a joint venture between CSIRO and Strata Tek Pty Ltd.

Mr Jim Enever, Program Manager of the Sub-Surface Reservoir Engineering Program at the Division, has been working closely with Strata Tek in the commercial exploitation of CSIRO's hydraulic fracture expertise.

'These activities are now bearing fruit', said Mr Enever. 'We have just sold one of the systems to ISMES, Spa, an Italian geotechnical organisation responsible for major civil engineering investigations.'

The second foray into the market-place is a recent agreement with Mindata Pty Ltd, an Australian-owned group manufacturing and marketing geotechnical instrumentation developed by CSIRO and others.

Mindata have representatives in Canada, the USA, the UK, and Sweden, and will now market CSIRO's 'Minifrac' system, a low-cost, miniaturised hydraulic fracture system for routine process control applications in the mining industry.



Above, left to right, Dr Bruce Hobbs, Chief, Division of Geomechanics and Mr Jeff Edgoose, Principal of Strata Tek, hand over the keys of one of their new rock stress measurement systems to Dr P Devin of ISMES Spa.

Water Resources wins MIS prize

The Division of Water Resources in Perth is the proud owner of a new NEC microcomputer, thanks to an idea from two members of the Floreat Park laboratory.

John Bright and Lloyd Townley were the joint winners of the Great Systems Ideas Competition run recently by the Management Information Systems Branch in Canberra.

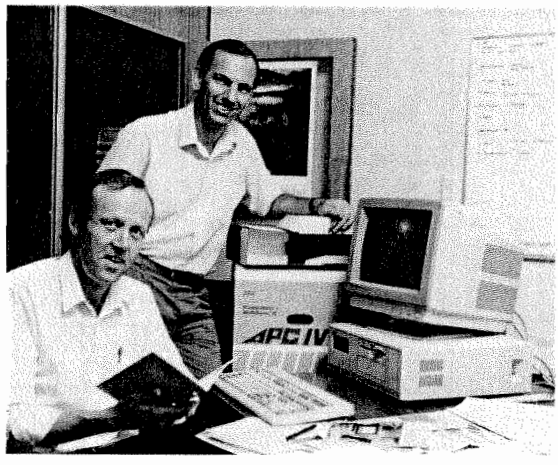
The competition asked for ideas for new systems, or for improvements to existing systems, that would help users do their jobs more effectively and efficiently. A number of high quality ideas were entered in the competition, which was judged by a panel of senior officers with divisional, institute and MIS Branch backgrounds.

The winning idea was for a system that helped simplify the preparation of submissions for external research funds. The system proposed would also ensure that a division's external funding proposals would be consistent.

Apart from the winning entry, four others were highly commended by the judges. These were from:

- **Jill Colefax, Tropical Ecosystems Research Centre, Darwin.** Jill proposed a local system for simplifying and speeding up payment to casual employees.
- **Martin Gilby, Division of Animal Health, Parkville.** Martin's idea was for a salary projection system for use in preparing grant applications.
- **Olivia Lee, Division of Radiophysics, Epping.** Olivia suggested a facility that would automatically start computerised tasks at a set time.
- **Patricia McGee, National Building Technology Centre, North Ryde.** Patricia proposed the inclusion of a 'date for payment' field in the invoice module of TIMS, the divisional accounts-payable system.

Judging by the quality of the entries, the competition was a resounding success and the MIS Branch will be having another look at some of the best ideas with a view to new and better systems in the future.



Above, John Bright (left) and Lloyd Townley, Division of Water Resources, Perth, unpack the computer they won in the Great Systems Ideas competition thought up by MIS branch in Canberra.

Industrial Participation Plan is launched — but will it float?

Readers will remember last month's four-page insert in CoResearch *on the upcoming Industrial Participation Plan. Well, now it's here, but what sort of difference, if any, is it going to make to our working lives?*

The following article was contributed by the Secretariat of the CSIRO Consultative Council. The editor would like to hear from readers what they think of the Plan. Is it a solemn farce, a real breakthrough, a well-intentioned but naive product of wishful thinking, a sop to the workers, the best thing since Glasnost, the same thing as Glasnost, what we ourselves make it, or what? Letters please!

Consultative Council report

The 24th meeting of CSIRO's 10-year-old Consultative Council was held at the Corporate Centre on 31 October and 1 November.

In conjunction with the meeting a function was held on 1 November to launch both the CSIRO Industrial Participation Plan and the Occupational Health and Safety Agreement. The documents have been produced, under the guidance of Council members, to promote greater participation, consultation and communication at all levels of the Organisation.

The strategy of the OHS agreement is to involve all line managers and individual staff members in the identification and prevention of health and safety problems.

The IP Plan and the OHS Agreement were formally launched by Science Minister Barry Jones. Reading a speech written for Neville Wran (who was sick on the day) Mr Jones emphasised management's commitment to the provision and maintenance of the highest standards of workplace democracy, harmony, and health and safety.

Carole Popham, General Secretary of the CSIRO Technical Association, also spoke, affirming the commitment of the staff associations to a joint approach to promoting improved consultation and communication in the Organisation.

Above, Carole Popham shows Barry Jones the new Industrial Participation Plan booklet.

The IP Plan promotes the establishment of divisional consultative committees aimed at providing opportunities for staff to be consulted on, and contribute to, decisions that affect them and their work environment.

The Council members believe these committees should go some of the way towards improving communication and consultation practices, but they also hope CSIRO people in general will adopt a more participative, co-operative approach. If such initiatives are to have any chance of success both staff and management must be willing to work together in pursuit of common goals. And that willingness will depend on mutual trust and openness.

We hope that improved levels of participation will make for better-informed decisions, a greater commitment and sense of ownership of new policies and practices, raised morale and an altogether more satisfying and productive workplace. The Plan is aimed at giving people the chance to contribute their full range of expertise and skills.

The Council will continue to operate as the main forum for consultation between staff associations and management in CSIRO. Among the most important issues we discussed at this last meeting were

- developing a human resources strategy
- improving appeals and grievances processes
- considering employee development and career planning initiatives
- releasing staff for union activities
- reporting on EEO, OHS, and the Personal Counselling Service activities.

Information on all these will be sent out soon, and next month's *CoResearch* will carry an article from us on the new human resources strategy.

Wool Tech Workshop

Above, left to right, Dr Alan Donald, Director of Animal Production and Processing, Dr Peter Saul, Strategic Planning Group Ltd, and Dr Vince Williams, Manager, Planning and Communication, Division of Wool Technology.

Williams

Director of the Institute of Animal Production and Processing, Dr Alan Donald, was among those attending a Strategic Planning Workshop for the Division of Wool Technology.

The 22 division members met at the Bellinzona Country House, Hepburn Springs, Victoria, for the three day workshop in September.

Because of the pilots' dispute, seven memberrs of the Sydney Laboratory and the workshop facilitator, Dr Peter Saul (of Strategic Consulting Group Pty Ltd) drove from Sydney. They were welcomed in Albury on the Sunday evening by a torrential storm which blacked out the city.

The Division Chief, Dr Whiteley, assistant Chiefs, program leaders and some project leaders, with senior divisional and laboratory administrative staff from Geelong, Melbourne and Sydney laboratories, spent three very fruitful days clarifying divisional objectives in research, technology transfer, funding, communication, people management and corporate development.

Calling all hoarders of back copies of* Coresearch. *Jeff Prentice, the new communication manager for the Division of Mathematics and Statistics, is missing some issues from his collection.

Those issues Jeff would like to get hold of are: No. 185 (October 1975), 234 (October 1980), 235 (November 1980) and 295 (September 1986). Anyone who has these copies should forward them to Jeff at Maths and Stats, PO Box 218, Lindfield NSW 2070.

Industry award for COALSCAN

Dr Brian Sowerby, Chief Research Scientist with the Division of Mineral and Process Engineering at Lucas Heights, is the winner of this year's Confederation of Australian Industry's Award for Outstanding Achievement in Energy Research, presented on 6 November.

The award recognises the achievements of Dr Sowerby and his team in improving the efficiency of the coal processing industry in Australia, especially through COALSCAN, an innovative ash-content guage estimated to have been worth $158 million in productivity gains for Australia in the past five years.

Dr Sowerby disliked the fact that the award was given to him alone, and stressed the team nature of the achievement, particularly mentioning Mr John Watt, Deputy Chief of the Division, and Dr Nick Cutmore, one of the scientists involved in the work.

The new Industrial Participation Plan featured at left is only part of a developing human resources plan for CSIRO. The article below, submitted by the General Manager of Human Resources, Mr Arthur Blewitt, offers some background, and foreground, to the issue.

Human resources plan takes shape

Following a request in May from the CSIRO Board that a human resources strategic plan be developed for CSIRO, a working party made up of representatives from Divisions, Institutes, the Human Resources Branch, and the Staff Associations has consulted widely to determine the major human resources issues and develop an appropriate framework for human resources management in CSIRO.

A discussion paper outlining this framework will be submitted to the Board in December and is expected to be widely distributed in the new year. A White Paper will then be prepared by mid 1990.

The working party visited a sample of Divisions to discuss the development of the plan, and gave out questionnaires to get feedback on issues they had found to be of most concern to staff. The results are being analysed now.

The strategic plan is designed to increase CSIRO's productivity by improving workplace planning and staff satisfaction. It will make human resources policies more effective by linking them into the corporate planning and budgeting processes.

A few of the issues that have emerged as most important to staff are

- direction/culture of the Organisation
- career planning
- rewards and salaries
- tenure
- training
- mobility and separation of staff.

These will be given particular attention in the discussion paper coming around early next year. The paper will give all staff a chance to contribute to future human resources activities.

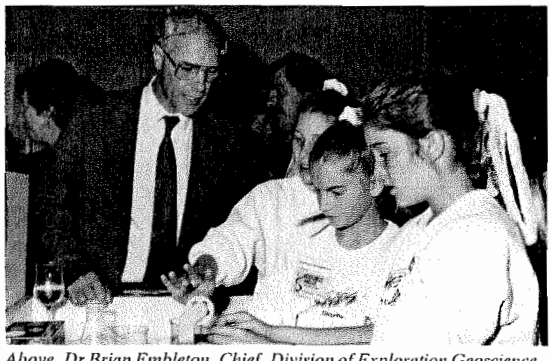
New centre for science-minded school kids

On Sunday 15 October the Western Australian CSIRO Education Centre opened its doors to the public, especially the school-going public.

Unlike the other Science Education Centres — CSIROSECs — scattered around the country as part of CSIRO's Education Programs work, this one has been created inside Perth's large Scitech Discovery Centre to offer an even greater wealth of facilities to its young clients.

The laboratory conducts experiments and interactive demonstrations for upper primary and secondary school students and uses equipment not normally found in school laboratories.

John Dawkins, Minister for Employment, Education and Training, spoke at the opening about the low numbers of top Australian students choosing science as a career. He saw the CSIROSECs as a positive step towards stimulating student awareness of science and its importance to Australia's future growth and economic development.



Above, Dr Brian Embleton, Chief, Division of Exploration Geoscience, with members of CSIRO's Double Helix Science Club for school children, at the opening of the new CSIROSEC in Perth. Club members did much to help make the opening a success.

Dr Brian Embleton, Chief of the Division of Exploration Geoscience, gave a speech in which he praised the Manager of the new CSIROSEC, Robert Namestnik, for the impressive quality of the centre and especially for the remarkable speed with which he had been able to prepare it for the public.

CSIRO research earns Fellowships

Seven CSIRO scientists were made Fellows of the Australian Academy of Technological Sciences and Engineering on Wednesday 4 October at the Albury Convention Centre in Albury, New South Wales, at an evening ceremony following the Academy's Annual General Meeting.

Dr Graham Allison, Chief of the Division of Water Resources — for his major contributions in the field of applied hydrology.

His achievements include the development of methods for determining the source of both surface and sub-surface waters and for evaluating ground water recharge and discharge rates.The new methods have attracted national and international attention and are widely used.

Dr Tom Denmead, Senior Principal Research Scientist at the Centre for Environmental Mechanics — for his international eminence in physical studies of plant ecology.

He has also made contributions of considerable practical importance to the understanding of the transfer of energy, water and gas between plants, soil and the atmosphere.

(Dr Denmead's work was also recognised by a Fellowship of the American Society of Agronomy. See p.8)

Dr Raymond Jones, Acting Chief of the Division of Tropical Soils and Pastures — for major contributions to animal science through his discoveries regarding tropical pastures. He identified a micro-organism in the rumen of Hawaiian goats that enabled Australian stock animals to thrive on nitrogen-rich plants.

His discovery has also brought benefits in South East Asia and Africa.

Dr John Lowke, former Chief Research Scientist at the Division of Applied Physics — for his outstanding contributions to the basic understanding of the behaviour of electrons in gases and the properties of electric arcs.

This work has had practical impact in industry in such areas as circuit breakers, arc lamps and arc welding, and has gained international acclaim.

Dr Dieter Plate, Assistant Chief of the Division of Wool Technology — for distinguished research contributions and outstanding leadership in the field of textile engineering.

Dr Plate has been responsible for major advances in the processing of Australian wool, particularly the 'Sirospun' yarn-spinning system, one of the most important developments in worsted yarn production in the last 40 years.

Dr Reginald Taylor, Senior Principal Research Officer at the Division of Soils — for research contributions of notable practical importance in soil science, the preparation of industrial catalysts, the treatment of industrial wastes, and medical technology.

Dr Brian Tucker, Chief of the Division of Atmospheric Research — for his contributions, through leadership and personal research, to all the main branches of meteorology.

Dr Tucker's leadership in the planning and implementation of the Global Atmospheric Research Program was formally recognised in the election.

Also cited was the uniquely successful role Dr Tucker had played in developing community awareness of the potential implications of the greenhouse effect, and of the need for research on the issue as a national priority.

CSIRO OVERSEAS TRAVEL AWARDS FOR TRADES, TECHNICAL, PROFESSIONAL (NON-RESEARCH) AND ADMINISTRATIVE SERVICES OFFICERS

Applications are now invited for CSIRO Overseas Travel Awards, which provide opportunities for staff to gain training and experience related to their careers.

Since the inception of the Awards in 1977, a number of staff have benefited from overseas study. The Board and Executive Committee place great importance on the provision of opportunities for developing CSIRO staff. These Awards are made available from four broad categories: trades, technical, professional (non-research) and administrative services officer.

Application forms and information for the Award are now available from the CSIRO Employee Development Unit, Phone (062) 48 4174.

Applications must reach CSIRO Employee Development Unit, on or before 5 January 1990.

ENQUIRIES:
Martin Smith: (062) 48 4172

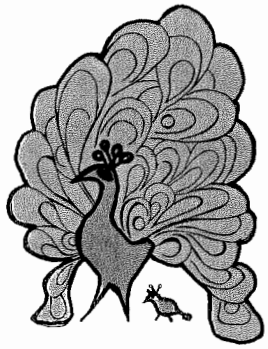
Excellence breeds excellence

When Plant Industry Chief, Dr Jim Peacock, was presented with his Bicentennial BHP Award for the Pursuit of Excellence in February last year, he didn't spend the $40,000 that came with it on drinks for the boys. ... Or did he?

He invested the money in a fund, but the interest on that fund went towards yearly prizes for his staff, to reward *their* pursuit of excellence.

The first Chief's Awards for the Pursuit of Excellence ceremony was held on October at Forestry House in Canberra, each winner being presented with a peacock feather and a cheque for $1,000.

The Award for Excellence in Research went to Dr Jim Haseloff for his work on the development of Gene Shears, the breakthrough in genetic research that has led to the largest commercial venture ever entered into by CSIRO — its partnership with the French company, Limagrain.



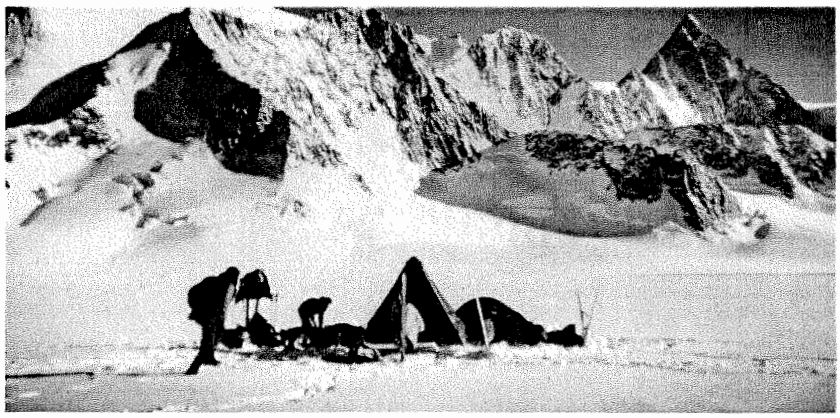
The winner in the Excellence in Technical Support category was Mr Craig Patrick, of the Division's Cotton Research Unit, for the major role he played in developing the Siokra and Sicala cotton varieties that now account for 70 per cent of Australia's cotton crop.

Ms Jen Price won the award for Excellence in Other Support for her part in changing the work atmosphere in the Division's Phytotron to one of real enthusiasm.

Book review

The Loneliest Mountain

By Lincoln Hall. Photographs by Jonathan Chester
Published by Simon & Schuster



The photographs in this new book portray the huge and portentous Antarctic as a serene, inviting wilderness. Read the text and you will learn about the 40 knot winds, the six gloves on each hand, the blizzards...

Together, you get the picture. It comes direct from Australians who love Antarctica enough to sail there in a 21 metre ketch and climb the highest mountain in the Admiralty Range.

Mt Minto is **The Loneliest Mountain.** *On the 4163m summit, the first humans ever to stand there had to cut the icicles from their eyebrows to photograph each other.*

The 11-strong group mainly had adventure in mind. Scientific interest centred on whale sightings by whale expert Peter Gill and rock samples collected by geologist and expedition leader Greg Mortimer.

They raised finance for the trip by selling the film rights to the Nine Network and the magazine rights to **Australian Geographic,** *and with donations from Sigma Data and private benefactor Alan Thistlethwaite.*

The book recounts the expedition in diary form. This allows the reader to share the human experience of the excitement and privations of the unique environment on the bottom of the globe.

Lincoln Hall's first book was **White Limbo,** *the story of the first Australian ascent of Mt Everest. Author Thomas Kenneally has described Hall's latest effort as 'one of the best and most engrossing accounts ever written about travel in Antarctica'.*

Photographer Jonathan Chester has gained a reputation as Australia's foremost expedition photographer. He also is an 'Antarctic addict', off there again this summer.

Their book is informative and entertaining, of interest to Antarctic and adventure buffs, environmentalists and anyone keen to discover more about the world without having to put on a parka.

Simon Grose

To order *The Loneliest Mountain*, send a cheque or money order made payable to Jonathan Chester Photography, or complete the credit card details below, and post to:

LONELIEST MOUNTAIN BOOK OFFER
GPO BOX 3362 SYDNEY NSW 2001

I have enclosed a: ☐ **Cheque** ☐ **Money order**
Please debit: ☐ **Bankcard** ☐ **Visa** ☐ **American Express**

Credit Card Number .....

Expiry Date ..... **Signature** .....

The cost of the book is $34.95, plus $5.00 postage and handling. **quantity** ..... **$**.....
An Antarctic Expedition poster is available for $7.00, plus $3.00 postage and handling. **quantity** ..... **$**.....
TOTAL **$**.....

Please post to:

NAME ..... **ADDRESS** .....

..... **POSTCODE** .....

CONTACT NUMBER .....

Australian DNA Bank goes international

The CSIRO DNA Bank for cattle — a unique world facility — has scored its first international 'borrower'.

The bank, part of an ambitious project to develop a genetic map of cattle, is operated by the molecular genetics group of the Division of Tropical Animal Production in Rockhampton.

Project Leader Dr Jay Hetzel said the consignment of cattle DNA to the Texas A&M University was part of an international collaborative effort to develop a primary gene map of cattle.

The gene map will be used to identify genes of prime interest to cattle breeders, such as those controlling meat quality and production, disease and parasite resistance and reproductive performance.

Since cattle, sheep, pigs and goats are biologically very similar 'under the skin', the mapping information will also benefit Australia's other livestock industries.

Dr Hetzel said the A&M University group was looking at particular sets of genes.

"By analysing our material they can quickly find out where the genes are located on the map. In return, users of the bank submit their data to our database," he said.

"This exercise in national and international co-operation promises to yield a detailed gene map within a matter of years."

Dr Hetzel said the bank now had DNA from 124 animals and was the only one of its type in the world. It was made possible through embryo transfer programs and the detailed herd information collected at the National Cattle Breeding Station, Belmont (just outside Rockhampton) and by other industry breeders.

The project has received financial support from the Australian Meat and Live-stock Research and Development Corporation.

Dr Hetzel said about one litre of blood was collected from each animal, out of which 500 million white blood cells were isolated.

"The pieces of DNA are tightly packed in each cell, but if unwound and joined up each animal's DNA would stretch for a million kilometres," he said.

He said despite this seemingly limitless supply of DNA his only real concern was actually running out of DNA.

"It is a big task to set up and maintain a DNA bank but the end result will make it much easier to isolate DNA markers, particularly for traits such as disease resistance and carcase quality, thus providing useful new technologies for animal breeders," he said.

Letters

(Cont. from p.2)

Dear Editor,

M J Jones (*CoResearch* October 1989) is clinging to the old fashioned obstructionist view of work based childcare.

Firstly, work based childcare for CSIRO staff will not cost the individual parent less each week in fees as weekly rates will be roughly the same as other childcare establishments. It will save CSIRO through improved productivity and staff morale, and reductions in absenteeism, staff turnover and tardiness.

These are the compelling economic arguments for work based childcare that have convinced the 4,000 American companies who now provide it (as compared with 105 in 1978).

It is commendable that CSIRO, which competes internationally for its staff, has been quick to notice the demographic and social changes that mean work based childcare must be a priority in the 1990s.

Greg Tanner
Division of Plant Industry

Dear Editor,

It was gratifying to read of Alister K Sharp's enthusiasm for staff development and training (letters to the Editor, *CoResearch*, October). However, he may have conveyed the impression to some readers that advertised courses have been cancelled because of mismanagement of funds. This impression is incorrect. The vast majority of courses listed in the *1989 Directory of Employee Development Programs* have been conducted or will be held by the end of this year.

It is true that requests for specific courses in particular Divisions have exceeded our capacity to fund in the current financial year and several advertised courses were cancelled because of low demand or changed priorities. However, we are committed to an enhanced level of staff development through corporate programs, the activities of Regional Employee Development Committees and programs organised by Institutes and Divisions. An interim Directory of Employee Development Programs for the first half of 1990 will be issued early in the new year and a full program for the 1990–91 financial year will be issued in mid 1990.

Bob Marshall
Employee Development Unit

Dr Solomon wins Ian Wark Medal

On Friday the 13th of October Dr David Solomon, Deputy Director of the Institute of Industrial Technologies, did very well for himself, but it had nothing to do with luck.

A protégé of Sir Ian Wark's, Dr Solomon was presented with the Ian Wark Medal for 1989 in the Ian Wark Laboratories at Clayton on that day. It was given in recognition of his important contributions to Australian prosperity through the advancement of scientific knowledge and its application.

One of Dr Solomon's main contributions marked by the award has been the development of the plastic banknote. The note is more difficult to forge than existing notes and lasts longer. It has gained world interest for Australian science.

Dr Solomon was formerly Chief of Chemicals and Polymers, a CSIRO Division that took off from work started by Sir Ian Wark.

Orientation time?

Japan, with a gross domestic product of $US23,000 per capita last year, is the world's richest country.

Under a new fellowship scheme some of that Japanese GDP is now available to fund research in Japan by overseas scientists.

Three representatives of the Japan Society for the Promotion of Science (JSPS) visited CSIRO Headquarters early in November to encourage CSIRO researchers to take part in the scheme.

Shigeru Torikai, Head of the JSPS Exchange of Persons Division, his assistant Toru Sato, and Takashi Otsuka of their Domestic Programme Division were promoting the JSPS Postdoctoral Fellowship for Foreign Researchers.

JSPS began in 1932 as a private foundation. In 1967 it became a semi-government body and part of the Ministry of Education, Science and Culture. JSPS has always sponsored interchange of scientific personnel — the new scheme was instituted in 1988 to: '...provide selected young foreign researchers with opportunities to pursue collaborative research with Japanese researchers...'

To qualify a candidate must

- **be an Australian citizen**
- **hold a doctorate**
- **be not more than 35 years of age when the fellowship commences**
- **have established research plans with Japanese host researchers.**

Fellowships are awarded for 12 months with provision for an extension of up to a further 12 months. Travel and housing costs, living and family allowances, language training and insurance, are all covered by the fellowship.

Australia is one of 12 countries recognised under the scheme. The Australian Academy of Science is the official nominating authority in this country.

For more information and application details contact Dr Ta-Yan Leong of CSIRO's Centre for International Research Cooperation (062) 48 4444).

Lasers for furnace control

CSIRO scientist helps BHP save millions of dollars and market new instruments

The heat, the dirt and the noise of a blast furnace are a far cry from the rather civilised and gracious surroundings of the Division of Atmospheric Research in Aspendale. Scientist Mr John Bennett took up the challenge to venture into unfamiliar territory for some pioneering laser instrumentation work 'in the field' – and the results have been more than worthwhile. Here he tells his story.

My 18-month secondment to BHP Central Research Laboratories in Newcastle came about through a request from an ex-CSIRO colleague, Dr Chris Scott. Chris is now a Principal Research Officer with BHP.

Chris and I were involved in the development of laser instrumentation at the Division of Atmospheric Research.

My role at BHP CRL has been to design and co-ordinate the development of 'laser time of flight' instrumentation for use on the company's blast furnaces.

Very basically, laser time of flight ranging involves measuring the time taken for a very short laser pulse, typically two to three nanoseconds, to travel to a target and return. Knowing the time of flight of the laser pulse, it is possible to calculate the distance to the target.

During my secondment, I have been closely involved with the development of three laser time of flight ranging systems – OPSTOCK, Burden Surface Profiler and RAIDM.

OPSTOCK and the Burden Surface Profiler have been installed on furnaces at Newcastle and Port Kembla to measure blast furnace burden distribution, burden descent rate and peripheral uniformity.

RAIDM has been installed on blast furnaces at Newcastle, Port Kembla and Whyalla to measure 'raceway depth' and coke particle size distribution.

With no previous knowledge of the steel making industry, I was totally unprepared for what was involved in developing equipment for reliable and economical operation in the blast furnace. The furnaces are huge, with the biggest about 12 storeys high and with an output of over 7,000 tonnes of iron a day.

Temperatures exceeding 800°C are regularly encountered right beside them.

The air is highly contaminated with very fine grained iron ore, sinter and coke particles that pervade everything. Not exactly the pristine environment in which laser projects are developed at Atmospheric Research.

Strict safety conditions must be followed because of the ever present risk of carbon monoxide poisoning or explosions. Before I started at CRL, a tuyere (water cooled nozzle) at the base of one of Port Kembla's furnaces had failed, which resulted in molten metal flowing uncontrolled from the furnace. Electrical wiring to the control room was destroyed and the furnace had to be brought under control manually.

In an iron making blast furnace, iron ore, coke and fluxes which comprise the burden, are charged at the furnace top. At the base, pre-heated air at about 800°C is blown into the burden material at high pressure through tuyeres, to form regions known as 'raceways'.

Here, coke combustion generates hot rising gases which 'reduce' the iron ore in the descending burden. At the centre of the furnace is an area called the 'cohesive zone' where the iron ore is fully 'reduced' and forms molten metal.

The temperature in this region is about 1,200°C.

At regular intervals, a 'tap hole' in the side of the furnace is opened and the molten iron is drained off in rail rolling stock called Tredwells. Each Tredwell holds 200-220 tonnes and the metal remains liquid within them for several hours. During this time, it is transported to the Basic Oxygen Steel (BOS) making plant where it is converted into steel through the addition of oxygen and other elements.

For stable furnace operation, as well as avoiding damage to the furnace refractory wall, the hot gas blast from the tuyeres must be confined to the centre of the furnace and away from the wall.

Theoretically, this can be achieved only by maintaining optimum burden distribution, descent rate and peripheral uniformity within the furnace. Until recently, control of these parameters had not been possible.

The development of OPSTOCK, Burden Surface Profiler and RAIDM has changed this.

During normal furnace operation, the burden position or stockline historically has been measured at one or two fixed locations using a mechanical stock rod (a heavy weight on the end of a length of steel wire).

Consequently, this single point measurement has not been suitable for making fast three dimensional measurements of burden distribution or monitoring peripheral burden uniformity.

This situation has now been addressed using the three instruments mentioned above. Each is based on the concept of a short laser pulse being fired at a target, such as the burden surface. The time between transmission of the pulse and its arrival back at the laser is a measure of the distance to the target.

OPSTOCK is an electronic equivalent of the mechanical stock rod. This rod is very similar in principle to the oil dip stick on a car. A weight at the end of a cable is lowered into the blast furnace (burden surface). The length of the cable, and hence the depth of the burden, is recorded.

A laser pulse is fired at the burden surface and the time for the pulse's return journey is recorded. Knowing the time taken, it is then possible to calculate the distance to the burden surface.

Although still only able to make a single point measurement, OPSTOCK is capable of making faster measurements over a longer range than its mechanical counterpart.

In addition, it is able to make measurements during charging of the furnace, when the mechanical stock rod must be withdrawn.

Used in combination with the latter, it has proved invaluable during periods of mechanical rod failure, and during these times it recovered its development costs.

On two occasions, blast furnace operations were maintained while the mechanical stock rod was repaired. Had it been necessary to shut the furnace down, production losses of over $300,000 would have occurred. Since then, savings in production losses have exceeded $1 million.

The Burden Surface Profiler is an extension of OPSTOCK. While OPSTOCK only makes a single point measurement of the burden surface, the Burden Surface Profiler scans the surface with a pulsed laser to produce a three dimensional picture of the burden distribution.

It also incorporates a radiometer that produces three dimensional burden temperature profiles showing the distribution of hot gas flow and hence burden volume distribution in the furnace.

RAIDM is similar to OPSTOCK, though instead of measuring burden height it measures the depth of penetration of the hot air blast (raceway) from the tuyeres into the burden material.

The laser and its associated control system are located remotely and the laser pulse is transmitted to the tuyere boot cap and received via fibre optics.

RAIDM also measures raceway brightness and includes a CCD camera for visual monitoring of the tuyere and raceway zone, as well as providing near-frozen video images of coke particles circulating in the raceway zone.

The size of the coke particles is indicative of hot gas flow through the burden.

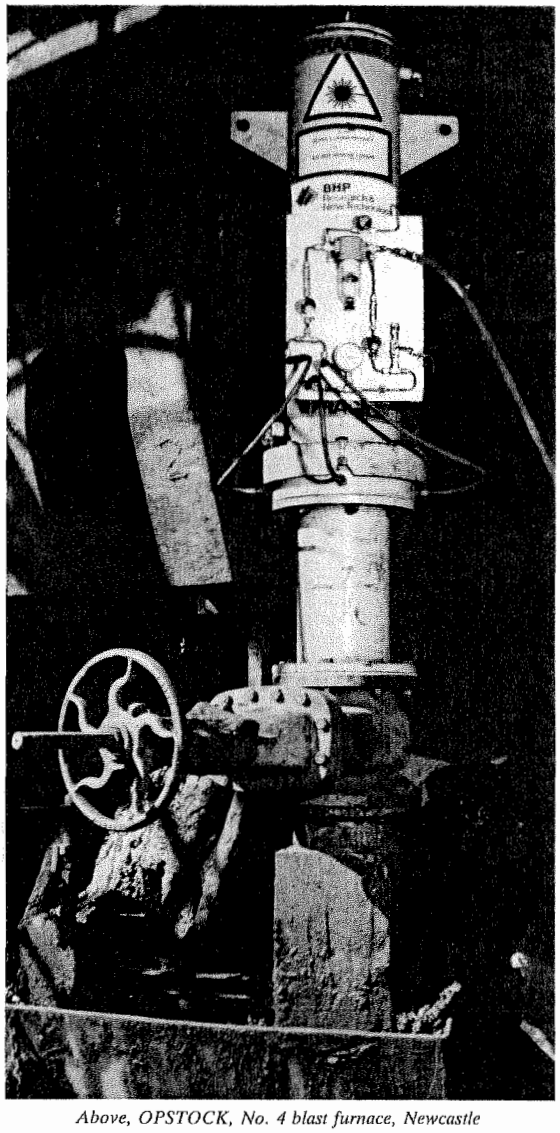
Testing of a single unit RAIDM has been successfully concluded and a multiple laser system is being developed for near simultaneous measurement at four equally spaced tuyeres around a furnace.

These instruments are generating considerable excitement at BHP, not only from the point of view of increased blast furnace performance, but also because of the income they may generate through overseas sales.

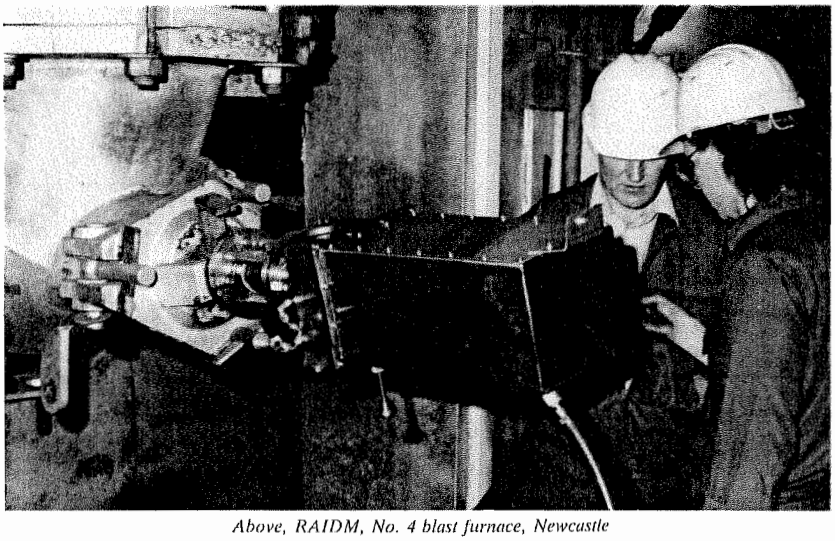
Individual development costs for the instruments were over $300,000.

Another division of BHP, BHP Instruments, will be producing them and at present is actively marketing them overseas.

It has been a great experience to have been involved in the development of instruments that will enable Australia to maintain its lead over the rest of the world in iron making technology.



Above, OPSTOCK, No. 4 blast furnace, Newcastle



Above, RAIDM, No. 4 blast furnace, Newcastle

Obituary Obituary Phillip Garritty Killed in Crash

Young scientist killed in crash

The tragic death of Philip Garritty in a two-car accident near Tenterfield in northern New South Wales on 28 October 1989 prematurely ended a career that had already contributed significantly to the Australian mining industry, and it deprived the Division of Geomechanics of one of its most innovative and promising scientists.

Born in the village of Ackworth in the county of Yorkshire, England, on 16 July 1956, Phil graduated from the University of Newcastle Upon Tyne. His BSc in Civil Engineering was followed by a PhD in Mining Engineering, majoring in rock mechanics.

He was a Research Associate at the University, and then lectured at the Department of Civil Engineering, Sunderland Polytechnic. He then became a Senior Geotechnical Engineer for a consulting firm, and specialised in the study of the stability of clay embankments and in underground coal mining in Brisbane.

From the start it was obvious that Geomechanics had obtained the services of an outstanding and dedicated scientist.

In the tragically short time allocated to him, Phil achieved enviable results, as the scope and diversity of his project work testify. These reflect the breadth of his interest, his drive, and his initiative. He built up facilities and staff, based largely on industry funds.

He developed a system for the surface monitoring of underground mining conditions that increases both the safety of mining workers and the production capability of the mine. This provides routine, real-time data acquisition on the surface, and has created considerable industrial interest, with subsequent installation in collieries.

He initiated the first large-scale use of ultra-light-weight concrete for cavity stabilisation in Australia, and was able to pinpoint reasons for the poor performance of tunnelling machines in Australian situations and to suggest ways of increasing their effectiveness.

He successfully commissioned a new base friction modelling machine and developed techniques for modelling coal mine roofs that can be applied to other uses.

Phil was involved in eight collaborative research projects, and supervised the NERDDC Roof Alert Project. He played an important part in a further successful NERDDC project in Coal Mine Design and was prominent in many CSIRO–University Collaborative Projects.

In addition, he published five papers in international refereed journals, and authored numerous CSIRO publications.

He was a Member of the Chartered Engineers, a Member of the Institute of Mining and Metallurgy, an Associate Member of the Institute of Civil Engineers and the CSIRO representative on a New South Wales Department of Mineral Resources committee on subsidence research.

Phil was an ebullient, self-confident Yorkshireman with a wonderfully wicked sense of humour. In him, boldness and brashness were accompanied by a strong sense of fair play and an absolute dedication to the achievement of objectives.

He successfully blended scientific theory with practical ability, and this enabled him to bring together industry and research requirements in a most effective way.

His drive, initiative and outstanding ability will be sorely missed. To his family and friends we offer our sincere sympathy.

Alan Scott and **Cliff Mallett**
Geomechanics, Brisbane
13 November 1989

Student Research Scheme

The presentation evening for the 1989 CSIRO Student Research Scheme was held in Canberra last month. Fifty local Year 12 students took part in the Scheme, undertaking research projects in a range of fields including environmental mechanics, laser physics, earthquake seismology and blowfly genetics. Donna Hajek, pictured above, undertook a project with Dr Kevin McCue of the Earthquake Seismological Centre, Bureau of Mineral Resources.

A new mountain (of old papers) for Colin to conquer

Mr Colin Smith, CSIRO's archivist since 14 November, 1978, has resigned to take charge of the archive of the Royal Australasian College of Surgeons in Melbourne. He leaves behind him an archive of considerable fame amongst historians. For example...

It is now two years since Professor Boris Schedvin completed the two-kilogram initial volume of what will be the first comprehensive history of the CSIRO — *Shaping Science and Industry: A History of Australia's Council for Scientific and Industrial Research 1926–1949.*

The research took him eleven years.

At the book's launch Professor Schedvin gave much of the credit for making that research possible to Colin Smith.

He said that Mr Smith, virtually singlehandedly and in the face of considerable odds, had established and built up the CSIRO archive, ensuring the preservation of vital and irreplaceable records of science in CSIRO.

Mr Smith doesn't blush at the praise heaped on his archive; in fact he heaps it higher. But he lowers a critical eyebrow at 'singlehandedly'.

Credit for the acknowledged excellence of the CSIRO archive, he says, is shared by 'about 20 people, who cared'.

He wrote a farewell letter to that select little group just before he left, and, though he didn't give their names, he did give permission to print part of the letter itself. Here it is.

###

'... With the help of people like yourself, the CSIRO Archive has been able to secure and document — relatively safe, retrievable and available — the greatest single accumulation of twentieth century records of Australian science and technology.

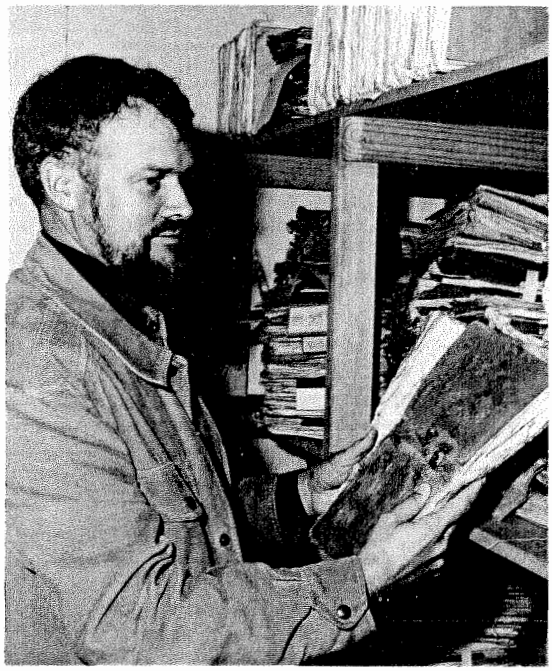
'Had this not been done, many of these records would no longer exist. Because it has been done, we have become a major source of evidence and information for a growing number of researchers in the history of Australian science and technology, and in related fields. The reference service we provide has been widely praised.

'I should also mention that, in two divisions, honorary archivists have been building in-house collections and providing reference service. These people deserve a special thank-you for their efforts, which have reduced the impossible demands on our central service. [The people referred to are Sally Atkinson, of Radiophysics, and John Spink, of Chemicals and Polymers. — Ed.]

'Between us, we have given CSIRO some grounds to claim that it is observing the *Archives Act* in its spirit as well as its letter. Indeed, we have done at least as well as many departments that are deploying, proportionately, far more resources.

'It has been a privilege and an education for me to work with the records of CSIRO. It has, in particular, engendered in me a profound respect for those brilliant, unpretentious, hard-working enthusiasts — the scientists. I hope I have done something to assist the development of a greater awareness of, and interest in, the story of their work.

'It is hard to think of much about modern Australia that does not reflect the impact of the research and creativity of our scientists and technologists. When this fact is fully realised, the holdings of the CSIRO archive will come into their own. They will be widely recognised, at last, as a precious resource of irreplaceable evidence and information about a major facet of Australian life and culture.'



Above, Colin Smith brings order out of chaos at Yarra Bank in 1981.

###

Tom Denmead receives international honour

Dr Tom Denmead of the Centre for Environmental Mechanics in Canberra has been honoured by the American Society of Agronomy.

He was installed as a Fellow of the Society at its annual meeting in Las Vegas in October.

Colleagues in the Society make nominations based on professional achievement and meritorious service. Only 0.3 per cent of members of the Society may be elected Fellows.

Dr Denmead is a senior principal research scientist at Environmental Mechanics, where he leads the physical ecology program. He holds degrees from the University of Queensland and Iowa State University.

His research on physical aspects of plant ecology and on the biogeochemistry of ammonia and nitrous oxide has earned him world eminence.

Dr Denmead was an Underwood Fellow of the British Agricultural Research Council, Letcombe Laboratory, in 1984 and has served on several committees of the Australian Academy of Science.

Above, Dr Tom Denmead

Recently he was elected Fellow of the Australian Academy of Technological Sciences and Engineering.

CoResearch **is produced by the Public Affairs Unit for CSIRO staff and interested outsiders. Readers are encouraged to contribute or offer suggestions for articles. Stories may be reproduced, provided acknowledgement is given to both *CoResearch* and CSIRO. The deadline for contributions is the last Monday before the issue month. Editor Liz MacKay, PO Box 225, Dickson ACT 2602. PH: 062-48 4567. FAX: 062-48 4641.**

330##1990

CoResearch

No. 330 February – March 1990 CSIRO's staff newspaper

CSIRO AUSTRALIA

Government set to adopt CSIRO reforestation plan

The ambitious reforestation program proposed last year by Richard Eckersley, CSIRO's Principal Issue Analyst, in his high-profile occasional paper 'Regreening Australia' looks like being taken on board by the Federal Government.

At least, it will be if they accept the recommendation of their Standing Committee on Environment, Recreation, and the Arts in its most recent report, *The Effectiveness of Land Degradation Policies and Programs.*

The report, issued at the end of last year, says 'The Committee believes that Mr Eckersley's proposal contains the breadth and depth of vision necessary to provide solutions to Australia's land degradation problems, and therefore considers that a serious effort should be made to bring this plan into being. The One Billion Trees Program could be the springboard to achieving this, and the Committee recommends that the Commonwealth convene a reforestation working group to evaluate the CSIRO paper on regreening Australia and to identify ways in which the reforestation program proposed in the paper can be implemented.'

Eckersley admits that there are problems with the proposal. It would be expensive, and many of its possible benefits remain unproved. But he believes the seriousness of the situation warrants some such program, and that his offers not only environmental but also economic and social benefits.

The primary objective of the program would be to halt and reverse land degradation, but it could also absorb some of the carbon dioxide emitted by the burning of fossil fuels in Australia. While Mr Eckersley grants that this would be 'of little global significance' he feels it is important that Australia be seen to do its share in the fight against the greenhouse effect.

The plan should also increase agricultural productivity 'by providing shelter and fodder for stock, reducing water loss from crops, supplying nutrients, and increasing bird life, which reduces insect pests.'

Jobs should also be generated, timber production boosted, and the beauty of the bush enhanced; but there are some benefits less easy to quantify.

Mr Eckersley says, in his summary of Regreening Australia:

'One of the potentially most important benefits of large-scale revegetation is also the least tangible – in being large-scale, conceptually simple, highly visible, genuinely national in scope, and offering a broad range of environmental, economic and social benefits, the program could become a key to creating a vision of an Australia that is vigorous and enterprising and, at the same time, far-sighted, fair and decent. The program would help to engender among Australians the sense that we are capable of tackling the daunting long-term problems that confront us, and so determining our own national destiny. If it achieved this, it would help to overcome the growing disillusionment and cynicism with which Australians regard politics, and the dismay with which many view the future.'❖

Posthumous honour for Ming Leung

Chief of the Division of Coal Technology, Professor Ming Leung, whose obituary appears on page 12, is one of four new Honorary Fellows of the Institute of Engineers Australia, elected for their 'conspicuous service to the profession, or eminence in engineering or kindred sciences'.

The latest edition of *Engineers Australia* calls him 'one of the most outstanding leaders of the chemical engineering profession in Australia' and a 'recognised world authority' in the field of multiphase flow.

At the time of his death Professor Leung was not only Chief of his Division, but a director of four companies: Auscoal Joint Venture; CPC Joint Venture, Aquaterre Pty Ltd; and ACIRL.

New boss, but no new broom, for the 'best brains in Australia'

'I won't be coming in like a new broom, sweeping aside an old structure' says Dr John Stocker, the newly appointed Chief Executive of CSIRO, 'I think the structure you have is excellent. In that area, I won't be moving and shaking at all.'

Well, what areas will he be moving and shaking in? He doesn't look the type to stand still for long.

John Stocker sees his biggest battle as making sure there's enough funding to maintain optimal effort.

He also wants to increase our influence, 'sharply', at all levels in the community.

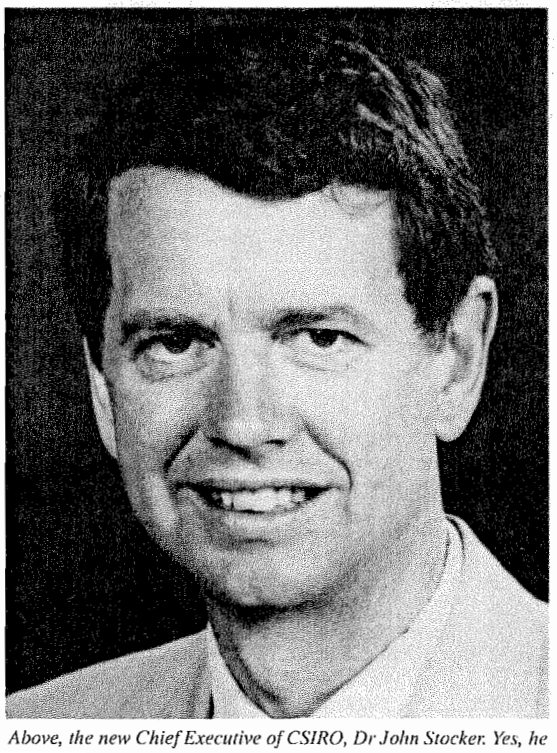
Not only does he regard his new position as 'the most important job in Australia': he regards his staff as the most important body of workers. 'The Organisation' he says 'contains many of the best brains in the country. Australia's future is very uncertain, but we have the raw intellectual material here in CSIRO to do something about it, to lift the economic game of this country.'

Stocker is a great believer in talent, and adamant that it must not go unrewarded. He'll be working at making sure it doesn't.

'Unusually good contributions do shine out' he says. 'It's up to the Chief Executive to look for them, and to make sure the people who work with him, or her, are talent-spotters. Wherever talent exists in the Organisation it ought to be recognised, and that means rewarded.'

John Stocker thinks the single most important thing he has to offer CSIRO is his enthusiasm. 'I'm keen.' he says simply, and he certainly seems that way. Perhaps genuine enthusiasm, like other unusually good contributions, really does shine out.❖

(John Stocker brings more to the job than keenness however: for a bit more detail turn to p.5.)



Above, the new Chief Executive of CSIRO, Dr John Stocker. Yes, he is as young as he looks; forty-four, but rising.

John Stocker

Australia Day 1990 Order of Australia honours for CSIRO staff

AM - Members in General Division

Dr Neville Fletcher, former Director of the Institute of Physical Sciences – for service to science, particularly in the field of applied physics.

Dr Hari Sinha, Division of Mineral Products – for service to science and technology and to Australian-Indian relations.

Dr David Solomon, Deputy Director, Institute of Industrial Technologies – for service to science and technology, particularly in the field of polymer chemistry.

OAM -. Medal in General Division

Mr Tony Culnane, formerly of Personnel Branch, CSIRO Headquarters – for service to the community.

AC - Companion in General Division

Mr S.B. (Bails) Myer, former member of CSIRO Executive – for service to business and commerce, to government and to the community.

From the Chief Executive

A column by Dr Keith Boardman

On January 15 I gave the address at the opening forum of the second session of the National Science Summer School at the University of Canberra. The School, which brings together top science students from Year 11 across Australia, together with a small number from overseas, has as a major aim the direction of top students into creative careers in science and technology.

The sponsor for the 1990 School is CRA, and Rotary Clubs throughout Australia play an important role in selecting students and providing financial assistance. The students are shown modern developments in science and technology in a way that will assist them to select careers in science and technology. Discussion sessions, which offer the opportunity for lively debate among the students, are a feature of the National Summer Science Schools.

I opened my address by telling the students that they owe it to themselves to critically ask two main questions: 'what?' and 'why?'. What area of science to specialise in, and why choose science? Although students are often attracted to particular areas for personal reasons of interest and experience – perhaps the influence of an outstanding teacher – I stressed that there are reasons external to their personal experience which are important. New areas of science and technology are emerging which could offer the most interest, the greatest challenge or the best rewards in the early part of the next century. Areas I chose for illustration were molecular biology and its applications in biotechnology, new materials, information technology, and technologies to preserve and enhance our environment.

Persuading the top science students in the Summer School to choose science provided a challenge for me in view of the renewed publicity in the media in the last few weeks of the poor support for science and technology in Australia. I argued that the demand for scientists and technologists must increase for a strengthened and more developed Australian economy. The nation and companies will have to invest greater amounts in research and development to keep pace with their competitors. This increase in demand will be occurring at the time when the supply of highly qualified and experienced scientists and technologists is falling. Market considerations of supply and demand will push up the financial rewards for scientists.

Of course, I emphasised the other rewards and incentives of a science career: the excitement of being involved in a truly creative and intellectually demanding process of discovery; membership of the international fraternity of science; travel and the potential for international recognition of one's work; and the satisfaction of doing socially valuable work. I had the opportunity to meet several of the students at the morning tea break. It was very encouraging that the questions from the students related to the exciting areas of science and technology, and not at all to the monetary rewards for scientists. Perhaps this is a reflection of the type of students selected for the Summer School.

At its December meeting the CSIRO Board supported my proposals for enhancing CSIRO's role in science education and encouraging students into science at tertiary level and postgraduate and postdoctoral research. My paper to the Board proposed increased financial support from CSIRO not only at postdoctoral and postgraduate, but also at undergraduate level in specific areas. The Board agreed that a more detailed paper be prepared with an indicative budget for implementing an effective program.

Science, technology and mathematics in schools have been selected for discussion at the next meeting of the Prime Minister's Science Council.

A Keith Boardman

Letters to the Editor

Dear Editor,
'Their duties run the gamut from secretarial to full responsibility for pensions, treasury operations and insurance, as well as the complete consolidation of the organisation's accounts'. This statement from the financial pages of *The Australian* could almost be describing our corporate centre. It isn't.

Several contributors to this column have agreed with Liz Tynan that communication and understanding between the CC and Divisions would be improved if CC staff spent a week per year working with the research teams. In December's issue John Vercoe goes further and suggests that stints of 6-12 months are needed to achieve a result.

I'd like to point out to Liz and John that all such fixed terms are now an anachronism in the Organisation; the CC staff should be placed in Divisions on an 'indefinite' basis. Of course, if there is insufficient work, the relocated CC staff, like the rest of us, could be outplaced under our new 'redundancy' provisions.

How much of CC should be distributed to Divisions? Well, my quote at the beginning of this letter refers to the head office staff of BTR Australia, which is the nation's second-largest company, with world-wide sales of $3 billion and a market capitalisation of $8 billion. And how many staff are in their headquarters, including the Managing Director? 19. It's not that we don't want you, CC. We want you here in the Divisions, permanently. Oops, indefinitely.

F.J. Ballard
Assistant Chief
Division of Human Nutrition

Dear Editor,
At last someone has brought up the problems associated with the employment of over-qualified staff for technical positions. Thank you Vaughn Cox of Floreat Park.

The recurring practice of employing science graduates as technical staff is totally inefficient, other than to Divisional finances. It affects the morale of technical staff and is a disruption to the career aspirations of those people who have studied for a certificate or associate diploma. How can any person who has studied for a degree be content with employment as a technical assistant? Surely they aspired to greater heights when they began their science degrees. No wonder we find ourselves in the position in this country where tertiary establishments have difficulty in filling their science student quotas.

What we are ending up with is an organisation which is bottom-heavy with science graduates who are unhappy with their lot, while people who are specially trained as technicians cannot get a foot in the door. Technical positions should be filled by technicians, not science graduates.

This continual disruption and inhibition of career progression for technical staff is uncalled-for and unwarranted by those Divisions that continue this practice.

Grant Johnson
Division of Food Processing

Dear Editor,
M.H.Jones in his/her letter to the editor (*CoResearch* 328) misses the point! Surely, it is CSIRO management that is joking!

The non-existent child-care facility at North Ryde has been touted as a showpiece of what CSIRO is doing in the EEO/human resources area. It was at a local meeting on EEO issues that I heard wondrous tales about the North Ryde child care facility. It seems some people believe the facility exists!

Further, it is not a matter of – and I quote from M.H. Jones – 'If I doesn't ask I'll never get' CSIRO has been waving the banner regarding this child care facility for years (if M.H. Jones would care to read my earlier letter). It has even been rumoured that the money has been set aside for it.

What I, and many others, would like to know is
1.Has the child care facility idea been scrapped?
2.Was or is any money allocated for its construction or running?
3.Is there a real problem in locating a site for the facility?
4.If the answer to Q.1 is 'no', when are we likely to see a child care facility in operation?

Could somebody in the Human Resources Branch or elsewhere in CSIRO please enlighten us, preferably in the pages of *CoResearch*.

Helmut Panhuber
Division of Wool Technology

Dear Editor,
I refer to the letter from R.W. Sutherst, Division of Entomology, in the December 1989 edition of *CoResearch*.

He gives a personal viewpoint without paying the staff in the Corporate Centre the courtesy of even a telephone call or letter to check his facts.

The Corporate Centre does go through the same budget bidding process as the Institutes and a number of the areas work on the user-pays principle, and there are people without personal computers who could well use them.

Finally, I would like to invite Dr Sutherst to closely examine the software he is commenting on before criticising it. He may get a pleasant surprise!

P.H. Langhorne
Corporate Centre

The following was sent as a personal letter to Liz Tynan, the former editor of CoResearch, but with this postscript: 'You are welcome to put this into CoResearch *if you think it'll stir them up a bit'.*

Dear Liz,
The other day I called in at the Cunningham Labs in Brisbane more or less to reassure myself that CSIRO was still there, and collected some back copies of your worthy publication. In issue No. 327 (September 1989) I saw your article in A Matter of Opinion, concerning the state of communication between staff at HQ and staff at Divisions. Your suggestion (I realize you don't claim it as your own alone) was supposed to have been acted on some time in the mid-seventies: a scheme had been proposed whereby selected people were to be seconded to HQ from Divisions and vice versa, for one to three months, I think. I was one of those who volunteered to spend time in Canberra, my job at the time being Technical Secretary at Food Research, North Ryde. From memory – never the best, I fear – someone at HQ wrote to me two or three times to apologize for the delay and reassure me that the exchange would take place 'soon'. It never did and the matter was dropped. I do believe, however, that a PRS from Textile Physics spent some months at Limestone Avenue, to what effect I know not.

I don't know that this helps, but it reinforces the notion that new ideas are few and far between. It's putting them into effect that stymies us. (I read recently of newly published work done in the U.S. on some aspects of food irradiation that we were familiar with a good fifteen years ago!).

Best wishes and keep up the good work.

George Fisher

A Matter of Opinion

This month's 'opinion' comes from Bill Godbeer and Ken Riley of the Division of Coal Technology at North Ryde.

So, one of the aims of the Officers Association is to attract young people to careers in science, technology and engineering (*CoResearch*, December 1989). Have young people been asked why they are not interested in science as a career?

There can be no doubt that there are certain rewards in working in 'Science', particularly research; however, these are not financial. It seems that intelligent youth have concluded that Australian society (Government) does not have a need for people trained as technicians and scientists, for if there was a need, there would be many opportunities and the financial reward would be commensurate with this need and in line with average weekly earnings.

Salaries paid in CSIRO could be used to indicate Australia's requirement for individuals educated in science. Let us look at the trend over the last five years.

	Salaries		
	1984	1989	% increase
STO 2M	$28,647	$34,850	21.6
ES 3M	$32,583	$40,127	23.2
PRS M	$43,941	$53,621	22.0

(STO = Senior Technical Officer; ES = Experimental Scientist; PRS = Principal Research Scientist; M = maximum.)

In this same period the CPI index has increased by 45.6% and average weekly earnings by 44%. Does this not indicate that society has in some way determined that scientists and technicians (at least in CSIRO) are less needed (valued) than they previously were? Although many are the criticisms of our schools, nobody has yet seriously proposed that school leavers are naive. Sadly, many have apparently decided that science is not worth studying.

Although school leavers may not be naive, there is some evidence to suggest that many in CSIRO and the Associations that represent them are. Is anybody aware of what has happened to superannuation pensions in the same five years? Let us look at pensions. In this table the annual pensions of retirees (on the same grade) who retired at age 65 in 1984 and 1989 are compared.

	Present pensions	
Retirement date:	1984	1989
STO 2M	$20,855	$17,425
ES 3M	$23,720	$20,064
PRS M	$31,989	$26,811

The anomaly is evident. A ridiculous situation has occurred. For example an Experimental Scientist, 3M, 60 years old in 1984, working with a Senior Technical Officer 2M who retired in that year at 65 years of age would now have a pension less than that of the person he or she supervised! Indeed, anybody who had retired in 1984 at 60 years of age would now be receiving a greater pension than if they had stayed on to the age of 65.

It is obvious that the Accord has caused these anomalies, but what is not so obvious is why we and our Associations have allowed ourselves and our work to be devalued. It is now at the stage where experienced, well-trained people are reluctant to work with CSIRO, and brighter school leavers are not interested in a career in science.❖

World leaders of public sector science gather at CSIRO headquarters

Heads of government research organisations from all over the world gathered at the CSIRO corporate centre in Canberra in December to discuss major research and management issues.

Left to right: back row, Mr Merchant, Dr Ellis, Mr de Jong, Mr Johry, Dr Lake; middle row, Dr Sugiura, interpreter, Dr Johansen, interpreter, Dr Pottie, Mr Forsten, Dr Suzuki.; front row, Dr Carter, Dr Mitra, Dr Boardman, Dr Coleno. Photo by Julie Faulkner.

To ensure that discussions and disclosures would be entirely frank, participation was restricted to these invited public sector science leaders, but senior institute and corporate centre staff were invited to sessions of particular interest to them.

Almost all of the organisations have, like CSIRO, been involved in major changes in structure and direction in recent times, so the meeting offered a rare opportunity to exchange ideas and experiences.

The three days were divided into ten sessions, each led off by speakers from two or three countries and then thrown open to general discussion, yielding some lively and protracted exchanges on

the role of government R&D organisations
funding of R&D
priority-setting and resource allocation
management of R&D and the balance between long-term and tactical research
exploitation of research
management of research personnel
management of financial aspects of research
publicising the benefits of research and international collaboration.

Dr Boardman hosted the meeting, which brought together the chiefs of research bodies from twelve countries –

Canada: Dr R.F. Pottie, Executive Vice President, NRC (National Research Council)
Finland: Mr C.J. Forsten, Deputy Director General, VIT (Technical Research Centre of Finland)
France: Dr A. Coleno, Head, Plant Production Division, INRA (National Institute for Agronomic Research)
India: Dr A.P. Mitra, Director General, CSIR (Council of Scientific and Industrial Research), and Mr K.N. Johry, Head, International Scientific Collaboration, CSIR
Japan: Dr M. Sugiura, Director General, AIST (Agency of Industrial Science and Technology), and Dr T. Suzuki, Director General, Fermentation Research Institute, AIST
Korea: Dr S.S. Lee, President, KAIST (Korea Advanced Institute of Science and Technology)
Netherlands: Mr W.A. de Jong, President, TNO (Netherlands Organisation for Applied Scientific Research)
New Zealand: Dr A.J. Ellis, Director General, DSIR (Department of Scientific and Industrial Research), and Mr M.A. Collins, Director General Elect, DSIR
Norway: Dr I. Johansen, Managing Director, NTNF (Royal Norwegian Council for Scientific and Industrial Research)
UK: Dr J. Lake, Head, Science Division, AFRC (Agricultural and Food Research Council), and Mr J. Merchant, Director, Council Policy and Administration, SERC (Science and Engineering Research Council)
USA: Dr Mary E. Carter, Associate Administrator, Agricultural Research Service, US Department of Agriculture, and
Australia: Dr N.K .Boardman, Chief Executive, CSIRO.

Senator Button hosted a dinner for the participants at Parliament House, and a reception was held at the Australian National Gallery for the group and staff from the embassies. Some leading members of the Australian scientific community were invited to these and other social functions associated with the meeting.

A record of the meeting is in preparation and will be made available within CSIRO.❖

Above, the first of the international participants arrive at the conference. Photo by Brian Gosnell.

Pelican's point

Pelican: omnivore ... elegant bird of air and sea ... flies very high ... sees all things in perspective ... big mouth ...

From The Agenda to the Big Enda

'Getting science and technology onto the political agenda' has been a major goal for the leaders of Australia's science community over the last two years.

And they have succeeded. Last year's May Statement was a major result. Media treatment of the S&T funding debate has been burbling along nicely. Now comes the hard part: translating that spot on the agenda into real policy initiatives from the major parties.

The political response so far has been reactive and unconcerted. This was highlighted early in the new year when Shadow Science Minister, Peter McGauran, said any increased funding to CSIRO under a Coalition government would come at the expense of 'unnecessary' research being conducted by universities.

Mr McGauran was soon set upon by aggravated academics and vengeful Vice-Chancellors. When he finally regathered his rent garments and crawled away, he may have reflected on the limited options available to a science minister when the nation has a very poor private sector contribution to S&T and the government is intent on budgetary restraint.

It is easy - as McGauran has found - to launch swingeing critiques at the present government's S&T policies, predicting dire consequences if they retain office. This is the conventional sport of Opposition. The conventional result is an occasional change of government - and no improvement in policy or management.

This inexorable ritual/charade is a cultural 'given'. It earns politicians a bad name. And it will happen to Science.

The current election campaign is the best and last chance (for a while) to influence this game. In the frenzy of election mode politicians often lower their guard and adopt new policies. These are mostly populist sops and pork-barrel scrapings dressed up as leg ham. But there are limited precedents for worthwhile policies being adopted in the process.

Of course, once the Treasury benches are secured any guarantees these policies will be adopted become as substantial as protons in the solar wind. But once 'on the agenda', committed single-interest groups can wheedle and push to get them up.

But what will wash?

Direct promises of more money? Not very likely. Only ask for small, one-off amounts linked to another issue (best chance: environment).

Direct promises of a long-term rise in public science funding? Difficult, but gets more attractive the more they look at it. Gives the impression they are long-term planners confident of holding office for some years. Costs less each year as revenues rise. Can be jettisoned if times get tough and lobby group drops off the pace.

Visionary goals/solemn pledges? Quasi-mystical upgrade of previous option. Especially attractive if it can avoid direct promises of immediate funding boosts. Examples? The CSIROOA have called for a doubling of R&D funding over five years. Perhaps so ambitious as to be unbelievable from a politician's mouth. Barry Jones has a stated aim of two per cent of GDP by the year 2000 - almost a doubling in ten years. Now if Bob or Andrew could make that kind of pledge ... and force the other one to match him ...

Carrots and sticks? Offering business more tax breaks and soft supports for R&D investment turns the 'rational' economists against you and rouses bleeding heart groups into choruses of 'What about me?'. Popular with business though. Promising levies on business to fund R&D turns the rational economists and business against you. Also rouses bleeding heart groups into choruses of 'What about me?' (They want a share of the proceeds.) Both definitely non-election-period items. Steer clear.

The scene is set. The CSIROOA's campaign in marginal seats has sharpened the focus. Now is the time for adding value to the rude ore, for processing the shapeless energy of public concern and media momentum into products of value.

They should be found embedded in the policy speeches. Then the success of 'getting science on the agenda' can be judged.❖

What? Humans at Headquarters?

Remember ex-CoResearch editor Liz Tynan's idea for breaking down the barrier of resentment between corporate centre and the divisions? She proposed that corporate centre people should spend time working in the divisions. And remember the positive response that idea got from at least one corporate decentraliser – Wendy Parsons of the Institute of Natural Resources and Energy?

Well, maybe it's not all words. The item below is reprinted from Bark, the newsletter of the Division of Forestry and Forest Products.

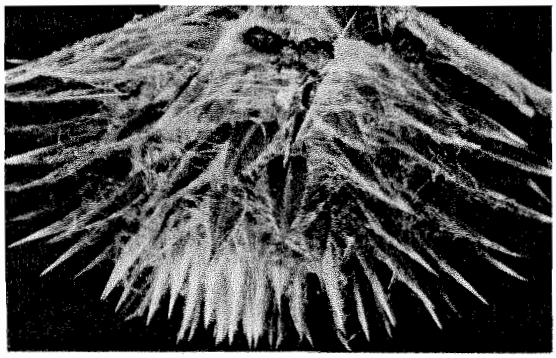
Head office 'Division be in it' scheme

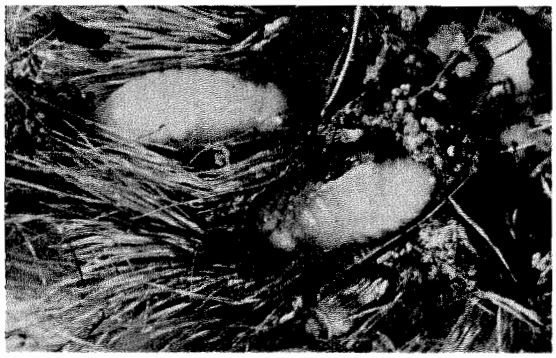
Through the good offices of ex-forester Wendy Parsons, the Canberra chapter of the native forest management programme availed itself of one of the more imaginative schemes to be hatched by the much-maligned Corporate Centre. The scheme enables admin staff to sample research activities around the Divisions, mingle with the troops and add a few faces to the names and statistics that are part of the paper war.

For the first clear week after the New Year break, a time when extra help for field work is as rare as hen's teeth, Steve Fitzgerald quitted his desk in the auditing section at Limestone Ave, donned hard hat and overalls and joined a DFFP crew at the Cabbage Tree site in East Gippsland. Steve helped out in a number of roles, clearing blocked roads, data recording, measuring trees, and best of all, carrying out sacks of stem sections from felled trees to the truck for transport back to Canberra. The weather gave us the usual mix of soakings and sweltering heat (30 degrees Celsius and above), and the bush provided mozzies, ticks, chest-high scrub, and the odd widow-maker.

Compensations were new friends, good food. an evening beer or three at the Bemm River Pub and a hands-on feel for forestry issues and research in one of the most important forested areas in the south-east of Australia. For the rest of the crew I can say that we enjoyed having Steve along. He was a tremendous help. We are off again at the end of February, Steve!!! Are there any more at Limestone Ave. like you?

Ken Old





Above, top, a cluster of Rhinocyllus conicus eggs laid on a flower bud of nodding thistle Carduus nutans. The bottom photo shows two of the hatched pupae and some of the damage they have done to the flowering thistle head. (See Entomology story opposite.)

BHP and CSIRO sign major strategic research agreement

Chief Executive of BHP, Mr Brian Loton, and Dr Colin Adam, Director of the Institute of Industrial Technologies, signed a five-year research agreement at BHP's Melbourne head office on 12 February. Dr Adam was representing Chief Executive Dr Keith Boardman, who was unable to attend the ceremony.

The Memorandum of Understanding commits BHP to invest in CSIRO research in the areas of waste management, remote sensing, and gas conversion. CSIRO will contribute resources and funds to augment BHP's investment.

In a written statement, Dr Boardman said that BHP and CSIRO expect aggregate spending on research to approach $10million over the five-year period.

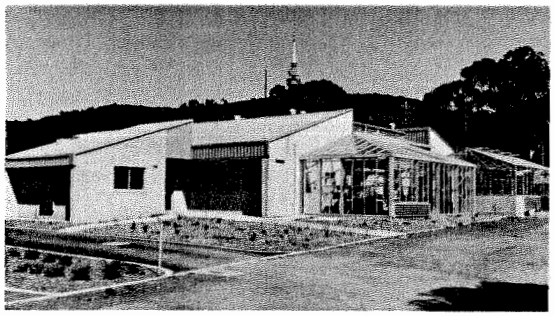
'This will occur as research enables the partners to identify specific areas of technological and commercial opportunity and put greater resources into their development.'

Welcoming the agreement, which came in the final month of his term as Chief Executive, Dr Boardman said it was a significant milestone in the development of collaboration between CSIRO and industry.

'This kind of strategic investment by Australian industry in research and development has been rare' Dr Boardman said. 'Now, at the beginning of the 1990s, we have a real and substantial commitment by Australia's premier corporation to back research in areas they and CSIRO have identified as having a major growth potential'.❖

Entomology opens new high-security quarantine facility

Australia's latest and most modern high-security plant quarantine facility was launched, with much fanfare, at the Division of Entomology's Black Mountain site on 7 December.



Above, the Division of Entomology's sparkling new high security quarantine building at the Canberra Black Mountain site. Photo: Biological Control of Weeds Section.

The complex was officially opened by the Minister for Primary Industries and Energy, John Kerin, but as usual it was Max Whitten, the Division's outspoken Chief, who stole the show. Parts of his vitriolic address, in which he spoke of the folly of some of the government's funding cuts, made it into that evening's local television news.

The new facility will be used for importing biological agents to control the introduced weeds that are currently costing Australia more than $2 billion a year in lost production and control expenses. Such weeds are also a major environmental threat in natural habitats, suppressing native plants and animals.

Physical and chemical weed control is costly and can often be harmful to the long-term stability of the natural environment and agricultural ecosystems.

Apart from the need for effective weed control, there is a growing demand in Australia for long-term control methods that are both cost-effective and environmentally acceptable.

Biological control methods meet these requirements, and will help develop sustainable agriculture for Australia.

Plants that are introduced from other countries, either deliberately or by accident, often become weeds because they are free of the natural enemies that prey on them in their original habitat.

The new facility is designed to screen these natural enemies so that they can be introduced without risking damage to our Australian ecosystems.

These biological control agents may be insects or plant diseases, and they need to be securely quarantined on introduction to Australia while they are rigorously tested to ensure that they will not affect native or crop plants.

The complex is the final product of many years of effort, and is believed to be the best in the world for its purpose.❖

Environmental Mechanics scientists win awards

Two scientists from the Centre for Environmental Mechanics have recently been honoured by selection for prestigious awards.

Dr John Philip, Chief of the Centre, was awarded the inaugural Eminent Researcher Fellowship by the Australian Water Research Advisory Council (AWRAC) for his pioneering work on the mathematical physics of water movement in unsaturated porous media and soils.

The stipend that comes with the AWRAC Fellowship will allow Dr Philip to reduce his administrative duties for a year and mount a full-time attack on several important water research projects, including groundwater pollution from hydrocarbon leaks beneath the water table, and the design of underground cavities to prevent water entry from seepage.

Dr Tom Denmead, a senior principal research scientist in the Centre, was recently awarded the J.A. Prescott Medal of Soil Science by the Australian Society of Soil Science. The Medal commemorates J.A Prescott, the first Chief of the Division of Soils.

The award, given for an outstanding contribution to soil science, is in recognition of Dr Denmead's research into physical aspects of water, heat and gas transfer from soil through plants to the atmosphere, and on the formation of ammonia and nitrous oxide in flooded and upland soils and their emission to the atmosphere.❖

Profile:

John Wilcox Stocker

John Stocker, MB BS BMedSc PhD, comes to CSIRO from his position as Managing Director of AMRAD, the Australian Medical Research and Development Corporation, Melbourne.

Dr Stocker, who is forty-four, was formerly Director of Pharmaceutical Research at Hoffmann-La Roche & Co, Basel, Switzerland.

After topping Medicine at the University of Melbourne in 1970, he embarked on a career in medical research. At the Walter and Eliza Hall Institute he completed his PhD thesis on immunological tolerance, working in the laboratory of Professor Sir Gustav Nossal. Later he was a Member of the Basel Institute for Immunology in Switzerland, where he carried out research with monoclonal antibodies to human cell surface antigens.

He joined Hoffmann-La Roche & Co in their Basel headquarters in 1979. His first position in the Central Research Unit involved working on applications of monoclonal antibodies in diagnostics and therapy and leading an international task force into the scientific and commercial opportunities represented by biotechnology-based vaccines.

As Director of Pharmaceutical Research at Hoffmann-La Roche & Co he headed a department of more than 800 people. He was also a member of the company's International Research Board, with responsibility for assessing the commercial potential of scientific discoveries in major world pharmaceutical markets.

Dr Stocker is married and has two daughters. In his spare time he enjoys tennis, squash, tiling, gardening and reading.

curriculum vitae
Dr John Stocker

Name	John Wilcox Stocker
Date of birth	23 April 1945
Nationality	Australian and British
Qualifications	Bachelor of Medical Science (Melbourne 1969) Bachelor of Medicine, Bachelor of Surgery (Melbourne 1970) Doctor of Philosophy (Melbourne 1976)
Previous positions	
1976-78	Research Fellow, Basel Institute for Immunology, Switzerland
1979-87	Hoffmann-La Roche & Co Ltd, Switzerland (first as Scientific Specialist, then as Chairman of the Roche International Vaccine R&D Working Group, then as Head of the Immunology Department, and finally as Director of Pharmaceutical Research and Member of the Co-ordinating Board, Roche International Research.)
1987	Founding Managing Director, Australian Medical Research and Development (AMRAD) Corporation Ltd
1988	Chairman and Chief Executive Officer, AMRAD Pharmaceuticals Pty Ltd
Service to Government in Australia	
1988	Member, Biotechnology Consultative Group, DITAC
1988	Member, CSIRO Division of Biotechnology Advisory Committee
1988	Member, AIDS Task Force/CSIRO Joint Working Party
1988	Director, Victorian Government Strategic Research Foundation
1989	Member, Multifunction polis 'think tank' on biopharmaceuticals
1989	Member, Prime Minister's Science Council

Here we are again, trying to help, and ending up

between two thieves

PERHAPS science in Australia did need to lose a little fat, but for some time now it's been living on muscle. We've watched it go from plump through lean to anorexic. The front page of last month's *CoResearch* was largely given over to reporting a campaign by the CSIRO Officers Association to make the public, and through them the two big political parties, take a closer look at the condition of this bony old servant from whom they're expecting such prodigies of scientific work. With the election now so close that the birds have gone quiet, **Simon Grose** of the Public Affairs Unit in Canberra thought it was time to chat with the President of the Officers Association, **John Stephens**, about how CSIRO can make the most of the political realities.

***Grose*: Why did the Officers Association decide to run an election campaign?**

Stephens: Because, historically, and also because of the current government's attitude, the place of science has been degraded in the Australian community, and that bears down particularly heavily on CSIRO, which has been the main vehicle for science in Australia.

These are strong words, considering that the government has made it a plank of its policy that we need science and technology for the general development of this country. But if you look at all the relevant figures, the outcomes simply do not match their words.

And have you had any support from other organisations involved in science and technology?

I think the whole science community is deeply concerned, even outraged, by current circumstances. The most vital and effective expression has been the formation of the Federation of Australian Scientific and Technological Societies (FASTS) as a public policy and pressure group for scientists and technologists.

I attend their executive and council meetings, as a supernumerary rather than a full member, and they have certainly helped us in the trade union area, by helping us and other unions develop a science and technology policy for the ACTU.

We have tried through FASTS to get other bodies to join us in our election campaign, but I am sorry to say they feel too constrained by their financial circumstances to join us in this kind of effort.

How much money have you spent?

Our first pamphlet cost us just a few thousand dollars, and we have spent, I think, something under $20,000 on the second pamphlet and its distribution. As for our future effort, we have a fairly similar budget for that. But we want to spend it well so we're waiting; we're keeping our powder dry for the time being.

Did you get much support from OA members in distributing the pamphlet?

I could have asked for more but it wasn't too bad. Western Australia, half of South Australia, half of the Victorian and half of the Queensland effort was achieved with the help of members. The balance has been made up by using letter-boxing agencies.

To what extent do OA members see politics as an arena in which they can bring about the changes they want?

Well, my views of my members are very personal. Nonetheless let me be fairly frank about them. One of their major characteristics is their devotion to their work. They are also very conscious of the impact the political and economic processes can have on their future, on their work.

Yet they feel relatively powerless. They don't see, or can't envisage, levers they can put their hands on to bring about changes. Now we in the OA have been willing and indeed eager to get into the nitty gritty of these processes and do our damnedest. I believe we've been pretty successful to date but a lot remains to be done.

What can OA members do to support the campaign?

Be willing to speak up on all occasions on behalf of science and technology and CSIRO. It isn't always easy to do this in a socially acceptable way; it's pointless if you simply bore people. So, tell the story from their perspective.

If you have an opportunity to speak to an opinion leader, make sure you know your stuff, and make sure you can present it well. Really make every post a winning post on these occasions. We've got an interesting story to tell, so tell it well!

Will the OA campaign actively during the election?

We're not going to go out there waving banners for the ALP or the coalition. But we are going to wave banners for science and technology. We've got to do it in a very smart way – a very eye-catching way.

Can you see differences between the major parties on science and technology policy?

The ALP certainly must be commended for bringing a degree of analysis to the role of science and technology in our society. That's an important advance. However, they have let the ersatz theories of economic rationalism overwhelm their thought processes. In consequence, their fine words have actually led to a decline in the science and technology capacity of this country.

In the Opposition, we find ourselves faced with a body of belief that would give even greater emphasis to economic rationalism. But they perhaps also represent groups with a wider experience of, and probably more sympathy for, the role of science and technology, and greater trust in the judgement of individual scientists and technologists.

But you can't get out of them a specific commitment to a given funding level. One fears that they look on science and technology as an area for patronage rather than true commitment.

So it's a very betwixt and between kind of choice to make at the party level. That's why it's important to address voters directly.

On the Coalition ...
'One fears that they look on science and technology as an area for patronage rather than true commitment.'

Let's talk about redundancies and that whole general area. What role does the OA play?

The OA has a job to do on three levels, perhaps most importantly on a personal level. Once one of our people is identified as redundant, we play a role in ensuring that it is a case of true redundancy – that the work that person is doing really has been terminated by management.

The recent events in the Division of Entomology are a striking illustration of the value of this role. Several scientists were to be made redundant, but we've just had a turnaround in one case because of the nature of the statements made about a particular officer's role. He is now going to be kept on because CSIRO's management attitudes didn't correspond with the realities of the situation.

It's only by making CSIRO management do a good job in these cases that we can keep redundancies within bounds.

Secondly, Board discussions earlier this year raised the prospect that CSIRO could shed 500 appropriation-funded positions. The OA spoke up very vigorously and, as a result, we and other associations met with the Board. The Board subsequently decided to follow up an OA suggestion that CSIRO develop a human resources strategy that would enable it to plan its use of staff in a much more systematic way, a way that would be more productive for CSIRO with less chance of distress to staff.

The first part of this joint exercise between management and the staff associations – the drawing up of a Green Paper under the umbrella of the Consultative Council - has been completed. I don't think we've made anything like enough progress, but we have made reasonable progress when you consider that the Board asked two parties who are essentially in opposition to co-operate. There's a long way to go but it's on the right track.

Thirdly, the ultimate answer to the problem of redundancy is to get government to put in place funding arrangements for a level of R&D activity essential to Australia's future wellbeing. This would mean CSIRO could start to increase rather than cut staff numbers. So our political activity grows straight out of industrial necessity.

How do you assess the Organisation's efforts up until now at retraining and redeploying people?

They have not made any systematic effort in that direction to date: they saw no need for it when they had virtually an open go on employing staff on term.

We have addressed that by negotiating an award with CSIRO on tenure for staff. We see this award as being of great benefit to the staff in keeping the use of term appointments within reasonable bounds..

This will also benefit CSIRO because it should produce a much more dedicated, happy and productive workforce.

The Human Resources Branch in the Corporate Centre has been closely involved in this process. How do you assess their effectiveness?

You're asking me to assess the opposition? How does Bob Hawke assess Andrew Peacock in public?

You see them as 'the opposition'?

Our attitude towards the Human Resources Branch must obviously be ambivalent. They represent CSIRO to us on most occasions and if they are to be truly professional they must state the case for the Board and for the Executive Committee with all the skill at their disposal. On the other hand they must approach their job with realism, as must the officers of the OA. So we are to an extent both brokers on behalf of the parties we represent. There are some very humane and competent people in the Human Resources Branch.

Apart from funding shortfalls, the issue of redundancy has arisen because CSIRO is now assessing research programs in terms of priorities. Does the OA endorse this priority system of rating research programs?

I don't think the OA could, should, or would, dare openly endorse this priority-setting. But it's only realistic to face the fact that it's becoming more and more part of the system. That's why our redundancy activities also have retraining and redeployment linked with them. We need to accept that programs cannot roll on for ever. At some stage reorientation, redirection, must be very seriously considered.

There is a good way and a bad way of going about this. The bad way is to impose it. The good way is to encourage people to be always on the look-out for

On the ALP ...
'Their fine words have actually led to a decline in science and technology capacity.'

new and better and novel directions of research. This is the traditional CSIRO approach.

It seems people have varied in their ability to cope with the compromises. It's very much a personal response?

Indeed, it is partly the personalities of the individuals concerned, but it is also to a large degree the kinds of fields they are in.

This policy of priorities comes from the top insofar as the government has identified national priorities and the Board is continuing that process. How does the OA value this approach?

One must value it in some degree because it is the natural outgrowth of a logical approach to the utilisation of science and technology in the national scene. But it does not truly resolve the problem of how you allow in your priority-setting for what is the absolute essence of science: being at the frontier of discovery. National priorities should be set in the broadest possible terms.

Does that mean you see our present priorities as too narrow?

I wouldn't argue that they are not important areas, but I would point out that those areas nominated in Australia would be the same as those nominated in just about any other country. So we are deciding to enter into races with other nations that have much more powerful economies and are willing to invest in science and technology at a much higher level than we are.

So you're saying there are some major races it may not be worthwhile our even starting in?

Not exactly. If we are to be in any race we have to take account of our own particular circumstances and our own particular abilities. And these have to be absolutely prime considerations.

Take an example: information technology. That's identified as a national objective.

Yes, indeed.

Our import bill in that area is very high. Our expertise is small compared to some of the larger countries. In some areas, in some niches, it's world class. Now, accepting this is a national priority area, how would you devote effort in that area?

I believe we should start with where CSIRO has obviously been successful - in the software area. What I'm thinking of here is the crop management systems for cotton, the MicroBRIAN system for remote sensing or remote surveying, and so forth. Where we should not get involved directly is obviously in competition with companies such as IBM, NEC or Fujitsu. It would be incredible for us to try to do a mainframe computer or something like that.

Is there room for us to look at supplying components to those companies?

That's very much more a prospect, in my view. We should look to making components that can be fitted into the world scene. We're already going that way with AUSTEK. And, I would guess, one should talk to Clive Mudge about this. He's got runs on the board, but does he sleep easy at night?

The government set a goal for CSIRO: 30 per cent of total funding to come from external sources. How do you see that goal? Do you see it as a limit and do you see it as achievable?

Philosophically, I have no problem with CSIRO being required to get 30 per cent of its funds from other than appropriation sources. I don't believe it should be any higher than that because it's well recognised that the most important research is strategic research and only government funds it in Australia.

On the private sector ...
'If they don't want stick, they should chase the carrot.

Our big problem in trying to get 30 per cent external funding is simply that the projected sources of these funds have shown great reluctance to enter into arrangements with CSIRO. I know that my colleagues are more than happy to talk to industry, to try to make arrangements. Many have spent many a frustrating hour, or day or week, attempting this. And yet the results for their efforts have been most discouraging. We see this requirement, therefore, as a source of frustration rather than as a source of hope.

Frankly, we believe we've done more than our fair share in trying to make that system work well. And if I have any criticism at all of the CSIRO Board, it is that they have failed to speak up sufficiently critically of Australian industry to get them to play their part in the game initiated by government policy.

One can be just as critical or even more critical of the government for its failure to really make its policy function by bringing pressure to bear on industry.

The government would say they have the 150 per cent tax scheme. Would you contemplate or promote some kind of compulsory levy? How should government encourage the private sector to put money into R&D - with a carrot or with a stick?

Our experience to date definitely indicates that we need not only a carrot but a stick. And the amount of stick applied depends on how well those being offered the carrot respond to the carrot. If they don't want stick, they should chase the carrot.

What form of stick would you have?

Oh, levies. It's the only way.

Getting back to the OA - union coverage of CSIRO is split between a few camps. Do you foresee any changes or trends?

I see some changes there but I can't be specific about them. We're conscious that almost 3,000 of CSIRO's 7,000 staff members fall within our coverage. We're very proud that something over 2,400 of those people voluntarily choose to be members of our association. And our rate of resignation is trivial, apart from those people who leave CSIRO.

The Officers Association is obviously going to be caught up in the push for larger unions. That push has been mounted by the ACTU, particularly Bill Kelty. We've given very considerable thought to the direction we want to take.

There are two choices. One is to be embraced within a general public service type union. The other is to go in the direction of a general professionally based union. Our choice at the present time is to go towards a professionally based larger union. Our reason is that we're looking at the future very positively in terms of the policies we see CSIRO and the government embracing.

The future should see a greater exchange of personnel between CSIRO and the private sector. Now we want people to transfer between those two sectors with a sense of having proper and due coverage and care for them by the one union.

So the union would be no impediment to that?

No union impediment. And, frankly, we think there is a large and growing role for professional people within the union movement. We are sure we've added to the ACTU's general profile and activities in a very useful way. For instance, we were a major party to the introduction of the science and technology section into the ACTU economic development policy.

The new CSIRO guidelines for public comment – do you have any views on them?

Yes. I've had a look at the new version and they are somewhat more cautious but I wouldn't say more restrictive than the guidelines they are intended to replace.

We have a new Chief Executive, Dr John Stocker. Do you have any comments on his appointment?

I don't know Dr Stocker. I've written to him congratulating him on his appointment, acknowledging that he's picking up a most challenging and stimulating position and stating that we look forward to a harmonious and mutually satisfactory relationship in the future.

Dr Boardman is retiring as Chief Executive after five years during a very difficult and complex time. How would you assess his period as leader of CSIRO?

I appreciate the general calmness that he has brought to the process, in what has been a very turbulent period. I'm quite sure on occasions he must have felt overwhelmed by it. And he's certainly been subject to an enormous amount of criticism. I would challenge many of his critics to have done better than he has done.

What lies ahead for the OA?

Well, I certainly don't see the forthcoming election campaign as the end of our political activities. Barry Jones was absolutely right in characterising us as 'wimps'. We have to shed that label and never let it be pinned to us again.❖

The CSIROOA election campaign aims to raise the importance of R&D funding as an election issue.

In November last year almost 350,000 pamphlets entitled 'Your Future is in the Balance' were distributed to letterboxes in nine marginal Federal electorates: Chisholm and Isaacs (Vic), Barton and Lowe (NSW), Kingston and Hawker (SA), Moreton and Forde (Qld), and Moore (WA).

John Stephens is also considering targeting North Sydney, the electorate where popular Independent Ted Mack is intending to stand.

Earlier in 1989, prior to the May Statement on Science Capacity, a pamphlet entitled 'Science is the Issue – CSIRO is the Solution' was distributed to politicians and media by the Association. It was supported by personal contact and lobbying of MPs. John Stephens believes this effort provided a significant input into the generation of the May Statement.

CSIROOA President John Stephens: 'Barry Jones was absolutely right in characterising us as wimps. We have to shed that label and never let it be pinned to us again. Photo by Chris Taylor.

Upping the tempo on the green debate

by **Barney Foran** *of the Division of Wildlife and Ecology at Alice Springs, joint author of the controversial 'Rangelands Policy'.*

Recently I was asked, through our Institute (INRE) to take part in a series of investment seminars with an investment firm by the name of NATWEST. The people attending the seminars, in Melbourne and Sydney, were the managers, sponsors and trustees on superannuation funds to which we PAYE workers usually contribute.

These people deal in millions, hundreds of millions, and thousands of millions. The decisions they make – whether to go 'short' or 'long' on clean or dirty industries, green or non-green companies, and sustainable or non-sustainable land uses – guide how this country operates, and what we'll be like in fifty years time.

The response was terrific! Mind you, I didn't win them over, but we communicated. All these company people want to do the right thing but they are not getting good information, certainly not in a form they can integrate into daily decision-making. Wesley Vale and Coronation Hill came up repeatedly, and in a very negative way. The bodies who co-operated in the technical, bureaucratic and political sides of those decisions are seen as the enemy.

Now, I'm not saying that those decisions were wrong, but what I am saying is that we in CSIRO, as an organisation, have been so eager to grovel to big government that we have failed to give our reasoning to the people who make the real decisions. It's about time we, as CSIRO scientists – including Directors, Board Members and Chiefs – romanced the trustees of superannuation funds as to what this 'environmental' or 'greenie' push is all about. It may take five or ten years to have an effect, but we will do more on this tack than with all the boring papers we will be writing in the meantime.

The proposal

All of the vaguely 'biological' and 'environmental' Institutes within CSIRO have senior scientists who are firstly generalists and interested in their national obligations, secondly are good performers who like to woo and romance an audience, and thirdly are robust enough to eschew scientific method and accuracy in the interest of getting the policy implication across, rather than scoring scientific points.

I propose that we develop the bare bones and graphics of a fifteen-minute 'investment and environment' talk so that we have consistency but can add personal and Divisional colour. Once we've worked out a hit list of the biggest superannuation funds and important corporations, then our senior scientists must each woo a number of trustee and/or board meetings per year for a two-year period. This will have more effect than all the AOVs (adjustments of variances) they'll otherwise do in a lifetime. Of course it's not real work, but then do you want to influence the debate, or continue just to react to it?

A fascinating sideline to the meetings was the interest in 'greenhouse', particularly the effect that coal will have. We export a lot of the black stuff as everyone knows, and it's the big nasty that will contribute increasingly to greenhouse. The mood of one group was to 'go big' in coal shares, but live away from pollution and rising sea levels. My advice to the meeting was to give CSIRO a hundred million a year for ten years, and in that time we'd have a suite of new technologies that would keep it environmentally benign. I'm still waiting for the cheque, but I'll send it to the appropriate Division when it comes.

What follows is the bones of my address. You may disagree with bits and pieces of it, but it worked! Together we could do a lot better. Much better than trying to influence the bureaucratic drones one finds in some Federal Government departments.

The Environment: grab it before it grabs you!

The bad news

Been for a swim off Bondi recently, especially after the morning surf report notes 'pollution problems'? Drunk any water from the Murray-Darling System? You flush the dunny in Bourke and drink it six months later in Adelaide. *Another Australian first* - 50% of all the mammal species that have gone extinct in the world during historic times are Australian . That's 18 Australian 'cute and cuddlies' out of a world total of 36. We've also got another 40 mammals that are on the endangered list, or threatened with extinction. Then there's 'climate change' and 'global warming', caused in part (if you can believe the boffins) by the massive release of carbon dioxide into the atmosphere that will come when the present 5 billion tonnes per year rises to 10 billion by the year 2010.

And the root cause? The 5 billion people - and still growing - who all want some tucker each day, wouldn't mind a colour telly, and even probably a motor car if things work out okay.

All pretty depressing stuff as it churns out of the media machine, with the 'greens' and the 'reds' and the 'browns' all trying to feather their own nests, with their deep concern for the environment.

The economic problem

Notice that we always call it *the environment*. That's the real problem. You see, it doesn't belong to anyone! Who owns a clean atmosphere, a sparkling stream, a state forest? We all say the environment belongs to society and the state. To most of us with a busy life and our bankcard debt to pay, that means a gaggle of grey bureaucrats obstructing our well-laid plans, and sometimes a mob of environmentalists, who are probably on the dole and single mothers to boot.

The basic cause of any environmental problem, real or imagined, lies with the economists, their economic models, and their management rationales. Somewhere along the line, economic theory has developed a tragic and fatal flaw. Macbeth could not have done better! The theory needs revamping, and economists are the only ones who can help us fix it up. Even more than the ecologists and the greens, the economists hold the key to the human future. But if they are to help us construct a sustainable future then they have to change their 'Land, Labour and Capital' perpetual motion machine.

Somehow they have to introduce an equation that admits a negative feedback, a degradation, if the resource is overused. We can all accept the basic premise of substitution – if a coal mine or Bass Strait oil comes to the end of its useful life, then there's always another coal mine, or the Timor Gap field, ready to fill the void – at a price. But what do you substitute for elephants, ozone, clean air, numbats and nail-tailed wallabies? Do new cars, good hospitals and holidays abroad substitute for clean water, healthy trees and safe beaches? As a real estate salesman said to me on the Atherton Tableland a year ago 'They're not making land like that any more'.

Discount rates are a major philosophical problem for an ecologist. Applying discount rates in the short run means that a country that freely pollutes its air and erodes its soil will grow quicker than one that tries to live off the income of its natural resources. In a fishery, discounting future earnings may encourage a company to catch the last fish and invest the proceeds; they nearly did it with whales. The crossover point is somewhere around a discount rate equal to twice the fastest rate at which the fishery resource can reproduce itself.

Perhaps we need to introduce the concept of Nett National Product (GNP minus depreciation). What then are the implications for our growth rate of 3-6%? Studies by some reputable world bodies have shown that land use and soil erosion problems in Thailand and Indonesia might approximate to 0.3-2% of GNP. It is often a bitter joke with the greens that environmental clean-ups such as the one following the Alaskan oil spill contribute to a country's economic activity (money spent, jobs generated, widgets used) rather than being a deduction from the national income. The effect of treating our national capital – the environment – as free, is generally to overstate increases in national income.

What can we do about the environment?

Tax the polluters and let them trade in pollution permits. Make money from effluent, degradation and soil erosion! Figures from Europe indicate that Holland, France and Germany collect pollution taxes of (US)$39, $5 and $2 per capita per annum respectively. Which country will end up with the better lifestyle? American estimates suggest that an emission charge of $50 per tonne of sulphur dioxide and $2 per kilogram for 'suspended solids' in water would make $3.5 billion per year for the US treasury. New technologies combined with sensible economics can avoid environmental damage, or at least make that use a sustainable one. Even for the rich, a degraded environment may reduce the value of economic growth. It's no use hanging in there for a few more years with the hope of a rainforest retreat in North Queensland if some 'developer' has gone and clear-felled it to make one hectare of housing blocks!

It is worth targeting the 'green' market. Big, well-run companies will prosper if they trade in clean knowledge. The 'greenest' countries can expect an added bonus. By meeting tough laws at home they gain a competitive advantage overseas.

Once again the Swedes seem to be setting the agenda for the paper-making process. Another success is a giant vacuum cleaner for hoovering bugs off organic vegetables. Banks who give interest rate discounts for well insulated, energy-efficient housing designs are sure to liberate more business from the better educated middle classes.

Good environment presents a viable alternative opportunity for investment, but perhaps not at a 15% return on capital. The return will be lower, and, if well managed, more constant. Whether it be furniture timbers instead of wood chips, bush camps instead of 'five-stars', or pure beef instead of beef+dieldrin+hormone, products of natural ecosystems are where Australia still has a relative advantage.

A change of heart

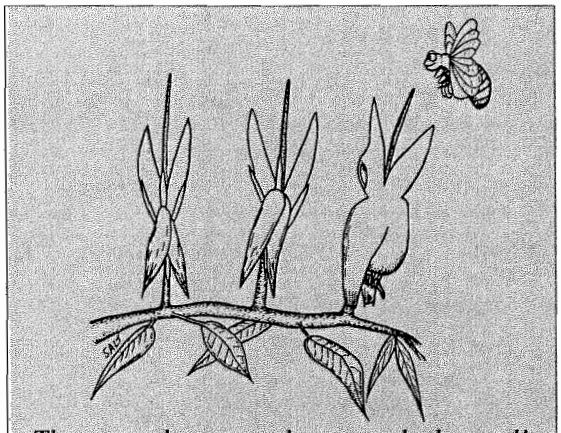
Above all, we have to target the quality of the product and accept that a sustainable industry is one that grows slower, produces less per annum, gives off different vibes, and retains a resource base that is still productive in a hundred years' time.

Nowhere is this more evident than in our tourist industry. Forget the Sheratons, forget the Mirage Resorts, forget the coastlines fringed with marinas. If you like, leave them to the tourists!

We should be seeking the traveller – hungry for the quality product, hungry to know and understand it. They come to see our natural environment, and they'll keep coming back if we don't destroy that product with inappropriate development.

The three big areas of wilderness left in the world are the Amazon, Antarctica, and the Australian inland. The Amazon will be gone by the end of the century. Antarctica is too bloody cold. That leaves us – three-quarters of a continent with its natural vegetation still more or less intact. Rich in the opportunity for experience, rich in Aboriginal history, but most of all there's quiet, and room to swing a cat. Try camping under a tree in Africa. Pretty soon there's a hundred people from the village over the hill all around you. And there's no bloody firewood for miles.

Naturalness, time, and space! That's what we've got to sell with flair and feeling, and sell at a premium!❖



There are always new lessons to be learned!

Made in Australia - and cheap!

Two CSIRO scientists have played a key role in a new Australian book on polymer science – 'Polymer Update; Science and Technology' – put out by the Royal Australian Chemical Institute.

Dr Bruce Guise, Division of Wool Technology, was co-editor and author of the introductory chapter on the history of polymer science, and Dr Ezio Rizzardo, Division of Chemicals and Polymers, wrote one of the main chapters on chain growth polymerisation.

What sets it apart from other books on our library shelves is that all the authors are Australian and it was printed and published in Australia. The book is proof that it is possible to produce small print runs and sell at prices below imports if we take advantage of the latest desktop publishing technology, in this case Macintoshes and IBM clones.

The enterprise grew out of the realisation that many chemists, physicists, materials scientists and engineers work with synthetic and natural polymers, but have had little or no formal or recent training in polymer science. In other words they need an update.

The book begins with polymer synthesis and moves onto the molten polymers and their solidification, which is the basis of polymer processing. The final section looks at the mechanical properties of plastics and rubbers relating properties back to the chemical structure.

('Polymer Update' (305 pages) is available from the RACI Polymer Division, PO Box 224, BELMONT VIC 3216, at the price of $50.)

Clarke and Foley back on board

Professor Adrienne Clarke and Dr Kevin Foley have been reappointed to the CSIRO Board until December 1991.

Both were members of the former CSIRO Executive and were appointed members of the Board when it was first established in December 1986, but their terms expired on 4 December, 1989.

Adrienne Clarke is Professor of the School of Botany and Director of the Plant Cell Biology Research Centre at the University of Melbourne. She is a member of the Australian Research Council and Chairperson of its Biological Sciences Advisory Committee.

Kevin Foley was until recently Professor of Economics and Director of the Centre for Quality Management and Decision Analysis at Bond University. He is Chairman of the Australian Wine and Grape Industry Advisory Council, member of the Victorian Strategic Research Foundation and member of the Board of the Standards Association of Australia.❖

American award for Dr Hariharan

Dr P. (Hari) Hariharan, a Senior Principal Research Scientist at the Division of Applied Physics, was presented with the Optical Society of America's Joseph Fraunhofer Award for 1989 at its Annual Meeting held recently at Orlando, Florida.

The Society cited Dr Hariharan's 'pioneering scientific and engineering contributions to interferometry, laser speckle and holography'.

The Award was created in 1982 to recognise internationally outstanding work in optical engineering leading to practical techniques, products or systems. It consists of a silver medal, a citation and a cheque for US$1,000.

New facility for Queensland students

The Brisbane CSIRO Science Education Centre (CSIROSEC) has been officially open since 15 November and is now operating at full capacity for Queensland school students.

The students and their teachers are delighted with the hands-on experience offered by the Centre and are keeping it fully booked.

The formal opening was performed by Brian Littleproud, the then Queensland Minister for Education, Youth, Sport and Recreation, and Mary Crawford, the Member for Forde, which takes in the area around the Centre.

CSIRO's Double Helix Club also operates from the Centre and members helped out as guides at the opening.

Not content to keep to the new building on the Long Pocket site, the Centre's Manager, David Maynard, and the Double Helix Officer, Sue Scott, have embarked on an ambitious program of visits to non-metropolitan centres. They have been well received on the Gold Coast and the Sunshine Coast and will be in Rockhampton in late February.

The Centre is run jointly with the Queensland Department of Education, who provide the Manager on secondment to CSIRO.❖

Brian Littleproud (centre), Queensland Minister for Education, sports a Double Helix membership badge while he learns about Greenleaf Farmlab. Explaining the experiment are Double Helix member Alex Matovic (left) and the Manager of the new Science Education Centre, David Maynard.

New Chief and new name for Biotechnology

Dr Peter Colman began his term as Chief of the Division of Biotechnology on 18 December 1989, but he won't hold the job for long. The Division is about to change its name to Biomolecular Engineering, and Dr Colman will be its inaugural chief.

Peter Colman, who joined CSIRO in 1978, is best known for his work on the influenza virus, and earlier in the year announced a research breakthrough towards an effective flu treatment. This finding was as a result of ten years of research on aspects of the flu virus that other workers had abandoned as a dead end. He intends to bring the same degree of patience and intellectual independence to his new job as he showed in this research.

Dr Colman has an international reputation in the field of X-ray crystal structure of proteins. A Fellow of the Australian Academy of Science, he was the inaugural winner of that body's Frederick White Prize in 1984, and in 1985 was one of the first recipients of a CSIRO Medal.

His research has been directed towards designer drugs that can be used to treat viral diseases, specifically influenza. His findings in the area of flu drug technology have been licensed by CSIRO to the Victorian based company Biota Holdings. Biota are negotiating a multi-million dollar research and marketing agreement with the British pharmaceutical company, Glaxo, to exploit Dr Colman's research, which promises to reduce a bout of flu from something that can make us miserable for days or weeks, and even kill us, to something we can safely sniff at.

Nearly half the work of the 'new' Division will be aimed at enhancing the development of the Australian pharmaceutical and health care industries.

Dr Colman is excited that his appointment has come hot on the heels of the restructuring of the Division and consolidation of its research programs.

The Division has facilities in molecular structure analysis unique to CSIRO and Australia, and he is looking forward to establishing collaborative ventures with laboratories wanting to take advantage of this expertise.

Dr Colman's appointment is for five years, and he will be based in Melbourne.❖

Reviews

We can probably all agree that the future of science is in the hands of the young, but then, there are quite a few futures clutched in those eager little fists. How do we make sure that science isn't simply dropped to make room for more attractive goodies like the quicker, and juicier, rewards held out by the world of business?

***David Salt**, of CSIRO's Education Programs unit, has at least one answer: he's keeping an eye skinned for books that can show kids, and adults, the real usefulness of science, rather than just its intellectual appeal. Here are his first two offerings, together with a sizeable discount for CoResearch readers.*

Relevant Science

'What's this theory got to do with anything?' 'How does this discovery relate to the real world?' 'What's the point of this experiment?' Most science students have asked these questions, though not always out loud, throughout their school careers. Science is deeply entwined with our everyday lives, but it is often hard at school to bring out the relevance of blackboard and test tube science. Now there are two excellent books on the market that aim to do just that.

The Greenhouse Effect: Exploring the Theory seeks to make the greenhouse effect a more user-friendly concept. It describes more than 60 activities aimed at developing an appreciation of what the greenhouse effect is, how it is measured and what impact it will have. Written by CSIRO scientists and education specialists, the book is an authoritative and interactive guide to a phenomenon that will affect us all.

The other book is the fourth edition of Ben Selinger's popular **Chemistry in the Marketplace**. Selinger is a lecturer in Chemistry at the Australian National University and his book is an encyclopaedia of applied day-to-day chemistry. The sheer quantity of chemical information relating to every facet of our lives is staggering. Topics include garden, laundry, kitchen, pool, car, supermarket, chemist, hardware, software, cosmetics and many more. Once you've seen this book you'll never question the relevance of chemistry again.

Special offer: The Greenhouse Effect *reduced from $9.95 to $7.50;* Chemistry in the Marketplace *from $39.95 to $35.00.*

Please send me a copy of **The Greenhouse Effect**
Name:
.....
Address:
.....
Postcode:.....
Send to: CSIRO Publications 314 Albert Street
EAST MELBOURNE VIC 3002
Include a cheque/money order for **$7.50** (which includes postage)

Please send me a copy of **Chemistry in the Marketplace.**
Name:
.....
Address:
.....
Postcode: .....
Send to: Booksales, Harcourt Brace, Jovanovich Group, 30-52
Smidmore Street MARRICKVILLE NSW 2204
Include a cheque/money order for **$35.00** (which includes postage)

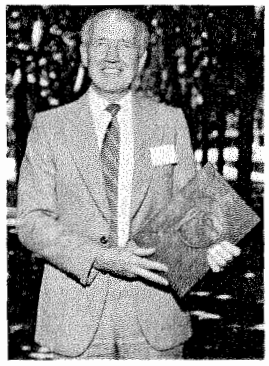
CSIRO Medals ceremony

The 1989 CSIRO Medals were presented at a lunchtime ceremony at Melbourne's State Film Centre on November 28.

ABC science personality Robyn Williams was the master of ceremonies, and Dr Boardman presented the Medals to representatives of the groups being honoured.

Mr Rob Rottenbury accepted the award for the raw wool measurement team of the Division of Wool Technology and the wool industry. The team members were the late Dr M.W. Andrews, Mr D. Charlton, Mr H.G. David, Mr S.A.S. David. Mr J.F.P. James, the late Mr B.H. Mackay, Mr R.A. Rottenbury, Mr R.B. Whan and Dr K.J. Whiteley. The team won its Medal for the introduction of objective measurement into the marketing of Australian raw wool.

The SIROFLOC team, represented at the ceremony by Dr Brian Bolto, were awarded their Medal for the development of the SIROFLOC process for preparation of potable water. The team members, all from the Division of Chemicals and Polymers, were Mr N.J. Anderson, Dr B.A. Bolto, Dr D.R. Dixon, Dr L.O. Kolarik, Dr A.J. Priestley, Mr W.G.C. Raper and Dr D.E. Weiss.



Above, Dr Brian Bolto proudly displays the medal his team won for SIROFLOC. Photo by Mark Fergus and Roger Lamb.

Dr Harry Green of the High Frequency Radar Division of the Defence Science and Technology Organisation accepted the Medal for development of Jindalee Over-the-Horizon Radar by a team including Dr G.F. Earl, Dr M.G. Golley and Mr J.A. Strath.

Dr Jim Peacock was the only individual to be awarded a CSIRO Medal, which he accepted in person. His Medal was for leadership of the Division of Plant Industry.

CSIRO's Film and Video Centre added greatly to the occasion by providing excellent two-minute video clips of each of the achievements.

After the formalities the guests repaired to the foyer for lunch and were entertained by CSIRO's own jazz band, the SIROCATS.

Above, CSIRO's own jazz band, the SIROCATS, tune up for a lunchtime trubute to the CSIRO medal winners. Photo by Mark Fergus and Roger Lamb.

Nearly all the members of the three teams that won awards were able to attend or be represented by a family member, which led to quite a reunion party as some team members had gone their separate ways many years ago.

The team from the Defence Science and Technology Organisation was also in high spirits: their Jindalee system had won the Minister's Award for Achievement in Defence Science and Technology just the week before. They chartered a plane from Adelaide to the CSIRO Medals ceremony and filled it with as many of their Division as it could hold.

One of the guests at the CSIRO Medals ceremony was Michael Meszaros, the well-known Melbourne scultptor who designed the Medal back in 1985. Several people, not for the first time, asked about the significance of the design; so here it is, in his own words.

'What every researcher does, regardless of the area of research, is to take an element of the unknown, to measure, describe, analyse and eventually apply it.

The design shows two hands, each taking a single thread from a tangled mass and each organising its thread into a definite state. One is large and the other is small and they overlap, reflecting the different scales of subject and the way different fields of research overlap and interlock.'

Battlers may beat the odds

Two young Adelaide students keen to pursue careers in science but handicapped by their serious physical disabilities have won CSIRO scholarships of $500 a year for the final two years of their secondary education. The scholarships, offered under CSIRO's Equal Employment Opportunity program, will also give them work experience in the Division of Soils at Glen Osmond during this period, and, provided they successfully complete their Year 12 studies, a job at the end of it.

They will be invited to defer tertiary studies for a year to work at the Division as Technical Assistants, for whatever the full going rate then is. The hope is they will then go on to tertiary studies with a better idea of what they want to do and a better chance of doing it.

Both students have just completed Year 10, emerging – in spite of their disabilities, and in spite of the fact that both are active in community help projects – with average or above-average grades.

Alison Allport, who suffers from Marfan's Syndrome, studies at St John's College, Whyalla. She has entered many science competitions, has recycled paper, and is particularly interested in the greenhouse effect. She has already had some work experience, helping out at the local kindergarten.

John Hughes has cerebral palsy and often uses a typewriter to help him with his schoolwork. He has a part-time cleaning job after school.

The two winners were formally awarded the certificates entitling them to their scholarships at a ceremony on 18 December at the Division of Soils at Glen Osmond. Dr Ted Henzell, who now holds the title of Senior Executive Responsible for EEO as well as the more familiar one of Director of the Institute of Plant Production and Processing, spoke about the EEO program in general and the Adelaide scheme in particular, and introduced Dr Don Hopgood, Deputy Premier of South Australia, who presented the certificates to Alison and John.

Physical disability is only one of the types of unfair disadvantage the EEO program is designed to counter – but more of that below.

***Patricia Quinn-Boas** has the job of making sure there are equal employment opportunities for all of CSIRO's scattered 7,000-strong workforce. Below she offers a small, simplified sketch of that large and complex responsibility.*

(... and just what is an EEOO anyway?)

I love my work, but some days it feels like I'm pushing soap bubbles uphill with a pointy stick. After all this time there still seem to be as many misunderstandings about what an EEO program is all about as there are boring old jokes about sexual harassment.

No, it's not just about promoting women, and no, it's not just about avoiding sexist questions in a selection interview. That's part of it, of course, but there's much, much more involved.

First, and most straightforward, the law requires CSIRO to do its best to get rid of the proven disadvantage in employment experienced by a few groups in our community. Women are certainly the largest of those groups, but there are others. People of non-English-speaking background, people of Aboriginal or Torres Strait Islander descent and people with disabilities are the groups singled out by the legislation that applies to us, but there's nothing sacred about that list. We are free to add to it if we find other groups being disadvantaged in CSIRO, now or in the future.

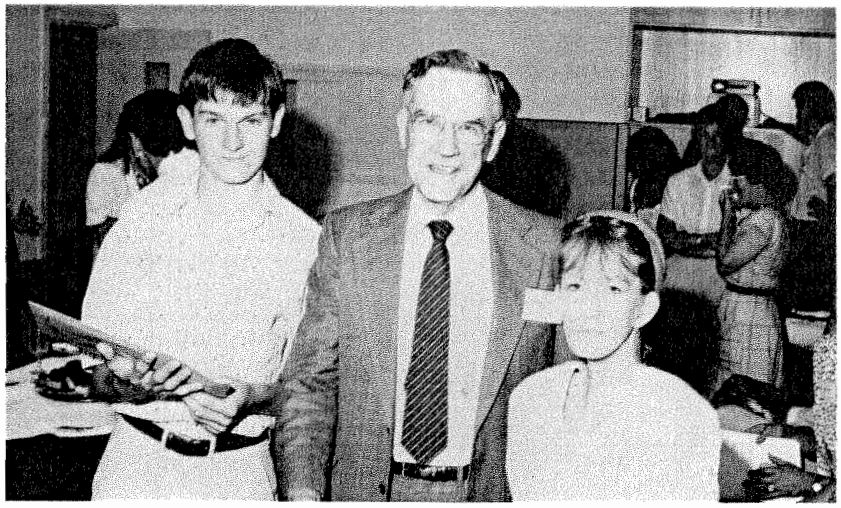
Lots of factors can lead to an employment disadvantage – different cultural backgrounds, conventional attitudes that have simply never been challenged or tested, outright prejudice or resentment against particular groups, and many others; but sometimes the strongest forces are the least visible. Members of the disadvantaged groups themselves often fail to 'stand up and be counted' when reforms are finally in the offing. The law, and the best intentions, can only help those who help themselves.

So, it takes a lot of selling to make an EEO campaign work. Managers have to be persuaded that tapping unused skills in the workforce will help them perform miracles with tiny budgets. Supervisors have to be convinced that sensitive handling of staff will lead to greater productivity. Finally, workers in target groups have to be made to believe in their right and ability to have careers at all, and to take part in decision-making. And that's the hardest selling job of the lot.

But the truth is that the buyer in each of those cases really is getting a bargain. EEO, at its best, brings together good manners, good morals and good management.

Well, anyway, that's the theory. Sometimes, some places, it remains just theory. When it does get put into practice, though, it offers one of those rare, rejoiceable cases where everybody wins.

Come buy my wares?❖



Above, Dr Ted Henzell, Director of the Institute of Plant Production and Processing, congratulating the two determined young winners of CSIRO scholarships that will help them pursue careers in science in spite of their physical disabilities. John Hughes, left, has cerebral palsy, and Alison Allport suffers from Marfan's Syndrome.

Above, the co-ordinator of CSIRO's Equal Employment Opportunity program, Patricia Quinn-Boas, at the Adelaide scholarship awards ceremony.

Fellowship for John Archer

Dr John W. Archer of the Division of Radiophysics has been elected a Fellow of the Institute of Electrical and Electronics Engineers, New York, for his 'contributions to low-noise millimetre-wave receiver design'.

The Fellowship recognises unusual distinction in electrical engineering, and is conferred on those who have made an important individual contribution that leads to a better quality of life for society. It is by invitation only and requires the support of at least five Fellows. There is also a limit of one-tenth per cent of membership who can be advanced to the grade of Fellow in any one year.

While with CSIRO Dr Archer has been responsible for expanding Australian research and development in gallium arsenide (GaAs) based microwave devices.❖

Obituary Owen Williams

Vale, Owen Benson Williams

It is with sadness that we record the passing of Owen Williams, an Honorary Research Fellow with the Division of Wildlife and Ecology, on 4 January 1990.

Owen was one of the pioneers of the demographic analysis of plant populations in pastures, publishing one of the first lifetable studies of pasture grasses. His early work was with the Division of Plant Industry at Deniliquin, where he was initially appointed to CSIRO in February 1946 following his graduation from the University of Melbourne in Agricultural Science. Much of this work was to become classic, whether it be his studies on Mitchell grass or Wallaby grass, pastoral history in Deniliquin, ecology of the Riverina plain, plant-soil relationships in irrigated and semi-arid conditions or pasture species in semi-arid rangelands (e.g. Oldman Saltbush).

In 1961 Owen transferred to the then Division of Animal Physiology at Prospect, continuing his work as an ecologist but concentrating on plant and animal production studies. He then transferred to the Rangelands Research Unit (RRU) in Canberra in 1972. The RRU became part of the Division of Land Resource Management in 1973 and Owen formally joined this new Division. During this period his research covered resource assessment and inventory and demography of grassland communities. This research was continued by Owen following the restructure of CSIRO in 1978 when he transferred to the Division of Water and Land Resources. Then another restructure in 1986 saw Owen (and the group with whom he was working) transfer to the Division of Wildlife and Ecology, from which he retired as an SPRS in July 1988, after 42 years service to CSIRO. Although he had retired Owen continued to work as an Honorary Research Fellow at both the Division and the ANU's Centre for Resource and Environmental Studies.

Owen was an ecologist before the name was fashionable (indeed, before many knew what one was) and, throughout his working life developed expertise (and maintained his interest) in three main areas:

- semi-arid and arid ecosystems - vegetation stability, animal performance and conservation;
- pastoral industries as ecological systems; and
- research application.

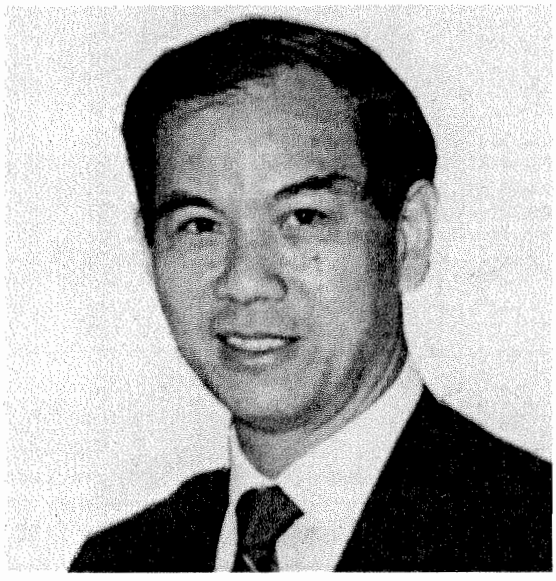
In addition to his substantial achievements within CSIRO Owen took an active part in organisations affiliated with his research and its applicability to industry. In 1987 and 1988 he was Vice President of the Australian Society for Animal Production, becoming President of that Society in 1989 and recently being elected President for 1990.

Owen had an enormous fund of knowledge of the long-term dynamics of Australia's semi-arid pastures which he shared freely with others. His colleagues within CSIRO, from the many Divisions in which he worked, will miss him. To his wife, Rita, and her family, we all extend our deepest condolences at this time.

Steve Atkins
Divisional Secretary
Wildlife and Ecology

Obituaries

Ming Leung



Professor L.S. 'Ming' Leung, Chief of the Division of Coal Technology, died on 2 January 1990 after battling against cancer for almost a year. In true Ming style, this battle was waged with a positive determination, awareness and acceptance of the realities, openness of mind, courage and generosity of spirit.

Ming came to CSIRO with a distinguished record in the field of gas/solid mechanics. Born in Hong Kong in 1936, he graduated top of his class in Chemical Engineering at Imperial College (London) and continued his studies in fluidisation at Cambridge, being awarded a PhD in 1961.

After some years working in Wales and Malaysia, Ming came to Australia in 1967 as a Senior Lecturer in Chemical Engineering at the University of Queensland. In 1979, the University honoured him with a personal chair in Chemical Engineering and from 1981 to 1985 he headed the Chemical Engineering Department.

In 1986, when Ming took on the leadership of the then Division of Fossil Fuels, CSIRO was beginning to 'open up' in many ways, providing opportunities that he was quick to exploit. Ming's three years with CSIRO have had a great impact on both the Division and the coal industry.

His innovative style of research management led to sustained high morale in his Division, rapidly developing relationships with industry, success in obtaining external funding and the launching of several commercial ventures. Since 1986, external support for the Division's research has risen from 10 per cent to more than 30 per cent.

Ming provided the environment for these changes, not only by his open entrepreneurial approach, but also by developing and strengthening his personal contacts within the coal and energy industry and the research community. With his encouragement, the Division also widened its interaction with industry through a series of workshops to examine the problems of the Australian coal industry.

Underlying the Division's success was Ming's unique management style – an ability to inspire all staff by his vision for the future and his trust in their capabilities. His philosophy of managing people rather than projects was reflected in his willingness to devolve responsibility while encouraging new ideas and enterprises.

Ming's energy, charm and optimism touched all who met him. He will be sadly missed by his many friends and colleagues, not least for the 'ancient Chinese sayings' created for all occasions.

Division of Coal Technology
29 January 1990

Tilman Oppenlander

Dr (Walter) Tilman Oppenlander, a highly respected and exceptionally talented plasma scientist with the CSIRO Division of Manufacturing Technology, died at the age of 39 years during the late afternoon of Monday 20 November 1989.

Tilman Oppenlander joined the CSIRO Division of Manufacturing Technology on 14 December 1987 as a Senior Research Scientist to engage in industrially relevant plasma research and development projects being conducted by the Arc Technics Program at the Division's Melbourne Laboratory in Preston. From that time until his untimely death from cancer his achievements with the Division were truly remarkable. This particularly applies to the specialist contributions he made in the arc plasma physics area to industrially relevant research projects being conducted by the Division in collaboration with Siddons Ramset Ltd. He had been involved in the invention of a new type of electronic plasma torch control, the development of a new type of torch for plasma spraying, and the design and development of a new arc reactor for a range of plasma processing operation.

Possessed of a fine scientific mind, with clarity and objectivity in extremely complex thought processes, Tilman Oppenlander had an imaginative flair for invention and innovation, and was equipped with an excellent range of engineering and computing skills. He was a man who was always courteous and helpful to those with whom he came in contact, and very early on gained the respect, confidence and co-operation of his colleagues from CSIRO and the people from Australian industry with whom he became associated. Tilman's premature passing has been a great loss to the Organisation and its staff, and a setback to the progress of Australian arc technology and to the science of arc plasma physics world-wide.

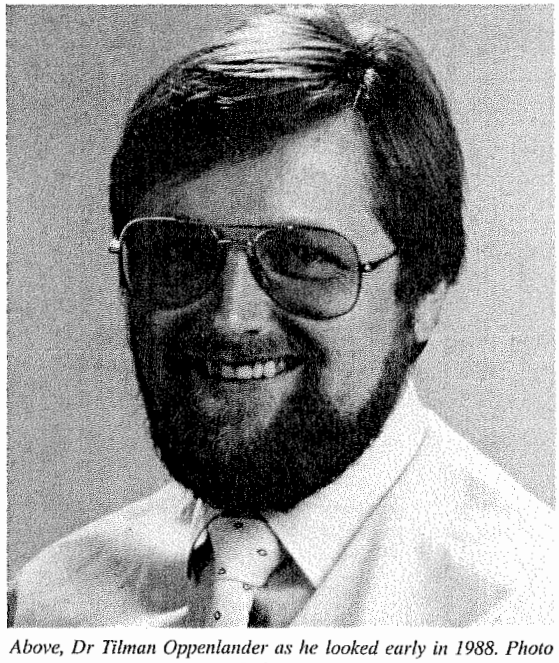
Throughout his illness Tilman had at all times shown a courageous and determined resolve not to admit defeat. However, the marked deterioration in his health that was to occur rapidly throughout the latter months of his life – and which was to become patently obvious to all of us who knew, greatly admired, respected and worked with him – did not inhibit his spirited resolve to continue working, nor indeed prevent him from continuing to make significant contributions to the Division's research right up until a few days before he died.

Walter Tilman Oppenlander was born in Stuttgart, West Germany, on 11 August 1950, and spent his school days in Ludwigsburg. His tertiary studies were conducted at the Universität Stuttgart, where in 1975 he completed his undergraduate degree in Physics, and where soon after in 1976 he was to be awarded the degree of Diplom-Physiker (an equivalent to our MSc in Physics), and then in 1981 the degree of Doktor-Ingenieur in the Faculty of Engineering (an equivalent to our PhD in electrical engineering). After periods during which he worked as a Research Fellow at the Universität Stuttgart and the Laboratori Gas Ionizzati CNEN (Comitato Nationale per l'Energie Nucleare) in Frascati, Italy, he joined the University of Sydney in the School of Electrical Engineering. After an initial period as a Research Fellow there, he was appointed as a Lecturer in January 1986. These pre-CSIRO activities provided Tilman with a broad range of experience in the research areas of plasma and arc diagnostics, computing and computer modelling, and design and construction. This work had many practical applications in high current and voltage power and control, and in addition his plasma research dealt with extreme parameters and high-speed diagnostic techniques. His contributions to the international literature were considerable.

In addition to being a first-class scientist and engineer, Tilman was a fine family man, and a devoted husband and father. He is survived by his wife Gisela, to whom he was married in April 1978, and their two children, Patrick, aged six, who was born shortly after he and Gisela arrived in Australia in early 1983, and Pamela, who is now five years old.

An extremely kind and thoroughly worthwhile person, and a researcher of the highest ideals, integrity and sense of endeavour, Tilman Oppenlander is sure to be long remembered by his family, friends and colleagues in both Australia and Europe.

Murray Houghton
Division of Manufacturing Technology
1 December 1989



Above, Dr Tilman Oppenlander as he looked early in 1988. Photo by Helen Niblett.

CoResearch **is produced by the Public Affairs Unit for CSIRO staff and interested outsiders. Readers are encouraged to contribute or offer suggestions for articles. Stories may be reproduced, provided acknowledgement is given to both *CoResearch* and CSIRO. The deadline for contributions is the last Monday before the issue month. Editor Liz MacKay, PO Box 225, Dickson ACT 2602. PH: 062-48 4567. FAX: 062-48 4641.**

CoResearch

No. 331 April 1990 CSIRO's staff newspaper

CSIRO AUSTRALIA

The Labor package

What's really in it for us?

The promises have been made and the votes counted. Now it's down to hard cash. Last month's rhetoric begins its metamorphosis into this month's actuality.

Mr Hawke promised in his policy speech to deliver 'a framework of education and science policies to prepare our young people for the challenges of the 21st century'.

He also promised 'a plan to protect Australia's precious environment for all time, for all Australians'.

The government has committed itself to a package of science initiatives including

– a national network of fifty world-class co-operative research centres;

– an extra $5.7 million a year over the next three years for greenhouse research (This money will go to both CSIRO and the Bureau of Meteorology, and will be used to establish a dedicated research grants scheme administered by the National Greenhouse Advisory Committee.);

– an additional $1.25 million, over three years, to CSIRO to further research on the effects of the cane toad, and short and long term measures for controlling it (It is envisaged that this funding will be matched by relevant states and the Northern Territory.);

– an extra $1.25 million, over three years, to combat the spread of mimosa pigra through effective biological control agents (Mimosa pigra is a fast-growing prickly shrub, from Central and South America, which is invading Northern Australian wetlands at an alarming rate. It also threatens Kakadu National Park and Aboriginal lands.);

– $3 million for upgrading and transferring CSIRO's Division of Forestry and Forest products to a new site on the University of Tasmania campus, and a special grant of $250,000 to facilitate the establishment of the National Centre for Temperate Forest Research.

CoResearch asked the Chief of the Division of Radiophysics, Dr Dennis Cooper, and CSIRO's Principal Secretary, Dr Beth Heyde, what they thought were the implications for CSIRO of Labor's win.

Below, representatives from the corporate and the divisional camps offer their opinions.

from Dr Beth Heyde –

The new Labor Government was elected after a campaign that, for the first time I can recall, gave a discernible profile to research support with direct implications for CSIRO. Key people involved in achieving this included not only Ministers and their direct advisers – especially the Chief Scientist and the Prime Minister's Science Council – but CSIRO staff who liaised and advised on various proposals. Politically, the outcome is tangible evidence that the government is increasingly aware of the science community's mood, effectively expressed by CSIRO and other scientists in recent years. But the closeness of the election reflects widespread concern about how Australia is to meet the challenges of the next decade, and the Government's inclusion of research support in its political strategy is also a demonstration that it believes science and technology have an essential role.

The Co-operative Research Centres program recognises the importance of having world-class scientific and technological capability in CSIRO and other research institutions in Australia. It has been set up, on the advice of the Chief Scientist and the Prime Minister's Science Council, in response to two perceptions. Even in traditional areas of strength, Australian laboratories are finding it increasingly difficult to have both the concentration of researchers and the expensive facilities and equipment needed to keep pace with rapid developments occurring internationally. There is also increasing concern about the standards that can be achieved in undergraduate and graduate programs, with implications for future quality and performance in CSIRO, the universities and the private sector.

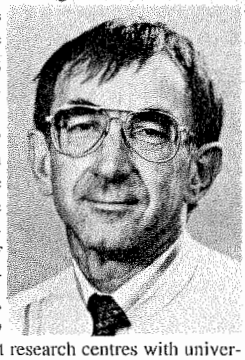
The new program sends a much-needed signal to researchers who have been operating in short-term research positions that the pool of opportunities, and their career prospects, are expanding.

However, there are no guarantees from the incoming Government for CSIRO's budget in the next triennium. The general trend internationally, as well as nationally, is towards more specific-purpose funds rather than direct funding. We will need to argue our case well, backed by the most compelling information available on contributions made by CSIRO research to Australia's development and the care of its environment, and on why public sector research is necessary.

The fact that the Opposition did not give support for science a significant role in its own political strategy shows that there is more work to be done in seeking the bipartisan support that research warrants.

from Dr Dennis Cooper –

One Chief's view of the Federal Labour Science Platform? Well, it really boils down to the Joint Research Centre proposal; I'll leave commentary on the environment to those far more competent than I. A cynic might be inclined to say that in a tight squeeze ... However, that's probably being too ungenerous! What we really are seeing is the first tangible result from the establishment of the Science Council and the position of Chief Scientist, and a measure of Ralph Slatyer's influence.



Like most scientists to whom I've talked, I'm excited and pleased by the possibilities. Already I've been approached by universities and Divisional staff about proposals. Our Institute, led by Bob Frater, is already committed to close collaboration and joint research centres with universities across the country. We've long felt the need to interact more with postgraduate students and academia and to take full advantage of our individual and combined talents.

On a different note it's interesting to look at the numbers: 50 research centres, 20 scientists per centre, up to 1,000 new research positions and 100 million new dollars matched by equal existing funds. It certainly starts to redress the poor science funding. But does it do enough? How realistic is it? At face value, this equates to about $200,000 per scientist in a centre; that's without stopping to analyse the effects on existing programs, how many new staff are appointed or the additional burden of establishment. At the moment CSIRO runs at around $160,000 per professional. Most of us believe it's too low and a convincing argument can be made that it should be doubled.

So what's my point? Maybe social equity is being taken too far. Would it be better to be a little brutal and only aim for say ten or twenty really well-funded joint research centres?

Those new research centres –

The national network of co-operative research centres will create an additional 1,000 jobs for Australian scientists.

They are to be established over the next five years, built around outstanding research leaders, and will pool the talents of research groups from CSIRO, other government research organisations, the universities and private enterprise.

Each participating group will retain its separate institutional affiliation but the centres will allow for integrated collaborative research teams.

Whenever possible they will be located on or near university campuses, enabling non-university staff to take part in undergraduate and research training.

This should help in the establishment of strong graduate schools in the universities and will enable students to benefit from contact with many outstanding researchers who are at present outside the university system.

When the new centres are fully established (at government expense, and using 'new' money) the Federal Government will provide $100 million a year in additional funding to support them. They will average about twenty full-time researchers, and cost around $4 million a year each.

Co-operating institutions will be expected to provide the other half of resources for each centre. An institution's contribution would normally include the cost of existing staff facilities and research support.

The Prime Minister's vision is that instead of young Australian scientists having to go to Europe, America and Japan to find the leading edge of scientific research, their scientists will be coming to us.

Come in Stocker!

The following is an extract from our new Chief Executive's address to headquarters staff at the barbecue they held to welcome him on 9 March. The audience response can be seen in this picture taken by Julie Faulkner of Plant Industry.

First up, I'd like to thank you all for making my initiation to the new job so easy. It hasn't been only big things – like the openness and co-operation I've been met with – that have impressed me. I was grateful, too, for the way CSIRO staff helped my family settle into the new house in Canberra before I was able to get there.

It's the little things that really matter. Like when I sat down for the first time, thrilled but tense, at that new desk – the desk of the Chief Executive of CSIRO – and everything around me looked so alien and new. And then my eye fell on the stationery and pens. One biro was – pre-chewed. Now, that was nice. Mind you, when I reached out, and picked it up, and read 'AUSTRALIAN GOVERNMENT F' along the side, I wondered if it was a message of some sort!

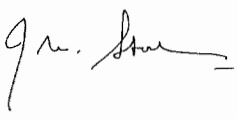
So, what am I doing here anyway, in this job where I'm a man of such consequence that I don't even have to chew my own pens? Well, in a way it *is* all about consequences, and about leading an organisation of real consequence. This country is in economic danger, and I think CSIRO is the instrument with the size and strength we need to help us work our way free. I want us to take charge of that instrument, and I want to lead a team with that as its mission.

Having said we've got the size and strength we need for that job, I ought to say I'm not at all sure we've got the flexibility, at the moment. Our structure, I think, is excellent. It's a very normal sort of structure for a large research organisation. But now we have to make it work.

It hasn't been quite clear so far just what the different roles of the Board and the Executive are, and I think one of my first jobs is to *get* it clear. When the Board first asked me if I would take the job I said 'Look, I am interested, but only on the understanding that this Organisation should develop a clear view of the roles of the Board and the Executive Committee working with the Chief Executive. We'll be looking to you for the sort of back-up a large company Board gives its staff'. There was general acceptance of that, so I think our chances of giving some real leadership to the Organisation look good.

My idea of what that 'real leadership' should consist of in practical staff terms does not include another round of 'restructurings' at a time when what is needed is some continuity. I want to make sure you have the facilities and equipment you need, and I want to make sure you have terms and conditions of employment that are attractive and competitive with other sectors of industry. The very future of science as a profession is on the line.

My third priority at the moment – but it *is* a priority – is to get the best possible value from the efforts of the Organisation – that is, to translate our ideas and technologies into the best possible products. I aim to have us more appreciated, and more successful, than we have ever been. Because I am convinced that what's good for the CSIRO is good for the nation. And never more than now.



Letters to the Editor

Dear Editor,

I draw your attention to a misprint in issue no. 330 (February–March 1990) of *CoResearch*, in case it has escaped your notice. It occurs in the item, on page 10, headed *CSIRO Medals ceremony*. To the casual observer it appears that my brother (who is non-existent) and I shared in the achievements of the team from the Division of Wool Technology recently recognised by the award of a CSIRO model.

I am not so much concerned at the creation of a brother as at the omission from the list of the name of my good friend and valued colleague Mr S.A.S. Douglas of AWTA Ltd. I leave it to you to correct this error in the most effective manner.

H.G. David
Chatswood, NSW

Editor's note: I apologise for the repetition of Mr David's name in place of that of Mr Douglas. The passage in question should have read as follows:

Mr Rob Rottenbury accepted the award [i.e. the CSIRO Medal] for the raw wool measurement team of the Division of Wool Technology and the wool industry. The team members were the late Dr M.W. Andrews, Mr D. Charlton, Mr H.G. David, Mr S.A.S. Douglas, Mr J.F.P. James, the late Mr B.H. Mackay, Mr R.A. Rottenbury, Mr R.B. Whan and Dr K.J. Whiteley. The team won its Medal for the introduction of objective measurement into the marketing of Australian raw wool.

I feel I must point out, however, that I did not write that the prize awarded to Mr David, his ghostly brother, and the rest of the raw wool measurement team, was a CSIRO model, *as Mr David's letter claims. Had I done so, perhaps Mr Douglas would have been just as pleased to have had his name left out?*

Dear Editor,

I am one of the so-called 'haves'. I am a contract computer programmer and analyst and have spent two and a half years at the CSIRO working on a large variety of the mainframe administrative systems.

I have finally succumbed to my urge to reply to some of the letters from divisional staff in recent issues of CoResearch, and in particular to some of the disjointed ramblings of Dr Robert Sutherst in your last edition. [*CoResearch* No. 329, Dec. 89 – Jan. 90.]

1. I do not have a PC. The person who works next to me does not have a PC. Nor the next. The only people who have them are staff required to be on call to fix system problems and who can use their machines to save them time (and hence CSIRO money) by dialling into the mainframe. Are scientists usually so happy to misrepresent reality?
2. Is it normal for a scientist to build a hypothesis based on the 'reputation' of a subject (e.g. computer consultants)? One hopes not. Most of the contractors probably feel as I do, though: 'There is only one thing in the world worse than being talked about, and that is not being talked about' (Oscar Wilde). Who talks about Dr Sutherst?
3. If so many ES programmers could do my job, why are they not contracting out their talents? Is it that the sick pay, leave loadings, and other perks (which effectively double the cost of the base salary to CSIRO of employing a full-time staff member) are more attractive to them?
4. The quality of any system, written in house, which is used by divisional staff also reflects on the users. Trying to extract user specifications for new systems has sometimes been like trying to get extra funds from the Government.
5. How can you slag the CSIRO Corporate Centre and then act surprised that staff working there feel personally slighted?
6. Scientific and industrial research would not continue in CSIRO without the organisation. In view of this, the traffic between HQ and Divisions should be two-way. There is no point in simply sending out centre staff for a week or six months without the reverse occurring. Divisions will still refuse to believe that Limestone Avenue serves a useful purpose.

By the time you receive this, I will have completed my term with CSIRO and have left behind many good friends. I wish them all luck.

Jonathan 'Jonroy' Coleman

Dear Editor,

I would like to thoroughly endorse Alister Sharp's remarks about the new CSIRO bonus scheme. It seems that CSIRO scientists are being urged to become greedy; or is it assumed that we are naturally greedy and that our greed has previously been thwarted?

CSIRO scientists are among the lucky people in that we, the majority of us probably, do work that is challenging and interesting and are reasonably well paid for it, and may even be for the national good. So why taint this with the bonus scheme money, with all the problems outlined by Alister Sharp?

Howard Crockford
Division of Water Resources

Dear Editor,

When reading Dr Boardman's comments on the outcome of the visit by an Australian delegation to the Republic of Korea (CoResearch No. 329, Dec. 89 – Jan. 90) I recalled that in 1975 the Central Information Service (CILES) assisted the Koreans to establish a computer-based information service. In fact this service was essentially a clone of the CSIRO system. We maintained contact with the Koreans and trained a number in CILES.

Recently the Information Services Unit was visited by a staff member of the Center for Industrial and Technical Information (CITI) of the Korean Institute for Economics and Technology (KIET). The progress that the Koreans have made in the development of scientific and technical information services is very impressive. CITI is a large organisation with regional branches and a national online system providing access to overseas and local databases. The latter include Transferable Technologies from Abroad, Korean Scientists and Engineers Abroad, Imported Technologies, Masters and PhD Dissertations, and Korean Patents. CITI has specialised Divisions covering electrical engineering and electronics, mechanical engineering and metallurgy, biology and chemistry and business consultation.

Korea now has a national scientific and technical information organisation comparable to the Japanese Information Centre for Science and Technology (JICSTO and the Federal Republic of Germany's Fachinformationszentrum (FIZ).

One can only share Dr Boardman's puzzlement at the way science and technology is regarded in Australia. To paraphrase St Matthew (Chapter 13, Verse 57) – the achievements of Australian scientists and technologists are acknowledged in countries other than their own.

C. Garrow
Information Services Unit

A Matter of Opinion

This month's opinion comes from Bob McNamee of the Division of Forestry and Forest Products. It is a point-by-point rebuttal of Dr Alister Sharp's criticism of the new bonus scheme, which appeared in the December–January issue of CoResearch.

I would like to reply to Dr Alister K. Sharp's point of view as expressed in the 'Matter of Opinion' column, CoResearch No. 329. I must thank Dr Sharp for providing a framework on which to hang my views, and the following should be read in conjunction with his contribution, for balance.

Like many other staff, I am very happy with the recently introduced CSIRO bonus scheme. I believe the scheme will succeed in achieving its stated aim of encouraging staff to commercialise their inventions and it will enhance our future research.

1. As scientists we are easily motivated and enjoy delving into the unknown, solving problems. If you're better at it than others, I think you rate a little extra. What you do with this extra is your business. You may even donate it back if you feel so strongly about it. My bonus, if I ever get one, goes to my family. As it is, all costs are deducted first, so it doesn't cost CSIRO a cent. Of what's left, CSIRO gets 30 per cent of royalties, etc, for national interest projects (finance for work that industry won't touch) and your Division gets around 49 per cent. Isn't that enough?
2. The present, and, for that matter, proposed reclassification scheme cannot possibly match the bonuses I've heard of.
3. Being intelligent, we realise that, by collaborating, the original idea comes to fruition earlier and commercialisation is more rapid. My guess, strictly 'a matter of opinion', is that the secretive loner wouldn't stand a chance. Nor would anybody want him on their next team. Kicking ideas around with your peers works.
4. Some education in commercialisation is a good idea. Use Sirotech as well. That's what they're there for.
5. Scientists may be seekers after truth. However, we must sell to businessmen who are there to make a dollar. They'll promote your product if, and only if, they can see a profit. Education again. Incidentally, contracts nowadays have a performance clause to stop shelving.
6. Not all inventions take 10 to 15 years to bear fruit. Chemicals and Polymers have one that took 18 months from idea to final product on sale. If you're against the scheme, then a wait of 10 to 15 years won't affect you, will it? For myself, either I'm fully occupied following through or, hopefully, inventing something else. No one has to just wait.
7. Maintaining the real value of general salaries has always been a struggle. Pay peanuts, get monkeys. Because there is a lot more to selling your idea than just a thought experiment, help from quality staff will be needed in all areas. This scheme, fairly managed, rewards only those who contribute.
8. To overcome conflicts of interest may I suggest an outside arbitrator or committee? This could be paid for out of royalties.
9. Many people may be involved in the production of a successful invention and, at the moment, it's up to our top management to allocate bonuses fairly. However, remember the Bonus Incentive Scheme is primarily a reward mechanism for invention, uniqueness, originality, and projects of national importance.
10. With regard to one-off payments, I would have thought it possible to grant a licence that gives the buyer all rights for all time. If so, the payment may be considered a licence fee.
11. The time component of each person's contribution can be calculated and presents a trivial problem. Keep a lab book. The invention component is another matter and is management's job.
12. Collaboration between Divisions boils down to collaboration between individuals, and it's the individual's contribution that matters, not the name of his or her Division.
13. Given a few years of operation, the 30 per cent of royalties allocated to 'Achievements of National Benefit' should produce a very large kitty. I think the problem won't be who to give a bonus to but how much to give to each. Of course, since our last reorganisation all our research is in the national interest, so nobody should miss out.
14. Finally, it's up to management just how equitable the system is seen to be. As mentioned before, perhaps more people would embrace the scheme if outside arbitration were introduced.

I'm sorry about this tirade. I just wish people would offer constructive criticism, not just brickbats.❖

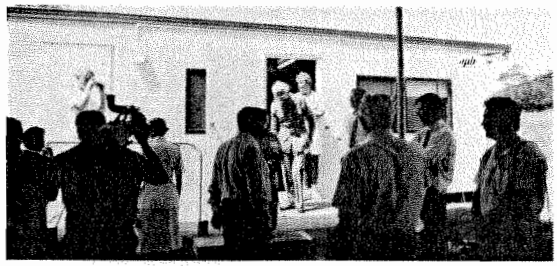
Jacques-Yves Cousteau drops in to Jervis Bay

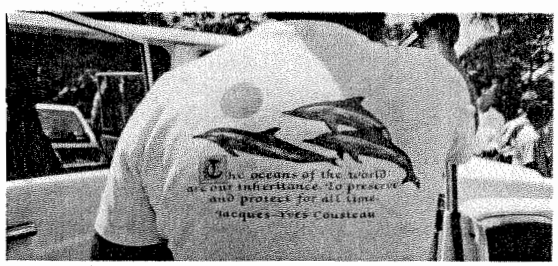
World-famous marine explorer Jacques-Yves Cousteau paid a visit to CSIRO's Jervis Bay Marine Laboratory on 21 February. He was joined by Senator Graham Richardson, Federal Minister for the Environment, and Barry Jones, Minister for Science.

CSIRO is on contract to the Defence Department to carry out baseline studies of Jervis Bay and provide the results for input to a management plan for the area.

Dr Trevor Ward, who heads the Laboratory, joined Cousteau and the two Ministers on a flight over the Bay area in a Navy helicopter before showing them around the CSIRO Laboratory now established in the grounds of HMAS Creswell and explaining the work being done there.

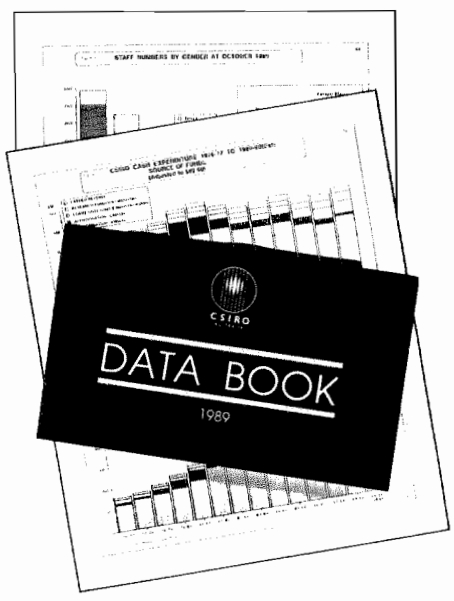
The party then spent some time on the white sands of the Bay, providing 'photo opportunities' for eager television and press crews, before taking on the more important business of a boat trip to look at Jervis Bay's seagrass beds.❖





Above, top, Jacques-Yves Cousteau is given a tour of the Jervis Bay site. The bottom picture seems to show that some at least are willing to back Cousteau's campaign in public.

Send your fingers on a fact-finding tour...



...through the pocket-sized data booklet just released by the Corporate Resources Branch. Gaze in wonder at its rows of towering bar graphs, wander fascinated through its background comparisons, be charmed by its neat little calculations, enjoying a few delightful local pie-charts as you go. Best of all, come back an expert and impress the boss! There should be a copy in your library; so have a look and let us know what you think. Contact **Malcolm Robertson on 06 276 6222.**

Oceans Australia 1990

Melbourne 10-11 May

In an effort to help Australia take advantage of its opportunities for developing international industries based on marine science and technology, the Commonwealth Department of Industry, Technology and Commerce is organising a series of annual conferences. *Oceans Australia 1990* will be the first.

The conference will focus on the innovation process, on economic, scientific and industrial development, and on legal issues associated with marine industries science and technology.

The conference will be held at the World Congress Centre, immediately following the Australia and New Zealand Conference on Southern Trawl Fisheries, organised by the Bureau of Rural Resources.

The cost of attending the conference (including the Conference Dinner) is $230.

For registration or for more details contact–

Ms Heather McPherson
Marine Section
Department of Industry, Technology and Commerce
GPO Box 9839
CANBERRA ACT 2601
ph: 06 276 1205. fx: 06 276 1206.

Out of the rough... onto the green

Keith Boardman's memories

***Dr Keith Boardman** has now retired as Chief Executive of CSIRO, but here he pauses to take a last look back over his shoulder at the organisation he leaves behind him – so different from what it was, so different, perhaps, from what it will be soon – and offers some insights won from often painful adaptations to the times.*

First, salad days...

When I joined this Organisation, in the period following World War II, I was young and fit for anything, full of the energy of high hopes and recent victories and a heady sense of righteous freedom. So was Australia, so was Australian science, and so, in triplicate, was CSIRO.

There had been a breathtaking advance in science and its applications with the rush of war. That wasn't just us of course – remember the Germans and their rocket work – but certainly Australia performed magnificently.

Now that it was all over, and we had won, there was enormous new enthusiasm for the potential of science. Governments all over the world began to believe that the more money, and people, and resources, you put into science, the more you would get back, that the economic return in peacetime would mirror the results gained by such spending during wartime.

That enthusiasm continued all through the fifties and sixties, and the resources just kept pouring in. In the mid-fifties it was quite common to get 250 new positions a year, at a time when the Organisation was half the size it is now.

That meant there was tremendous opportunity to support the best programs and the best people. And it meant, too, that Australian science was very competitive at that period, and so was salary structure. In 1972 the Australian dollar was running at about 1.4 times the American dollar. I can remember going to a US–Australia conference in Hawaii where the Americans were getting a daily payment of $50. The Australians were getting the same – $50 – but when the Americans found out it was worth 70 of their dollars they weren't all that chuffed. How times have changed!

It wasn't until the seventies, really, that we heard the first murmurs against this trend. People began to ask 'Is science in fact producing the goods? Where are the products, the processes, from all this money?' They began to see the dark at the beginning of the tunnel, and to back off. More and more people were saying 'we can't go on for ever increasing resources for science and technology. Are we getting the most out of what we're spending? Let's just have a look and see where we are.'

Of course, we tend to trail the rest of the world by a few years, but more and more often the murmuring voices were Australian.

Now that change is very interesting when you think about it, because if you go back to the early history of CSIRO, from 1926 until the Second World War, you find that while we did give great freedom to our scientists to decide for themselves how they would carry out their research, the broad problems and priorities were clearly defined. There *were* national priorities. The areas that were selected in those early days were very much related to Australia's economic position and the need for science to be applied to improving the competitiveness of our agricultural industries, forest industries, and mining. For example, we worked on making more use of Australian hardwoods, and minerals, and overcoming the pests and diseases of our animal and plant industries.

But then, during the post-war period of euphoria about science and its benefits, the period of my early service with CSIRO, there was less concern, in a way, about national priorities. Instead, we tended to expand into areas that had started during the war because they were needed then, for the war effort – manufacturing areas.

The later pulling back from unthinking spending on the science effort wasn't the only change that came with the seventies. It was then that concern for the environment really started getting up, causing a great expansion in environmental work. Some of the CSIRO Divisions that had been concerned with agricultural production moved over into more environmentally related work, toward resource management.

Then in the late seventies there was concern about the oil crisis and we began to put resources into aspects of energy research.

But it wasn't until about 1980 that the real crunch came. That's when we started to see the decrease in resources in real terms, and that's what led to the big changes, I think.

Well, it can be argued, and most people would now admit, that there was some fat in the system. So for a while you can survive cuts in the budget by making yourself more efficient and cutting out some of the programs that have been less effective. But the longer that goes on, as people have been finding out, the more often you find yourself cutting back on programs that are already too scantily resourced, making them smaller and therefore less effective in terms of possible output. And that's what we've been doing over the last five years.

Mind you, I don't think it would be fair to say that the decrease in government funding that has driven us to that sort of self-mutilation has been directed particularly at science and technology. It really is part of a general reduction, and it's been applied pretty well across the board.

then Birch...

The Birch inquiry of 1978, now, that was another matter. That was when I first came up on to the Executive, and it was the first really major review of CSIRO that was ever carried out. It really did define the role of a government research organisation in terms mainly of strategic research. It used the word 'mission-orientated', and brought out the importance of keeping our science up on the front line of advancing knowledge. But at the same time it stressed that we must be much more concerned about how we transfer results of that research.

That was the same year that Paul Wild was appointed Chairman, and he was here for seven years, till 1985. It was during that period that we were beginning to pay a lot more attention to how we commercialised or transferred the results of our research. It had always worked well in the rural area because, first, there were plenty of customers out there and, second, much of it was transferred for free by the State Departments.

With the changes though, technology transfer even in that area has become more complicated. We now have the private sector, the agribusinesses, more involved in commercialising the results of research. For example, a new plant variety is likely to be commercialised through a seed company. If we develop a vaccine, as we are doing with the tick vaccine, we do it in conjunction with a commercial firm and therefore it will be commercialised by that firm. Even the Meat and Live-stock Research and Development Corporation realise the benefit of commercialising some of the research they support in this way. And they are using the royalties to pay for more research.

Often it has been necessary for CSIRO to do much of the development work to commercialise the results of our research, but if Australian industry were much stronger, and had a stronger research and development effort, then research results could be picked up at an earlier stage and we wouldn't have to take the development as far. Another result of industry's being stronger would be a reduction in the amount of short-term contract work performed by CSIRO at the market end of the spectrum. I want to distinguish very clearly between commercialising the results of our research, for which we get a royalty or a licence fee, and doing contract work of a tactical, short-term nature, direct problem-solving for industry.

It would be nice to see a situation here more like the one that's been developing in England recently, with industry doing more of the near-market research. Mrs Thatcher has decided that such research is really better left with industry and that the government should be more concerned with strategic work. I must say that's very much my own view.

and ASTEC ...

The big change that came out of the ASTEC review was the replacement of the Executive with the Board. It's always been thought of as one of the traditional strengths of this Organisation that it was headed by scientists. All the previous Executives had a mixture of the full-time scientific members and the part-time members, drawn from industry, the community, and the universities.

I did argue at the time that it was necessary to get a bigger representation on the Board of the full-time staff, because when you look at the high-tech companies, like BHP and ICI, you find that their boards are all made up of executive and non-executive directors.

I still don't think we've got the

ratio of executive and non-executive directors right. And I do think, as I said in a *Financial Times* article about two years back, that it puts an enormous responsibility on the Chief Executive to be the only link between the Organisation and its Board, as well as making it more difficult for the Board to be really in touch with the Organisation.

The ASTEC review team rightly perceived, I think, that it was very hard for the old Executive to separate policy and management; their main reason for proposing the Board was as a policy body, not getting too involved in management.

Of course, that's very difficult, clearly separating policy from management. If we stay as we are, and I think we will, then we've got to work out a better relationship between the policy body (the Board) and the executive body (the Executive Committee). We've got to be careful that the relative roles of those two bodies are defined, and I don't believe they have been defined as yet.

and McKinsey...

I brought in McKinsey's. I don't think it got much support – though the Board backed me – management bringing in consultants.

They decided they couldn't recommend anything about top management structure without looking at the purpose of CSIRO and what structure we had. That led to a group from McKinsey's working with CSIRO top management and coming up with a structure of Institutes and Divisions that related more to particular industry or community sectors than to scientific disciplines.

I do think it has led to the Divisions being more related to each other. Of course the main loyalty is still to the Divisions, but it is easier now for them to work together.

But the big danger is a splitting into mini-CSIROs, and the only real protection against that is the development of a strong sense of corporateness.

The public thinks of CSIRO as a corporate whole. The phrase means 'one body', after all, and that's what we seem to be, to them, if not to ourselves. If we lose that wholeness we will lose much of our strength as a multidisciplinary research organisation. CSIRO has a tremendous reputation internationally – better than we have at home, I often think – and that reputation is built on the strength of working in many different disciplines and areas of science and technology.

and the box.

The other big change in recent times is that suddenly everyone is interested in what CSIRO actually does. We were always thought to be a great Organisation, and we got a lot of support, but people didn't quite know what it was we did. I think we have to realise that the whole face of politics has changed: the pressures on Ministers are different, the media are now much more powerful than they were, particularly television. We've got to learn to live with the fact that people are much more interested in what CSIRO does. Not only that, but the pressure groups have an interest in and influence on what CSIRO does.

Now what?

To me, the future of CSIRO looks bright because the future of Australia looks bright. Unless the nation is doing well there will always be some danger that CSIRO won't be supported. I believe that if we can't maintain and improve our competitiveness as a nation then the future of CSIRO is poor, but I think we can do that, and will.

Of course there are problems – productivity levels, quality control, some inefficient transport systems, infrastructure... But moves *are* being made, and I find it hard not to be hopeful about Australia's future. We have low population density, considerable natural resources, and the brain power to really do something.

And if the future of CSIRO depends on the future of Australia, that cuts two ways. The future of Australia also partly depends on a CSIRO that acts as a catalyst and support for an expanding private sector.❖

Farewell to the chief

On Friday 2 March the Canberra staff of CSIRO held a barbecue in honour of Dr Keith Boardman, CSIRO's Chief Executive, to mark his retirement after nearly forty years with the Organisation. Below are some 'candid' shots of the event taken by Julie Faulkner of Plant Industry.

New laboratory, with echoes of the past...

by Simon Grose, of the Public Affairs Unit

CSIRO's newest research unit can be found in a modern building overlooking bushland in the northern Sydney suburb of Chatswood. The Ultrasonics Institute moved there after spending its first 25 years in the shadow of the Sydney Harbour Bridge at The Rocks.

The Institute was formed in 1959 as part of the Commonwealth Acoustic Laboratories (CAL), administered by the Department of Health. In 1975 it became a separate branch of the Department until mid-1989, when it joined CSIRO's Division of Radiophysics and became the Ultrasonics Laboratory.

Dr George Kossoff was 'a young electronics engineer' in 1959 when he was recruited to found the Ultrasonics section of CAL. In 1990 he is Laboratory Head with a staff of 18, including 10 research and experimental scientists and 6 technical officers.

Generally their work covers the fields of basic ultrasound physics, ultrasonic properties of tissues, ultrasonic imaging, Doppler techniques, digital signal and image processing, applications and techniques in diagnostic ultrasound, and biological effects of ultrasound.

These are the main areas of research being pursued by the unit:

Doppler Techniques – the quantitative measurement of blood flow and the variation of blood flow characteristics during the heart cycle. The unit pioneered this technique and is a world leader in its development as a non-intrusive diagnostic tool.

Improvements in Ultrasonic Imaging – the Subcutaneous Tissue Aberration Removal Scheme (STARS) is being developed to estimate the refractive effects of subcutaneous tissue and apply corrections to reduce their effects on image quality.

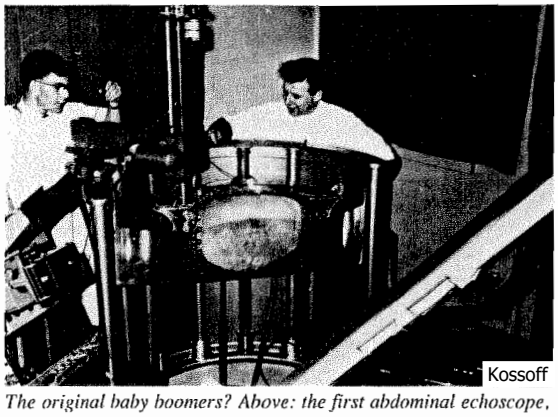
Tissue Characterisation – clinical measurement of sound speed within tissue, a subject the unit pioneered. Its application is being investigated in liver disease and in the evaluation of transplanted kidney.

Meat Processing – livestock and carcase grading for yield and quality, using ultrasonic image and echo characteristics.

Biological Effects – improving the understanding of the mechanisms by which ultrasound interacts with biological tissue.

Involvement with industry began early and is still a priority. Ausonics, an Australian company, has commercialised several products of the unit's research, earning at least $20m in export income.

Becoming part of the Division of Radiophysics has not radically changed the day-to-day operation of the Ultrasonics Laboratory. Closer relations with researchers at Radiophysics (a 10-minute car ride away) have become established and opportunities are emerging for synergystic collaboration.



The original baby boomers? Above: the first abdominal echoscope, built by George Kossoff (right) and Dave Robinson (left), and installed at the Royal Hospital for Women in Paddington, Sydney in 1961. The clinician in the project was Bill Garrett. The machine, which used echoes to examine the wombs of pregnant women, consisted of a trolley running on a circular track, and its original electronics were built entirely of vacuum tubes. The patient stood on an angled stretcher and her abdomen was brought into contact with the flexible window on the wall of the coupling tank.

postdoctoral awards

A selection committee chaired by Dr Ted Henzell, Director of the Institute of Plant Production and Processing, has selected ten recent PhD graduates for the CSIRO postdoctoral awards for 1990. The winners will be researching a wide range of topics including global warming, flu antibodies and the mating systems of blowflies. The Awards are for two years, one of which may be spent in an overseas institution.

awardees	project summary	host Division
Dr Bill Ballard	Molecular taxonomy	Entomology
Dr David Cook	Lucilia cuprina (Australian sheep blowfly] mating systems	Entomology
Dr Vincent Harley	Influenza antibodies engineering	Biotechnology
Dr Craig James	Impact of grazing on native fauna in arid and semi-arid rangelands	Wildlife and Ecology
Dr Heather Keith	Effects of nutrient availability on fine root dynamics in eucalypt plantations	Forestry and Forest Products
Dr David Luketina	Turbulence in a stratified fluid	Water Resources; and Oceanography
Dr Murray Rudman	Industrial multi-phase flow – numerical modelling	Building, Construction and Engineering
Dr Peter Ryan	Effect of plant roots on their rhizosphere	Plant Industry
Dr Simon Southerton	Gene cloning of oat-adapted isolates of the take-all fungus	Plant Industry
Dr Al Bing Yu	Size distribution of granular materials and its optimum control in industry	Division of Mineral and Process Engineering

If you have any questions about CSIRO's postdoctoral awards, contact Gary Lewis, Education Programs, CSIRO Corporate Centre, PO Box 225, Dickson ACT 2602, phone: 06 2766639, fax: 06 2766641.

Sir Ian McLennan Award

Nominations are now invited for the valuable 1990 Sir Ian McLennan Achievement for Industry Award.

Established in 1985 the Award recognises outstanding contributions by CSIRO scientists to Australian industry.

It provides the winning scientist with a grant of up to $10,000 to undertake an overseas study visit appropriate to the achievement. As well as the grant, the successful scientist is presented with the Sir Ian McLennan Medal, and the company or organisation involved in the development and/or marketing of the innovation is presented with the Sir Ian McLennan Plaque.

The criteria for selection will be based on practical achievement, such as a major commercial success or a practical advance of commercial value to a firm, industry or public authority, resulting from CSIRO work.

Nominations

Nominations may be from individuals or organisations outside CSIRO or, inside CSIRO, from individuals or from Chiefs or Directors nominating someone for an achievement in their area of responsibility. Where teams are involved, the team leader would generally be nominated for the Award itself, with the team receiving recognition on the accompanying plaque.

Each nomination should contain a one-page synopsis with the following information: a brief description of the innovation; the value of sales of the commercialised innovation for each year; the profit in dollars earned by the commercialised innovation; the value of royalties and licensing fees; and the number and location of patents.

A maximum of five more pages should include the following:

– the extent to which the achievement has received acceptance

1. in the market place (list history, tangible benefits to industry in dollars, and, where appropriate, the extent of market penetration and geographical coverage),
2. in government areas (list Federal and/or State Government acceptance, use, special grants and awards received),
3. in overseas application;

– comments on originality of the invention and/or degree of innovation of the development;

– whether the achievement is seen to have further application in Australia and/or overseas and an estimate of future sales, cost savings or economic benefits in dollars;

– brief summary of working experience of the nominee over the past ten years;

– details of any links with industry;

– summary of patents, patent applications, technology transfer to industry and publications in relation to the achievement itself and generally;

– any other details considered relevant to the Award;

– names of three referees including one from the company or beneficiary of the achievement and one from CSIRO.

Nominees should provide one original nomination and six copies by the closing date. Also they should ask their referees to forward their reports direct to Ms Robinson by the deadline below.

Nominations for the 1990 Award close on Friday 15 June 1990. The recipient of the Award is expected to be announced in October.

Further details may be obtained from Ms Karen Robinson, CSIRO Corporate Centre PO Box 225 Dickson ACT 2602, or phone: 06 276 6108, or fax: 06 276 6641.

No backpedalling on recycling, but are the wheels in motion?

Jenifer North, Manager of Corporate Communications, investigates ...

The current environmental debate about pulp mills, pollution and logging has heightened public awareness of the responsible use of paper resources.

In early 1989 the Public Affairs Unit began investigating the possible use of recycled and/or unbleached paper for corporate publications and for internal use at Corporate Centre.

We thought staff might like to know our progress so far, as we have been getting a growing number of enquiries from people in Divisions who are also interested in the topic.

For our own purposes at least, we have two key requirements:

1. recycled paper must not cost us any more money
2. it must perform adequately for our intended uses.

Why use recycled paper?

Studies of youth attitudes overseas show people beginning to react against companies or organisations that use heavily bleached, high-gloss paper, especially to promote themselves. Public opinion in Australia seems to support this. CSIRO is seen publicly as a responsible national adviser on environmental issues, so we don't want to alienate public and stakeholder opinion by over-lavish or unnecessary use of glossy paper.

The Federal Government is determined to introduce recycled paper for its own use where suitable. It is likely to place strong pressure on all government agencies to do likewise. In that case it is better for us if we already know how and where we plan to use recycled paper.

Government studies

The Department of Administrative Services (DAS) carried out a review of the potential for use of recycled paper in September 1989. The review committee had representatives from several federal departments on it.

The committee offered the federal government the following recommendations:

actively promote the use of recycled paper;
use its buying power ($55million a year spent on paper) to obtain the best possible price and to increase the range of products available;
issue policy guidelines on when and when not to use recycled paper; and
pursue an active national policy of recycling paper waste from Commonwealth offices.

Most offices in Canberra, including Corporate Centre, have already adopted the last proposal.

The committee also made specific recommendations on use. For instance it recommended that 100 per cent recycled paper be used for throw-aways such as message pads, internal phone directories, or media releases; bulk information pamphlets and newsletters; and any records with a life of less than ten years.

It warned that currently produced forms of mixed or 100 per cent recycled paper should not be used for the following:

applications involving photocopying, laser printing or high-speed printing;
documents used for public reference such as annual reports; or
records that need to be kept for a long time or used frequently.

However, I have recently been told that IBM and Rank Xerox are now considering extending their warranties and maintenance contracts to cover the use of recycled paper in their copying and printing machines. The Australian Government Printing Service (AGPS) has had no trouble in using some recycled papers in its high speed machines. Also, the paper manufacturers are steadily improving their range of recycled papers so the safe use of recycled paper in high-speed machines may be possible soon.

I can provide a full copy of the recommendations for those interested. The full report of the review will be published by AGPS in April.

Government action

DAS is modifying government contracts to include recycled paper as a supply for paper products. CSIRO can purchase through DAS if it wishes. Contracts have been signed, or will be shortly, for

padded bags and packing envelopes
memo, scribble and other pads
photocopy, bond and bank paper
adhesive-backed notepads
desk calendar refills.

DAS is inviting tenders for supply of envelopes, fax paper, computer paper, electronic whiteboard paper, diaries, toilet tissues, and handtowels.

The price of recycled paper products is still generally too high, although DAS says it has negotiated some very competitive prices. The NSW State Government already has contracts in place and the Victorian Government is also considering issuing tenders for its supply. I am told we are able to purchase through State contracts as well as Federal.

The Australian Archives are working with Standards Australia to develop standards for various grades of recycled paper.

AGPS have been developing and carrying out laboratory performance tests on different brands of recycled paper to measure their mechanical and chemical properties (e.g. strength and opacity). They are also trying out recycled papers on their printing presses and have already published two documents on 100 per cent recycled paper.

CSIRO action

There is no central CSIRO paper purchasing, so Divisions and sites are free to act on their own behalf. They can buy recycled products through commercial or Federal/State Government channels. Management has not issued any policy about recycled paper use in CSIRO; it is too early to do so and is probably more a matter for line management anyway.

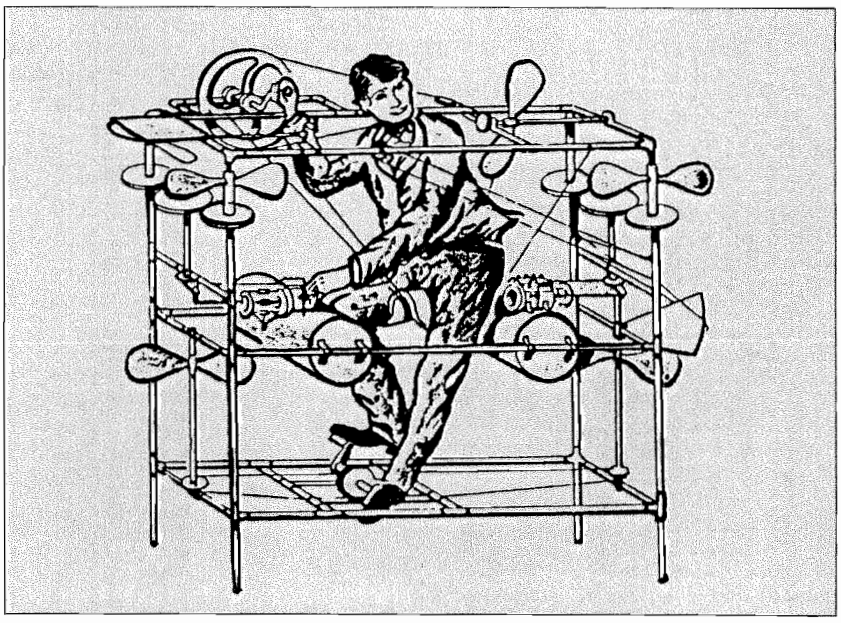
I would be most interested to hear about any trials Divisions are making with the use of recycled paper products. This would help me put inquirers in touch with other staff who want to take action.

As far as Corporate Centre goes, I am maintaining contact with the government departments and AGPS to keep abreast of what they are doing. I am also collecting a stock of promotional literature from paper manufacturers. Once some economic supplies become regularly available for such things as notepads, forms and so on the Corporate Centre (or parts of it) will try them out.

Public Affairs will be looking to use recycled paper where possible for some of its external CSIRO communications. However, some of what we produce has to stand up to long-term storage and/or frequent use (for example, the Annual Report and the CSIRO Guide), so we will probably still need to use traditional printing paper.

I welcome your comments and enquiries, and will be happy to pass on further information as I gain it. Contact me at –

CSIRO Corporate Centre
Public Affairs Unit
PO Box 225
Dickson ACT 2602
phone 06 276 6545
fax 06 276 641.



US honours John Trahar

William John Trahar, of the Division of Mineral and Process Engineering, was this year's winner of the American Institute of Mining, Metallurgical and Petroleum Engineers' A.M. Gaudin Award.

John Trahar US honors

The Award was established in 1975 to honour the work of Professor A.M Gaudin, internationally recognised as one of the giants in the field of mineral processing.

Mr Trahar officially accepted the Award, which singles him out for his contribution to the science and engineering of mineral processing, in Salt Lake City, USA, on 27 February this year.

'I value it all the more highly,' he said 'because it represents a recognition by my peers of the importance of the work of CSIRO to the mineral processing industry.'

Mr Trahar has been with CSIRO for 35 years. In that time he has been responsible for a series of research achievements in the flotation processes for the concentration, and economic recovery, of vital minerals such as copper, lead, zinc, nickel and tin. The application of this research has saved the industry millions of dollars.

His work has given birth to a new theoretical framework and technology for sulphide flotation mineral recovery.

Dr Alan Reid, Director of the Institute of Minerals, Energy and Construction, said the Award was a fitting acknowledgement of an outstanding record of achievement.

'Whether he is judged by his contribution to the basic science and engineering of mineral processing or the application of those insights to industry, Mr Trahar has a record without equal.

'At a key time in the development of his Division, Mr Trahar also successfully combined his research with the added management responsibilities of the post of Acting Chief of his Division,' Dr Reid said.

Telephone numbers

You probably already know all this, but some people were still having problems as I was finishing off this issue, so I thought it worth repeating. All Canberra phone numbers now have the area code *06* instead of *062*, the *2* having simply moved onto the front of the local number. In the case of Corporate Centre numbers it's a bit more drastic, with the first three digits of the local number having been changed as well – from *484* to *766*. The number for CC switchboard is thus now *06 276 6766*. The Black Mountain site keeps its old local switch number, becoming *06 246 4911*, but most of the other Black Mountain numbers will change, so check ahead.❖

Geelong Grammar is offering one closed scholarship again this year to a child of a CSIRO member. There are no precise age limits, and exams will be held in May. For details telephone the Director of Studies (on 052 739 259) rather than writing, as the official deadline for applications – April 2 – has already passed.❖

Another medal for Hariharan

The Royal Photographic Society of Great Britain has awarded Dr P. (Hari) Hariharan its Henderson Medal for 1989.

The award cites Dr Hariharan for 'his contributions to the advancement of the technology of holography, in particular for his work in the area of processing chemistry'.

The award was instituted in 1907 in memory of A.L. Henderson, a prominent figure in the photographic world, and is made annually for the best paper on photo-chemistry or some kindred subject.

Dr Hariharan worked at the National Physical Laboratory, New Delhi, and the National Research Council, Ottawa, and was Director of the laboratories at Hindustan Photo Films, Ootacamund, and Professor at the Indian Institute of Science, Bangalore, before joining CSIRO in 1973. He is currently a Senior Principal Research Scientist with the Division of Applied Physics in Sydney.

Dr Hariharan has more than 150 scientific publications to his credit as well as two books: Optical Holography and Optical Interferometry. He is a Fellow of the Royal Photographic Society, the Optical Society of America, SPIE, the Institute of Physics, London, the Indian Academy of Science and the Indian National Academy of Science. He played a prominent part in the formation of the Australian Optical Society and was its president for 1988. He has also been Chairman of the Australian National Committee for Optics since 1980. In 1984 he was elected to the Bureau of the International Commission for Optics as a vice-president and is now its treasurer. He was the recipient of the Optical Society of America's Fraunhofer Award for optical engineering last year.

Coming soon to a video screen near you!

Young Doctor Stocker, CE

(the video)

In his first forum with staff Dr Stocker answers some questions on matters of interest to us, such as –

relations between Corporate Centre and Divisions,
strengths and weaknesses of our administration,
the conflict between commercial confidentiality and professional freedom,
30 per cent external funding targets,
career structures in CSIRO,
the role of the Board,
and many more.

...

By the time you read this there should be copies of the video at each Division and site, but if not call Simon Grose, Public Affairs Unit, on 06 276 6478.

CSIRO helps move towards a fairer distribution of advantages

Two Year 11 Townsville students have been awarded study and training scholarships under the CSIRO Equal Employment Opportunity (EEO) program.

Andrea Hoey of Ryan Catholic Community School and Ricky Emmerton of Heatley State High School were chosen from a field of nine applicants of Aboriginal or Torres Strait Islander descent.

Dr Ted Henzell, Director of the Institute of Plant Production and Processing, officially presented the awards on 12 February at the Davies Laboratory in Townsville.

CSIRO's Co-ordinator of EEO Programs, Ms Patricia Quinn-Boas (see story in the February–March issue of CoResearch, No. 330) said Andrea and Ricky had won the three-year scholarship on the basis of their academic records and their interest in science.

'Andrea and Ricky impressed the selection committee with their self-assurance and motivation to further their interest and develop their skills in scientific research,' Ms Quinn-Boas said.

The students will receive a study allowance for the remaining two years of their high school education and will take part in work experience programs during that time.

This will involve them in work in laboratories at the Divisions of Soils, Tropical Animal Production, and Tropical Crops and Pastures.

After they finish high school Andrea and Ricky will undertake a one-year full-time CSIRO traineeship to introduce them to a broad range of career options in science and technology.

The traineeship will include a 13-week course in laboratory techniques.

'This pilot scheme, along with a similar program underway in Adelaide, is part of CSIRO's wider strategy to encourage young Australians to follow careers in science and technology' Ms Quinn-Boas said.

'We aim to offer the same support throughout Australia after evaluating the results of these initial programs.

'Townsville was chosen to host one of the two pilot schemes because it is a major provincial centre where CSIRO's research work covers a wide range of areas and is closely related to the needs of the local community.'❖

***CoResearch* is produced by the Public Affairs Unit for CSIRO staff and interested outsiders. Readers are encouraged to contribute or offer suggestions for articles. Stories may be reproduced, provided acknowledgement is given to both *CoResearch* and CSIRO. The deadline for contributions is the 15th of each month, but earlier is better, as issues fill up fast. Editor: Liz MacKay, PO Box 225, Dickson ACT 2602. Phone: 06 276 6567. Fax: 06 276 6641.**

CoResearch

No. 332 May 1990 CSIRO's staff newspaper

CSIRO AUSTRALIA

Who's got a beauter computer than you?

The Division of Information Technology now has a High Performance Computing and Communications Program under way at its Melbourne Laboratory. The new program was launched on 2 April and will, according to Dr John O'Callaghan, Chief of the Division, 'conduct research supporting the research and development communities in CSIRO, the universities, and industry'.

The program will also provide support for CSIRO users of our new supercomputer, the Cray YMP/216, officially commissioned by Barry Jones on 23 March at Leading Edge Technologies, the company that has been chosen to manage the computer.

'The supercomputer launch caps off a period of extremely good news for Australian Science' Mr Jones said.

'It comes on top of the high profile and importance given to Science in the Prime Minister's election launch.'

'The need for access to supercomputing facilities in CSIRO is growing, with a number of large research programs now absolutely dependent on them. This applies to work being done in atmospheric research, stress analysis, heat flow, fluid flow, and modelling of physical and chemical processes.'

'Linking of the supercomputer to laboratories in Adelaide, Brisbane, Canberra, Hobart and Perth, as well as Melbourne, will ensure that all CSIRO scientists have access to the processing power that the Cray provides.'

Senator Button wasn't able to attend the launch, but said that the involvement of Leading Edge Technologies would strengthen CSIRO's links with industry users. The arrangements between CSIRO and Leading Edge are such as to provide good opportunities for collaborative research programs with Australian industry.

Dr John Stocker, Chief Executive of CSIRO, said of this aspect 'I see the facility playing a vital role in the whole collaborative process, which is only just starting to get going in this country, whereby universities and industry can work more closely together, and public and private enterprise can join forces to rejuvenate the Australian research and development effort. I believe the facility will form a nucleus for national supercomputing.'❖

Below, Barry Jones, on the eve of the 1990 Federal election, performs his last public duty for CSIRO – launching the new Cray YMP/216 supercomputer.

CSIRO's new Chief Executive, Dr John Stocker, welcomes CSIRO's new Minister, Mr Simon Crean.

CSIRO gets a new Minister

Encouragingly early in his new posting as Minister for Science and Technology, Simon Crean has paid a visit to our Corporate Centre in Canberra. Mr Crean also showed what seemed like a genuine interest in the future of Australian science in general, and CSIRO's role in particular.

The occasion of the visit was a meeting of the CSIRO Executive Committee on 11 April. Mr Crean joined the meeting just after noon for a discussion followed by lunch, after first meeting privately with Dr John Stocker, Chief Executive. Committee Members described the discussion as 'extremely positive', and Dr Stocker reported that Mr Crean had expressed a keen personal interest in the work of CSIRO, particularly that of Sirotech and the whole field of technology transfer.

Richard Eckersley, CSIRO's Principal Issue Analyst, will be transferring temporarily to the Minister's Office, at their request, to advise Mr Crean on science issues.

Mr Crean was elected to the seat of Hotham, Victoria, on 24 March 1990, and appointed Minister for Science and Technology – and Minister Assisting the Prime Minister on Science, and Minister Assisting the Treasurer – on 4 April 1990. The Prime Minister, Bob Hawke, has expressly put Mr Crean in charge of the setting-up of the new Co-operative Research Centres designed to 'bring together Australian scientists of excellence from the Government, the academic community and the private sector'.

As well as CSIRO, Mr Crean will be responsible for the Australian Institute of Marine Science, the Australian Nuclear Science and Technology Organisation, the Commission for the Future, the National Standards Commission, the Snowy Mountains Engineering Corporation, and Housing and Construction.

A *very* condensed biography of the new Minister appears below; more in later issues.❖

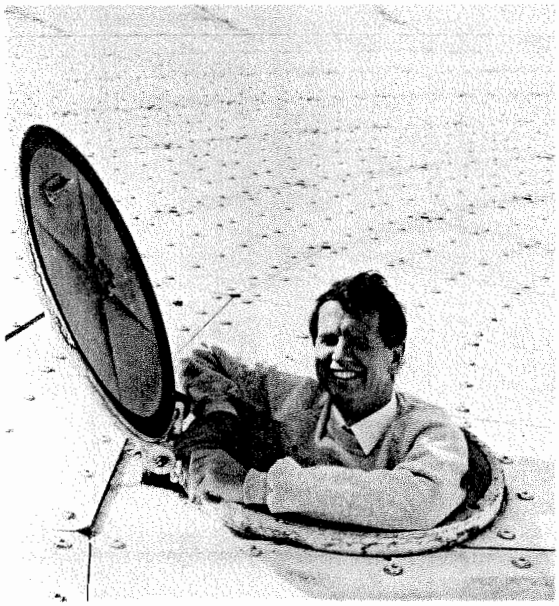
Simon Crean, BEc LLB
Minister for Science and Technology

Born 26 February 1949; educated Middle Park Central, Melbourne High School, Monash University; President Australian Council of Trade Unions (ACTU) 1985–1990; Member Qantas Board 1987–1990, International Labour Organisation (ILO) Governing Body 1986–1990, Economic Planning and Advisory Council (EPAC) 1984–1990, Transport Industry Advisory Council (TIAC) 1983–1990, Senior Vice-President ACTU 1983–1985, Junior Vice-President 1981–1983, Member National Labour Consultative Council (NLCC) 1981–1990, Delegate to Federal Conference Australian Labor Party (ALP) since 1980, Senior Vice-President Victorian Branch ALP Administration Committee 1979–1981 (Member 1977–1985), General Secretary Federated Storemen and Packers Union 1979–1985, Assistant General Secretary 1974–1979, Research Officer 1970–1974; married 17 November 1973 to Carole Lamb; 2 daughters.

S-COR

Popping up everywhere, or *how to get a deeper knowledge of the Organisation*

The rumour that CSIRO has made John Stocker the first beneficiary of a newly perfected cloning technique is unfounded. He's just been moving around very fast visiting Divisions. Now, in addition to making approaches in all directions, he is inviting staff members to come forward with their own suggestions on how he should be visiting them. The photograph below, taken by John Masterson of the Division of Radiophysics, shows him taking a short-cut down from the dish to the control room of the Parkes Radiotelescope.



How do you visit a Division? Much of my time since I joined CSIRO has been devoted to getting out and meeting staff. So far I've visited eight Divisions, but I'm still not sure of the best way to structure such visits. Perhaps there *is* no one 'best' approach, or perhaps some combination of all the approaches I've tried so far would be best.

The 'public forum' method has so far been the one I've used most often, and it seems to work well: I give a talk and then answer questions from staff. This was the method I used when I visited the Parkes Radiotelescope, and some of the questions that were asked there may, I think, prove extremely fruitful.

For example, one question was 'Why don't we institute formal procedures allowing staff to arrange visits in work time for the purpose of getting to know more about other parts of the Organisation?' That is, not just a vague acceptance of the idea that 'we should get around and visit each other more' but standard mechanisms whereby such visits are made not only possible but easy and rewarding. You would send a letter to a Division saying you'd like to visit them for half a day and asking them to set up appropriate appointments with staff members A, B and C, or others they think might be able to discuss matters of interest. Such visits would be allowed for as desirable 'official events' within the Organisation, and made available to staff at all levels.

Another method I've tried is the 'afternoon tea' with a dozen or more staff members. It does seem to help people open up and express themselves freely to have that sort of informal atmosphere where everyone is talking at once; they reinforce each other. This was what we did at Coal Technology, and it led to one of the most interesting discussions I've had with staff so far.

Then there are lab visits, for which I have a special fondness. It's a good feeling at least to *see* the coal face again before being whisked away to 'more important', ceremonial functions. The hands-on work of research is so stimulating; it gives you the chance to ask some deeper questions and get some deeper insights into what actually happens. I can see that I'm going to have to defend myself against getting so bogged down in ceremonies that I'm out of touch with what scientists are actually thinking, in terms of their science, that is – their idea development processes.

Another way of coming at this business of communication is the formal presentation. There was a particularly interesting one at the Division of Soils in Adelaide the other week. They arranged six structured presentations, in each case pairing up the CSIRO person with the industrial partner, representative of the relevant company, farmers' organisation, State Government body or whatever. This showed how CSIRO was relating to them and gave an outside perspective that widened the whole thing enormously, showing the work in its real relation to the wider world. It also meant that these influential people from other groups were able to see more of what was going on in the Division. A genuine case of cross-fertilisation, I think. I was impressed by the structure and very grateful to the people who organised it. David Smiles, Heather Webster, and Ken Lee were some of them, and they did a wonderful job.

Right at the other end of the scale of formality there's a method I'd like to be making more use of, too, and that's the impulsive pop-in, where I see a doorway that looks inviting – be it kitchen, lab, workshop, library or greenhouse – reach out, push it open, and go in. (Oops! Sorry, madam...) I suspect this could lead to some genuine insights, and help me meet a broader range of CSIRO people.

To the fellow staff I haven't been able to meet face to face – and there will always be plenty of those – I want to make it clear that I am keen to hear what *you* think would be my most effect-ive lines of communication. I'm listening...

Letters to the Editor

Dear Editor,

The Operational Plan for 1989–90 stimulated me one weekend recently to have a look at the allocation of funds in what I admit is a fairly simplistic way – funds per capita in the operational wing of the Organisation (the Divisions) compared with the administrative wing (Corporate Centre and Institute Headquarters). I have tabulated the results:

Divisions within Institutes	Appropriation per head of staff $000	Total funds per head of staff $000
IAPP	36·1	59·7
IIT	56·5	69·0
IICT[A]	67·1	80·2
IICT[B]	61·9	73·8
IMEC	49·2	67·0
INRE	53·7	68·5
IPPP	46·4	59·1

[A] = including COSSA; [B] = excluding COSSA

Institute Headquarters and Corporate Centre	Appropriation per head of staff $000	Total funds per head of staff $000
IAPP	141·2	141·2
IIT	300·0	300·0
IICT	435·2	435·2
IMEC	162·5	162·5
INRE	168·8	168·8
IPPP[A]	84·3	84·3
Corporate Centre[B]	75·0	91·4
Corporate Centre[C]		184·0

[A] IPPP declare they are holding $3·3M for allocation to Divisions (not included).
[B] Column 2 includes sponsored research funds.
[C] Column 2 includes [B] and 'Specific-purpose funds'.

There are three comments I would like to make:

1. There is a large variation between Institutes in per capita allocation in both appropriation and total funds, with particularly poor showing of the two rural sector Institutes which serve our major export-earning source. I could accept that this represents the Government and Board view of priorities and is not open for discussion. However, the principle that the more outside revenue is earned the less appropriation money is received is at odds with the push for incentives and staff motivation.
2. Some Institutes appear to be slow in obtaining sponsored research funds.
3. The per capita costs of running the administrative wing of the organisation are extraordinarily large when compared with the operational wing. The Corporate Centre and Institutes' Headquarters cost 7–12 per cent of the total budget, depending on what 'specific-purpose funds' are and how they are used. Is there scope to reduce these overheads or is my view naive and outdated? How do we rank with similar enterprises?

J.E. Vercoe
Assistant Chief
Division of Tropical Animal Production

A Matter of Opinion

This month's opinion comes from John Stephens, President of the CSIRO Officers Association.

In the February–March issue of *CoResearch* this column carried a letter from Bill Godbeer and Ken Riley that suggested, inter alia, that CSIRO Staff Associations were naive with respect to, and/or responsible for, certain adverse developments regarding salaries and superannuation. This required a very narrow reading indeed of the statement 'our young people must be attracted once again to careers in science, technology and engineering', considering the general tenor of the article 'OA campaigns for science' in the 1989 December issue of *CoResearch*.

The Officers Association is acutely aware of the need to protect and improve the salaries and conditions available to scientific and technical staff, surely the primary reasons for its existence. To this end, the OA has been working vigorously over recent years to raise the profile and public appreciation of research and development and the funding thereof. Within CSIRO we pressed for and secured new tenure arrangements to provide better employment prospects, particularly for younger scientists, and we are currently negotiating an award-restructuring salaries package that we hope will go some way towards providing a more satisfactory level of rewards.

Within the ACTU the OA has pushed, virtually alone among unions, for percentage rather than flat-rate salary increases. Indeed we were the union responsible for ensuring that percentage increases were available under award restructuring. We have also taken a determined stand on issues such as the proposed new Commonwealth superannuation scheme, but again without support from other unions, despite the manifest downgrading of retirement benefits that will occur for those participating in the new scheme.

The accompanying table shows the extent of the decline in real wages for various CSIRO professional classifications. That decline has not, however, been confined to scientists, as the figures for the APS fitter show. Indeed, as is well known, award wages generally have declined significantly in real terms over the period of the ALP/ACTU accords.

Nevertheless, at least in recent years, there has been some taxation relief, particularly for higher income groups, as part of the wage/taxation packages under the accords. The accompanying table also shows developments in this regard.

The unfortunate reality is that the Officers Association as a union of 2,500 members has limited impact on the Federal Government, the ACTU, or, for that matter, the shape of the economy. We exert as much influence as we are able to, but it is naive to expect the Officers Association to have been able to do more than it has. Indeed there are people who express surprise at how effective the Officers Association manages to be, given its extremely limited resource base – a General Secretary/Advocate supported by one full-time and two part-time office staff.

Mention should also be made of the fact that the groups that have done well over recent years are those in receipt of non-wages incomes and, generally speaking, occupations that are perceived as making a direct (though not necessarily a productive) contribution to corporate profit. Thus it is the lawyers, the accountants, the financial advisers and the like, who service the deregulated business environment, who have benefited. If an accountant can limit a corporation's tax liability by, say, a million dollars, it is 'worth' paying that person big money.

To merely look at this 'market-driven' excess and argue that scientists (or for that matter people in other 'non-commercial' occupations) should be accorded similar salaries is, however, to ignore the realities of the situation. A market-driven salaries regime for scientists would result in big money for the few who can offer an employer significant financial returns in the short to medium term, but the majority of scientists may find themselves worse off than they are at present in that they may be regarded as commercially marginal. Do scientists really want their salaries set on an individual basis determined by the immediate financial return the person can generate?

The superannuation pension figures contained in Bill and Ken's letter also require comment. Readers may have gained the impression that superannuation pension entitlements have been slashed in the last five years with the aquiescence of CSIRO unions. This is not the case. While not commenting on the accuracy of the figures, the anomaly arises because superannuation pensions are indexed to CPI movements whereas wages have increased at a lesser rate. While this discrepancy continues (and unless offset by other factors such as fund earnings rates or improvements in earned disposable income) there will be a bias in favour of early retirement. This interesting bias must apply much more widely than to CSIRO alone.

In closing let me return to the question of attracting bright school leavers to science. I believe that current government efforts in this direction are futile because they do not address the real issue of providing the requisite career prospects. Ken, Bill and I must therefore be as one here. However, Ken and Bill would do better to direct their ire, as the Officers Association does, at a ludicrously inadequate national research and development effort. They could start by noting all the details of the OA's policy.❖

REAL INCOME & REAL DISPOSAL INCOME 1981–1989[1]

CLASSIFICATION		30/6/81	30/6/83	30/6/86	30/6/89	Percentage change 83–89	Percentage change 86–89
APS fitter (max) ($21 042)*	Income	11 846	12 171	11 712	10 925	–10·24	– 6·72
	Disposal Income	9 306	9 531	9 358	8 631	– 9·44	– 7·77
Experimental Scientist Class 1 (min) ($21 965)*	Income	13 066	12 514	12 256	11 404	– 8·87	– 6·95
	Disposal Income	10 135	9 751	9 730	8 919	– 8·53	– 8·34
Research Scientist (min) ($31 525)*	Income	19 015	18 335	17 958	16 368	–10·73	– 8·85
	Disposal Income	13 853	13 266	12 895	11 897	–10·32	– 7·74
Senior Research Scientist (min) ($39 871)*	Income	24 131	23 417	22 936	20 701	–11·60	– 9·74
	Disposal Income	16 615	16 009	15 484	14 270	–10·86	– 7·84
Senior Principal Research Scientist (min) ($56 420)*	Income	34 264	33 496	32 807	29 294	–12·54	–10·71
	Disposal Income	21 958	20 698	19 432	18 652	– 9·89	– 4·01
Chief Research Scientist Grade 1 ($64 103)*	Income	38 870	38 099	37 388	33 283	–12·64	–10·98
	Disposal Income	23 801	22 540	21 265	20 686	– 8·23	– 2·72
Institute Director ($84 110)*	Income	50 531	50 259	49 321	43 671	–13·11	–11·46
	Disposal Income	28 465	27 404	26 038	25 984	– 5·18	– 0·21

[1] Income less gross tax payable in 1980–81 prices

* Salary levels as at 30/6/89 in 1989 prices

Scientific excellence: a profile

Earlier this year Professor Donald Horne caught the attention of the media by saying 'We need a reshaping of myths. As well as 'The Man from Snowy River', we need 'The Person from the CSIRO'. Well, we certainly have plenty of the right kind of 'person' on hand – scientists of genuine intellectual excellence – but unless we're willing to spend weeks peering at faded files in dusty storerooms it's a little difficult assembling material for the 'myth'. Dr Murray Houghton of the Division of Manufacturing Technology has peered at the files – as yet not too faded – on Dr Graeme Ogilvie, who retired from his post as Assistant Chief of the Division late last year. The resulting scientific profile, with its focus on the detail of a scientist's intellectual adventures, may perhaps provide the sort of raw material needed for a new mythology such as Horne proposes – or at least help to build believable and exciting role models for young people. I'm very interested in reader response on this, and, if that response is favourable, in submissions of more such profiles to be published in CoResearch. Such articles might later be updated and reprinted as a book, or simply as a series of historical monographs of CSIRO scientists. At the very least they would make a useful reference bank.

Graeme John Ogilvie

– an incomplete history gleaned from CSIRO records

Born at Launceston in Tasmania on 23 November 1924, Graeme John Ogilvie graduated from the University of Melbourne as a Bachelor of Metallurgical Engineering in 1946. At the same university he was awarded a Stawell Research Scholarship and obtained a Master's degree in Engineering Science in 1947. In 1949 the CSIRO Executive granted him an Overseas Postgraduate Scholarship, enabling him to gain his doctorate at the University of Leeds in 1951.

Ogilvie joined the Organisation in March 1947 as a Research Officer in the Section of Tribophysics of the then CSIR (Council for Scientific and Industrial Research). His untiring efforts to understand the behaviour of materials, and his contributions to the basic understanding of phenomena, have resulted in real practical benefits for both science and manufacturing industry. His achievements have been in four main areas of science and technology: the nature of ductility, the ion bombardment of surfaces, optical fibres, and the electric arc. His research attributes – an unquenchable thirst for knowledge, clarity of thought, resourcefulness and an ability to identify and carry out successful research of industrial relevance – and his unfailing human qualities, are readily acknowledged by all who know him. These qualities were recognised by the Organisation at an early stage and contributed to his rapid promotion through the CSIRO ranks and his eventual elevation to Chief Research Scientist, a position he held for some years before his retirement in November 1989.

The forties and fifties: ductility

Graeme Ogilvie's first publications show his early interest in physical metallurgy, particularly the wide variation in ductility he observed in certain crystal aggregates. In a pioneering investigation where he was able to remove the constraints imposed by inter-crystalline boundaries, he successfully demonstrated how some features of metals – such as their surface finish and the way they chip – may be affected by the ductility of crystal boundaries.

Ogilvie's boundary research extended beyond metallic materials, and included the non-metallic mineral brucite. It was his fundamental X-ray studies on the texture of brucite single crystals, conducted at Leeds under the supervision of Dr G.W. Brindley, that gained him his PhD.

Dr Walter Boas, Chief of the Division of Tribophysics, thought Ogilvie had the potential to become a top-class researcher in the field of physical metallurgy, and in 1955 he registered the following comments: 'Ogilvie has a deep knowledge in the fields of metallurgy and physics, of which he makes use with great imagination and originality of thought'. At this stage Ogilvie had just developed a new method for heating specimens rapidly on a microscope stage, and this contributed to his reclassification as a Senior Research Officer.

The fifties and sixties: surfaces

By 1957 Dr Ogilvie had initiated research on the effect of positive ion bombardment on to metal surfaces. At that time it was considered important to gain an understanding of the influences of particle bombardment, particularly as there was industrial potential for the processes of cathode spattering (metal coating) and ion bombardment cleaning, and because of the gross damage that particle bombardment inflicted on materials in nuclear reactors. His work centred on ion bombardment treatments of metal surfaces. As Walter Boas noted in 1958 'the work initiated by Ogilvie has now led to a new method of preparation of surfaces. He is a source of enthusiasm and inspiration to those working with him. I think the new field he has opened up will prove very important and have wide implications'.

It did. Three years later Dr Boas was writing: 'This work has become one of our major projects. It is a new field with important applications, some of which have already aroused considerable interest by industry. The progress is dependent on Ogilvie's versatility and his ability to delve into a subject in which neither he nor any of us previously had any experience'.

Among the many insights gained by Ogilvie from his ion bombardment research was his suggestion that a bombarding particle could penetrate much further into crystals than contemporary knowledge predicted. This suggestion, also borne out by work in other countries, is a necessary basis for the understanding of ion implantation procedures used in the production of solid state electronic devices. These devices are becoming increasingly important in the semiconductor industry. By 1962 Walter Boas was able to say 'this comprehensive study has been concluded'. He considered Ogilvie's findings 'of great importance in the theory of radiation damage', and strongly supported his reclassification to Principal Research Officer that same year.

The sixties and seventies: fibres

It had been proposed in 1966 by workers in the field in the United Kingdom that optical fibres could be successfully used for the transmission of enormous amounts of information. However, attempts to realise this potential using conventional glasses for the fibre had been thwarted by impurities in the glass. Ogilvie realised that certain organic liquids, such as tetrachloroethylene, could be relatively easily purified, and could then be used as the core of a low-attenuation optical fibre. But first it was

necessary to design and build a fibre-making machine capable of manufacturing lengths of fibre in excess of one kilometre. Then there had to be a machine that would fill the lumen of the hollow fibre with the filtered pure liquid material. After that the liquid-filled fibres had to be provided with appropriate practical terminals (through which the signals would be conveyed) and appropriate signalling equipment (transmitters and receivers). Ogilvie's triumph over all these obstacles was dramatically demonstrated to the scientific community and media alike when television signals of high quality were transmitted through a fibre one kilometre long. The achievement was recognised by his reclassification to Senior Principal Research Scientist in 1973.

A number of patents resulting from various aspects of Graeme's optical fibre developments were taken out, and these were used as the basis for an agreement between CSIRO and AWA (Amalgamated Wireless (Aust) Pty Ltd) that this work should continue as a joint development. As a result AWA built up a large development team and continued to work in the area. The Australian Post Office was also involved in the development. The CSIRO fibre-making technology was successfully transferred to AWA and incorporated in the design of a fibre-pulling machine. The original fibre-making machine was preserved and later installed in the plant of SGE (Scientific Glass and Engineering Pty Ltd) where it was used to manufacture glass capillary columns for gas chromatographs, an Australian product that is exported worldwide.

But in spite of these achievements and the ever-increasing impact of CSIRO's optical fibre work in the industrial sector, the Organisation itself did not support further development, and by the late 1970s Ogilvie found himself casting about for a new outlet for his research talents. He chose electric arcs.

The seventies and eighties: arcs

As with all his earlier projects, Ogilvie's research into electric arcs – which continued until his retirement in 1989 – has led to a range of important technological achievements, especially in the industry sectors of surface hardening, arc welding and plasma processing.

In 1979 Ogilvie's work in the surface-hardening area resulted in the development of a heat treatment process for hardening the surfaces of metal objects by the use of a tungsten-inert gas arc. This invention was found to be applicable to metallic materials that can be transformation-hardened. The process was protected by patent, and it has a number of practical industrial applications.

Also in this period before the CSIRO Division of Manufacturing Technology was formed in 1980, Ogilvie saw that further advances in arc welding should be possible through an improvement in the control of the welding arc current. Results of some overseas studies suggested that the use of pulsed currents in the welding might achieve the required improvement. However, unless this improvement could be effected in a fairly cheap and reliable product form the market opportunity would not be realised. In 1979 Ogilvie and his Division of Materials Science team – colleagues who were later to transfer with him to the Division of Manufacturing Technology – tried making a new pulse generator for a pulse welder. The early attempt was promising, and some aspects of the research were protected by patent.

This pioneering work became the stepping stone to a joint development project by the Division of Manufacturing Technology and Welding Industries of Australia Pty Ltd (WIA) that later led to the production of a fully commercial pulse welder. A collaborative research and development agreement was negotiated between the parties, with all research decisions to be made jointly. The objective – production of the (fully commercial) 'Synchro-Pulse CDT' (controlled drop transfer) welder – was already realised by October 1983, when the now very successful international product was launched on the Australian market by Senator John Button, Commonwealth Minister for Industry, Technology and Commerce. Apart from the first patent (owned by CSIRO), a number of later relevant patents – jointly developed and owned by CSIRO and WIA – also came out of this collaboration.

The successful development of the CDT pulse welding system depended on three factors: gaining a full understanding of the nature of the metal drop transfer in the arc welding process; developing a very high-speed and high-current switch; and controlling the cycling of the current in the arc so as to achieve a single molten metal drop transfer with each current pulse. Bit by bit, Ogilvie and his team fulfilled these requirements and incorporated them as features in the final easy-to-operate and cheap-to-manufacture industrial welding equipment. Synchro-Pulse CDT became a world leader, offering makers a hefty reduction in welding temperatures, less residual stress, better penetration of weld metal, better control of the welding process, reduced spatter, and a generally improved weld. The original product has undergone successive improvements, while the research collaboration between CSIRO and WIA has continued.

In 1985 the CSIRO Medals were introduced to acknowledge outstanding research inside (and later outside) the Organisation. Graeme Ogilvie was one of three foundation recipients of this award at the inaugural presentation ceremony in Canberra. The final paragraph of his award citation read 'Dr Ogilvie's invention of the Synchro-Pulse CDT and the close collaboration with an industrial partner has provided a model for CSIRO involvement with the manufacturing industry. It is an example which is being followed to assist the survival and growth of Australian manufacture'. More recently, this collaboration was nominated by the Basic Metals and Minerals Processing Industry Council in their 1989 publication 'R & D – a Guide to Successful Collaboration on Industrial Products' as an important case-study model of how future industry/research establishment collaborations might be established and followed through.

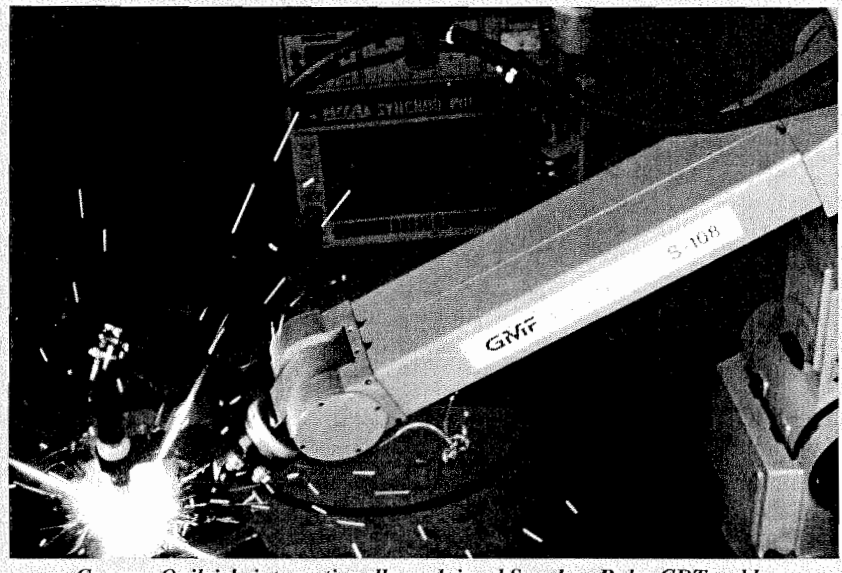
Further achievements were to follow for Graeme Ogilvie during the last half of the 1980s, his final years with CSIRO. During this period he conducted and supervised his own research investigations into the areas of weld seam tracking, the behaviour of lead-acid batteries in motor vehicle applications, and the conception of a high-powered plasma equipment system for processing materials. By this time his responsibilities had also increased. As Leader of the Arc Technics Program, collaborative research activities under his control extended to the Division's Adelaide and Melbourne Laboratories, with projects such as hard-facing, welding electrode development, arc and fume measurement, electric arc devices and plasma processing. When in 1988 the former research program streams of Arc Technics and Materials Technology were regrouped under the title of the Manufacturing Processes and Materials Program, Ogilvie became its Technical Adviser. He held this position, in addition to that of Assistant Chief of the Division, until his recent retirement at 65.

In 1983 Dr Bob Brown recommended that Graeme Ogilvie should be promoted to the highest classification that can be attained by a CSIRO scientist, writing 'Dr Ogilvie is the exceptional research worker who is worthy of reclassification to the category of Chief Research Scientist. His contributions fall into both the area of fundamental scientific investigations and that of technological research – which has had, and is having, very significant practical benefits'. That same year Bob Brown recorded his appreciation of some of those other special Ogilvie qualities that we, his CSIRO colleagues, have been privileged to continue to experience over the many years he worked with the Organisation. Dr Brown's observations included the following: 'As the Assistant Chief of the Division – the position he reached in 1980 – Dr Ogilvie has played an important role in establishing the research facilities at the Melbourne Laboratory, and in the high morale of the staff in that laboratory, and in the effective interaction with industry that has been achieved. However, his greatest contribution is undoubtedly his very fertile and innovative mind. He is a research scientist who has made many original contributions during his career, and he still continues to have a host of creative ideas, which are the key to the success of his own research group, and which stimulate the work of other groups in the Division.'

The nineties: the Post-Ogilvie Era?

Dr Graeme John Ogilvie retired from the Organisation on 22 November 1989, but the outstanding era of CSIRO research achievements in Australian manufacturing – in which he served as a great initiator, contributor and motivating force – has not closed. The Division of Manufacturing Technology now has a well-established practice of engaging in collaborative research with industry partners – very much a legacy of the influence of Graeme Ogilvie's magnificent 42 years with the Organisation – and that practice is certain to continue for a long time to come.

CSIRO – and Australian Industry – say 'Thank you Graeme!'❖



Graeme Ogilvie's internationally acclaimed Synchro-Pulse CDT welder (photo by Helen Niblett)

Ecology and economics – harmony or barney?

The piece below was submitted by Dr Ralph Young, of the Corporate Planning Office, in response to a feature by Barney Foran entitled 'Upping the tempo on the green debate', which appeared in the February–March issue of CoResearch. Barney, who works at the Division of Wildlife and Ecology at Alice Springs, is always one of the more audible and provocative voices in the environment forum, and his February article took the strong line that 'the basic cause of any environmental problem, real or imagined, lies with the economists, their economic models, and their management rationales.' Fighting words, surely, to any economist, and Dr Young isn't taking it lying down.

Judging by his article in the February–March issue of CoResearch, Barney Foran is undoubtedly a good communicator. However, like a number of other scientists he succumbs to the temptation to kick the butts of economists by blaming them for all the perceived ills afflicting his discipline. He then adds some lemon juice to the acid by assigning to economists the responsibility for fixing things up.

What a cop-out! Where have ecologists been all this while? Or do they intend to rely on the Suzukis and Ehrlichs to present their case? If you wish to persuade 'the enemy' to your way of thinking then, short of extermination, it is usually more effective to promote co-operation than to sow the seeds of conflict.

At least as far as economists and the environment are concerned, let me try to set the record straight.

The problems of market failure and 'externalities' (i.e. external effects, such as pollution) have been recognised and analysed by eminent economists ever since Alfred Marshall in 1890, and A.C. Pigou, in 1920, analysed 'sources of divergence' between private and social costs in production. Pigou proposed that a tax be imposed on persons causing such external 'dis-economies'. In other words, an early 'abuser pays' system, whereby anyone whose private gains were causing public losses would be required to make good those losses before he counted up his profits.

Sir John Hicks in the 1940s also dealt with the question of 'spillover effects'; that is, again, external effects. Indeed the practice of taxing polluters is well established in Europe, as Barney acknowledges in his article.

More recently David Pearce and others have been advocating the use of market-based approaches for addressing environmental problems involving externalities – specifically the use of charges and tradeable permits (see his *Blueprint for a Green Economy*). The true costs of environmental 'bads' need to be reflected in market prices to recognise the fact that natural resources such as air, water and soil are not free 'goods'. Indeed I suspect that Barney and I share a good deal of common ground on these matters. Many of the solutions he proposes would have my support.

It is said that if you laid all economists end to end around the world, you still wouldn't reach a conclusion. It should not be surprising therefore that not all economists would endorse an efficiency framework that takes account of environmental costs. That doesn't mean, however, that all economists should be marked with the same brand. Scientists too have been known to have the odd disagreement and paradoxically this is taken to be a sign of health rather than ineptitude.

Another old chestnut re-roasted by Barney is the issue of discount rates. He states that 'discount rates are a major philosophical problem for an ecologist'. Let me ask Barney a question. If he as an ecologist had the choice of taking $10,000 now or waiting five years for the same $10,000, which would he choose?

If like most of us he would choose to take the money now, on the basis that a dollar now is worth more than a dollar in the future, then he too is discounting the future. We do it because we have a preference to 'eat, drink and be merry' now rather than in the future. Mortal lives and finite budgets seem to underlie this time preference – unless we get a reward for postponing consumption. And that is what the discount rate represents – the reward that we require for putting off our pleasures. Just as we are all environmentalists, we are also all economists, having to decide how to allocate limited budgets between consumption expenditure and saving, and, at the same time, choosing amongst a myriad of potential claimants on what we spend.

So it is not a matter of choosing between ecologists and economists or between the environment and the economy; the two are inextricably linked. Barney, like many others before him, has confused the issue. The real issue is the choice between economic efficiency and equity.

The use of positive discount rates in comparing benefits and costs is a means of achieving greater economic efficiency in the allocation of resources (whether funds, people, equipment, or 'natural' resources) among competing opportunities and activities. Economic efficiency does not address the question of equity, and because a positive discount discriminates against the distant future, the question of equity between the generations is ignored. If we are concerned about fairness between generations – and that is what conservation strategies of 'stewardship' and policies of 'sustainable development' are all about – then we are involved in the issue of equity, and this is separate from the issue of economic efficiency.

Indeed, it is more than merely 'separate'; the goals of equity and economic efficiency are often in conflict. The historic record of economic growth has been accompanied by increasing inequity in the distribution of wealth and income among nations, as well as temporal inequity with the growing exploitation and degradation of natural resources. Attempts have been made to reconcile the two goals – for example by arbitrarily reducing the level of the discount rate to lessen the penalty against the distant future – but such steps have generally only made matters worse. Distortion in the allocation of resources will increase, and the accelerated development that comes with an artificially low discount rate will make the unfairness of the distribution of resources between the generations greater, not less.

The conclusion is that efficiency and equity should be addressed separately. With each proposal competing for funding, decision-makers should base their choice on an assessment of the efficiency and the likely effect on distribution of resources, deciding which is the more important in any given case. There is of course evidence that this is already happening: the decisions not to proceed with Wesley Vale and Coronation Hill, and to continue to provide a high level of protection to the textiles, clothing and footwear industries, suggest that equity considerations in these instances received a higher priority than efficiency considerations. On the other hand, a decision to continue logging in certain areas, it could be argued, assigns a higher priority to efficiency.

The analysis of efficiency using, for example, social benefit-cost analysis and natural resource accounting (which in my view is a prerequisite for any policy of sustainable development) should of course take account of all environmental impacts, including non-market ones. The point is that economists already have the 'negative feedback' in their 'perpetual motion machine'; the economic framework to guide decision-making in the presence of environmental 'bads' is in place. Recent examples of the application of this framework include the bio-economic models developed at La Trobe by Dumsday et al, and the MIDAS model used by the West Australian Department of Agriculture. But such exercises cannot be conducted by economists alone. It has to be a collaborative exercise with scientists, including ecologists.

I would therefore strongly support Barney's call to work together, but collaboration is likely to be much more effective if it is conducted in a climate of harmony and mutual respect. Let's forget who is to blame for past mistakes and get down to some hard yakka on what can be done to improve things. Even if David Suzuki is only half right, we haven't got long to get our act together.❖

'...collaboration is likely to be much more effective if it is conducted in a climate of harmony and mutual respect....'

Reviews

David Salt of Education Programs has dug up some more scientific treasure and is again offering a sizeable discount for CoResearch readers.

My first offering is *Fauna of Australia*, an encyclopedic reference on all known land and water animals in Australia, and the second is *The Good Food Show Cookbook*, a simple and inexpensive guide to converting good food into good eating.

Fauna of Australia is a landmark work that will probably become the bible of Australian wildlife. It is a project of the Bureau of Flora and Fauna and will bring together the work of more than 1,000 authors, each a specialist in some area of wildlife. *Fauna of Australia* is not a single book but a series of 11 volumes of which only the first two – 1A and 1B – have so far been published. When complete it will provide a comprehensive account of everything we know of the biology, classification, evolution and history of the animals that live in Australia.

Each volume is devoted to a different group of animals, with Volume 1B examining the mammals, Volume 2 the reptiles, amphibians and birds, Volume 3 the fish, and Volumes 4 to 10 the various invertebrate groups, such as worms, insects, shellfish, crustaceans and protozoans. Volume 1A is a companion to the other volumes and offers some general stories on Australia's many environments, and background on its major animal groups. Subjects covered include the marine environment, evolution of the different animal groups, human exploitation, conservation, and the history of animal discovery in Australia.

Fauna of Australia is not just another coffee-table picture peepshow, but a comprehensive work of reference aimed at scientists, naturalists and university students with interest in the field, and Volume 1A can be used alone as a general reference by anyone interested in Australian nature or wildlife.

On a more homey level, The *Good Food Show Cookbook* may also be of interest to *CoResearch* readers, as it grew out of a CSIRO project.

Last year CSIRO produced a television series – *The Good Food Show* – that aimed to provide simple and practical advice on how to apply the principles of sound nutrition in our daily lives. In its eight episodes it offered dozens of simple recipes that combined good health with great eating. The show was presented by one of Australia's top chefs, Gabriel Gaté, who, as well as being a superb cook, has a strong background in nutrition and is a very appealing communicator. The show attracted a lot of attention at the time and was given glowing reviews.

CSIRO has now produced an inexpensive book of the series that sets out all the recipes created by Gate for the show. Linking the recipes are snippets of background information on nutrition and Australian eating habits.

Special offer to CoResearch readers
(just show this coupon)
Fauna of Australia: Volume 1A: General Articles
normally $44.95
special $33.95

Fauna of Australia: Volume 1B: Mammalia
normally $79.95
special $59.95
(from Commonwealth Government Bookshops)

The Good Food Show Cookbook
normally $6.95
special $5.25
from
CSIRO Publications
PO Box 89
EAST MELBOURNE VIC 3002
Telephone (03) 414 7217

Note: CSIRO staff are entitled to this 25% discount on *all* books from the CSIRO bookshop.

Attention all Sydney conference-goers

Dunmore Lang College provides accommodation and conference facilities on the campus of Macquarie University, 18km from the city centre. For more information and a brochure, contact the Business Manager, Dunmore Lang College, by phoning 02 888 1122 or by writing to PO Box 150, North Ryde NSW 2113

New Awards

Two recently deceased CSIRO microscopists, David Goodchild and John Sanders, have been formally recognised by having awards created in their names. These awards were presented for the first time at the 11th Australian Conference on Electron Microscopy held in Melbourne in February.

The inaugural David Goodchild Award was made to **Dr Michelle Williams** of the Division of Horticulture for her PhD studies on development of the banana fruit, with emphasis on maturity bronzing. Her work, besides demonstrating her considerable skill in electron microscopy, is an example of science interacting with industry to understand a problem, and a fine example, too, of the structure–function research that was so vigorously fostered by David Goodchild himself.

The other inaugural award to be created and presented was the John Sanders Medal of the Australian Society for Electron Microscopy, established to perpetuate the name of John Sanders FAA and to promote excellence in developing or applying electron microscope techniques. It will be awarded biennially.

The 1990 Medal was given to **Dr Peter Tulloch** of the Division of Biotechnology for his pioneering work in applying electron diffraction to determining the structure of proteins. Dr Tulloch has an international reputation in the field, particularly for his work on influenza neuraminidase-antibody complexes.❖

CSIRO invades Armidale Woolexpo, again

...a victory report from the front

by Nancy Mills Reid, Public Affairs and Communciation Manager for the Institute of Animal Production and Processing. The photo below was taken at the Woolexpo by Judith Wood of the Division of Animal Production. Left to right: Sue Donegan and Tony Marjoram (Animal Production) display a computer-generated image of the fertilizer status of Ian Sinclair's Bendemeer property to Mr Ray Chappell (MP for the Northern Tablelands) and Mr Sinclair (MP for New England).

Armed to the teeth with CSIRO posters, leaflets, stickers, reports and bookmarks, twelve mysterious strangers from exotic Brisbane, Sydney, Melbourne and Geelong descended on the prosperous metropolis of Armidale in the heart of the picturesque New England sheep farming district.

Together with ten intrepid local CSIRO volunteers, we had but one thought in mind: to show no mercy, to communicate CSIRO's message to our chosen target audiences, at all costs. And, in Laurie Martinelli's case, to sell a few books.

We stood our ground in the Woolexpo marquee for four long days, from Thursday 29 March to Sunday 1 April, battling the occasional torrential downpour and the hordes of schoolchildren who made up a large proportion of the 40,000 visitors, surrounded by all manner of dog trials, shearing demonstrations, fashion parades (Jenny Kee et al), craft stalls, home-made jams, colorful woolly jumpers and the rabbits and pet fox provided by the local Pastures Protection Board.

Several Divisions and the Bookshop combined to produce a large display in the main tent, featuring the vaccine against blowfly strike being developed by Harry Standfast's Tropical Animal Production group, and the selection programs for worm-resistant sheep developed by Ken Beh and friends from Animal Health. Beside them, local graziers played 'spot the paddock' with considerable enthusiasm as the local Animal Production staff were kept busy with Peter Vickery's popular demonstration using computer-generated images from Landsat satellite data to call up and print maps of individual properties showing their fertiliser status.

In the separate Elders Pastoral 'Back to Back: the Complete Wool Story' exhibition and seminar series, CSIRO was ably represented by Niall Byrne from Animal Health and Barry Hirst from Wool Technology. In the breeds tent, Animal Production proudly displayed the SIROMEAT sheep (a new breed for prime lamb production) and Border Leicesters with the high-fertility Booroola gene.

Meanwhile, back in the main tent, Laurie and his helpers eventually sold about $1,000 worth of CSIRO books while the nearby Animal Health group showed exceptional bravery in branding all passing children with CSIRO stickers.

And the social scene? I am happy to report that we continued in last year's tradition with several very sociable get-togethers organised by the unflappable Judith Wood. Highlights included an 'all you can eat' pasta night and a Chinese banquet complete with Perfect Match floor show provided by a neighboring table of local college students. I also learned that Sue Price and I share a passion for home-made jam, and that Barry Hirst owns 60 woollen jumpers and was having trouble resisting the urge to buy another as a souvenir of his visit to Armidale. What Division is Barry from? Wool Technology, of course.

My thanks to all concerned with the 1990 Woolexpo. Next year's event will be held from Thursday 18 to Sunday 21 April 1991, so get out your diaries and start planning...❖

Apologies to Bill Trahar

Last month's *CoResearch* (issue 331, April) carried a story in this spot entitled 'US honours John Trahar'. This should have read 'US Honours William John Trahar', and indeed did read so before the editor started fiddling about with her new desk-top publishing program to make the headline fit nicely into the space. Mr Trahar, of the Division of Mineral and Process Engineering, was awarded this year's A.M. Gaudin Award by the American Institute of Mining, Metallurgical and Petroleum Engineers for his contribution to the science and engineering of mineral processing.

Some heated exchanges on the exchange of heat?

The Centre for Environmental Mechanics played host to an Elizabeth and Frederick White Research Conference this February at the Academy of Science in Canberra. The topic was 'Geophysics at the Boundaries', and it attracted more than thirty scientists from three CSIRO Divisions, five Australian universities, and two American and two Japanese research institutions.

The meeting was modelled on the Gordon Research Conferences in the United States, which foster lively, critical discussion on recent research by keeping numbers down and allowing generous time for discussion.

One major theme of the meeting was the transfer of energy and matter across the interface between air and water, a topic of interest in the study of climate variations such as the El Nino–Southern Oscillation phenomenon.

Dr Tim Liu of the Jet Propulsion Laboratory at the California Institute of Technology gave the keynote address – a review of turbulent exchange between ocean and atmosphere.❖

Chaos may be trendy, but this more conservative group limited itself to turbulence. The photo above shows participants at the White Research Conference, hosted by the Centre for Environmental Mechanics at Canberra's Academy of Science in February this year.

Invitation to propose topics for the 1991 Elizabeth and Frederick White Research Conference

The Australian Academy of Science invites proposals for the 1991 Elizabeth and Frederick White Research conferences. These conferences are supported by the former chairman of CSIRO Sir Frederick White and his wife Lady Elizabeth. Up to two conferences are funded each year. They cover the physical and mathematical sciences related to the solid earth, the terrestrial oceans, the earth's atmosphere, solar/terrestrial science, space sciences and astronomy. The closing date for proposals is 31 July 1990. Proposal forms are available from the Academy secretariat. Contact Faye Nicholas on 062 475 777 for information.

AUSTRALIAN ACADEMY OF SCIENCE
Ian Potter House Edinburgh Avenue Canberra 2601

***This is* fun?** *Ray Clarke and Graham Old stagger across the finish line during last year's Black Mountain Cup Fun Run.*

The leaves are falling from the trees, the autumn rains have come, and the morning air has a decided chill. These mean only one thing: it's time to start training for the 1990 Black Mountain Cup.

Yes, it's hard to believe, but it's already time to start getting fit again! The Black Mountain Cup, to be held on 20 July in Canberra, is run on a scenic 5.6 kilometre course that does have a few hills, so a month or two of solid training can reduce the pain and put the 'fun' back into the run.

Last year was an excellent one for the BM Cup, with 100 individual participants and 11 teams. The coveted trophy was won by the team from Forestry and Forest Products. It has yet to be won by a non-Canberra Division, though Animal Production and the Lucas Heights Research Labs came close in 1989.

Race organisers are hoping for an even bigger field this year, so if you're keen on running or would just like to have a little social jog, start training.

For more information on the race, please ring Greg Heath on (06) 246 5578 or Will Steffen on (06) 246 5558. The Black Mountain Cup is sponsored by Sirocredit.❖

DON'T FORGET

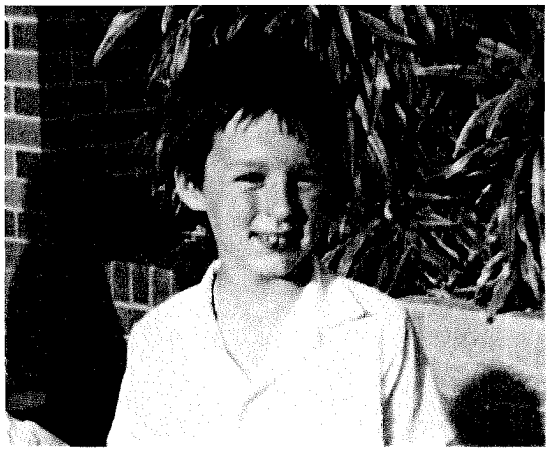
The Print Advisory Service is able to help Institutes and Divisions nationally in the production of printed matter. We can buy on your behalf, using our established network of specialised suppliers, or you may want to use us in an advisory role to help with cost or production strategies. We are often able to provide our own design service, helping CSIRO units avoid the substantial cost of hiring advertising or other agencies.

Our office in Sydney is not staffed, following the recent resignation of Leon Barker. However, we assure our clients, including those in New South Wales, of a continuing service with close support.

Our services are part of the functions of the Information Services Unit. Call us soon.

John Best: 03 418 7321
Jim Quinlan: 03 418 7423
Roy Osborne: 03 418 7376
Kim Greene: 03 418 7442
Fax: 03 417 6125

Double Helix tops 10,000



CSIRO's Double Helix Science Club has just accepted its 10,000th member, Allan Turner, pictured above. Allan, a ten-year-old student at Warrigal Road State School in Queensland, received his membership as a gift from his mother.

***CoResearch* is produced by the Public Affairs Unit for CSIRO staff and interested outsiders. Readers are encouraged to contribute or offer suggestions for articles. Stories may be reproduced, provided acknowledgement is given to both *CoResearch* and CSIRO. The deadline for contributions is the 15th of each month, but earlier is better, as issues fill up fast. Editor: Liz MacKay, PO Box 225, Dickson ACT 2602. Phone: 06 276 6567. Fax: 06 276 6641.**

CoResearch
No. 333 June 1990 CSIRO's staff newspaper
CSIRO AUSTRALIA

Australia Prize: green light for genetic engineers?

In the new Grand Hall of Canberra's new Parliament House on the evening of May 14, a new creature of that new science, genetic engineering, was publicly blessed by the presentation of the *absolutely* new, and very glittering, Australia Prize. The recipients were, reassuringly, old hands. They were Professors Allen Kerr, of the University of Adelaide, Jeff Schell, of the Max Planck Institute in Cologne, and Eugene Nester, of the University of Washington in Seattle.

The prize, worth $250,000, was presented by the Prime Minister, Mr Bob Hawke, who promised that the award would be a yearly event from now on.

The achievement for which the three eminent researchers have been honoured is their breakthrough research into *Agrobacterium tumefaciens*, the bacterium that causes crown gall disease in plants. Professor Kerr's work has produced a genetically engineered microbe that allows farmers to control the disease, which has been estimated to cost the international horticultural industry $140 million every year in damage to stone-fruit crops.

Professor Kerr began research aimed at controlling the disease in 1966. He and his group discovered a benign strain of *Agrobacterium* that produces an antibiotic deadly to other, pathogenic strains of crown gall bacteria, but harmless to itself.

In 1973 Pofessor Kerr's group released Strain 84, as they called it, in Australia as a biological control agent for crown gall disease.

It worked so well that it was adopted in Europe, Africa, North America and South America.

But in 1978 reports came in from Greece that Strain 84 was losing its effectiveness.

In a joint project with a research team led by Professor Jeff Schell, then at the University of Ghent in Belgium, Professor Kerr's group found that Strain 84 was passing its resistance to its own deadly antibiotic on to the disease-causing strains.

Professor Kerr decided to use genetic engineering to perform surgery on Strain 84, leaving it with its ability to produce the antibiotic, but taking away its ability to pass on resistance.

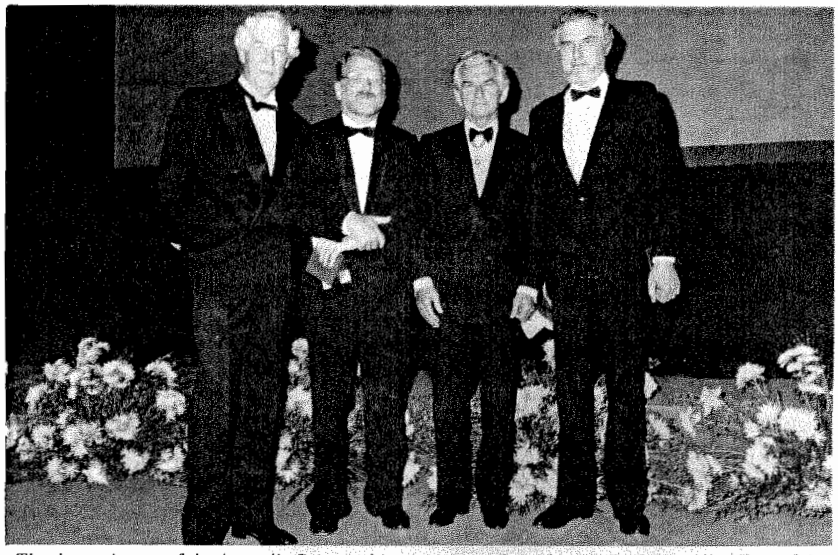
With permission from the Genetic Manipulation Advisory Committee, Professor Kerr performed an experimental field release of the modified bacterium, called Strain K1026, in the grounds of the Waite Institute in June 1987. It was only the third genetically engineered organism to be field tested anywhere in the world.

In 1988, the NSW Department of Agriculture approved Strain K1026 for commercial use as a pesticide, under the trade name NoGall. It can be used anywhere in Australia, but has not been approved for release by countries overseas, where Strain 84 is still being used for control. Strain K1026 remains the only genetically engineered organism released for commercial use anywhere in the world.

Apart from its success against crown gall, *Agrobacterium* has been developed as a genetic engineering vector for plants, and the research of Professor Eugene Nester has been of crucial importance in this work.

Professor Nester and his research team in Seattle have focused on the biology of *Agrobacterium*. By unearthing the genetic events that determine the process of infection it may be possible to help control disease in a much wider range of plant species. Cereals are the main target, but so far only rice has been successfully infected with *Agrobacterium*.

The audience at the ceremony consisted mainly of important and prominent members of the scientific community, including CSIRO's newly retired Chief Executive, Dr Keith Boardman, the current Chief Executive, Dr John Stocker, and the new Minister, Mr Simon Crean, as well as many of our Institute Directors, Board Members and eminent scientists.❖



The three winners of the Australia Prize and its presenter – from the left, Professor Allen Kerr of the University of Adelaide, Professor Jozef (Jeff) Schell, Director of the Max Planck Institute, Cologne, Prime Minister Mr Bob Hawke and Professor Eugene Nester of the University of Washington.

MIS expects $2million annual savings with Fujitsu deal

The Management Information Services Branch (MIS) in Canberra, has signed an agreement with Fujitsu (Australia) for a new Fujitsu M760/10 mainframe computer. MIS estimates that the move from the Paxus Bureau – whose administrative computing services they have been using for the last three years – to the Fujitsu M760 will save CSIRO more than $2 million a year in processing charges.

Greg Batchelor, General Manager of Management Information Services Branch (left), and Neville Roach, Managing Director of Fujitsu Australia, signing the new computer agreement.

Mr Greg Batchelor, General Manager of MIS, said, 'For some time now response times have been getting worse, and our aim was to get mainframe computing services that offered full support as well as hardware and software. We also wanted to make sure we had full control. Our agreement with Fujitsu will ensure that these needs are met.'

Mr Neville Roach, Managing Director of Fujitsu (Australia) assured MIS that customer orientation was an important business strategy for them, and facilities management a 'key strategic area'. 'Both Fujitsu (Australia) and Fujitsu (Japan) are eager to develop a major R&D program with CSIRO', said Mr Roach.

Dr Bob Frater, Director of the Institute of Information Science and Engineering, said, 'We look forward to the joint development program with Fujitsu: it will lead to mutual benefit with Australian industry'.❖

STOP PRESS: Dr Basil Hetzel, former Chief of the Division of Human Nutrition, has been awarded an AC in the Queen's Birthday honours list for his service to Australian and world health.

Stand up and be accounted

About this time the people in charge of preserving administration as we know it are deciding just how much of the next budget bankroll should go to CSIRO. Their decision will be guided by public opinion, their peers, and their own knowledge. John Stocker thinks we should push hard to get ourselves into the ledger at something like our true value.

Communication is a responsibility of every CSIRO member. In support of our upcoming budget negotiations I invite all staff to become involved in an all-out information campaign to demonstrate the value for money Australia derives from its premier research organisation.

As you know, we now have three-year funding, and it is absolutely vital that we retain that, but we can perhaps do even better if the right people get to know just how important our work really is.

By 'right people' I don't mean just the powers on and behind thrones – though I fully recognise their importance – but most emphatically also the person on the street, and on the land.

And communicating that message of our importance is not something I want to do on my own. I want every single member of CSIRO to join me in this. There's a lot of work to be done, and it's a job *worthy* of a lot of work.

The first step I've taken is to create a vision statement for the Organisation. You really can't plan unless you can state clearly and concisely what the Organisation is there for, and this statement will do that. It will be the first stone thrown into the water – the central planning document from which all other plans will take their shape. It will be used, for example, as a touchstone for the research priority-setting that is under way at the moment. I plan to discuss this exercise of priority-setting with you further in my next column.

Once we have a shared vision of the Organisation we can distil from it a set of priorities, and from those priorities, particular projects, and from the projects, tasks.

In a strictly practical sense I also think it's important that such a vision statement be portable and attractive in its form, the sort of thing you can pull out of your pocket during a conversation, and use to give a quick, but impressive and accurate, idea of the Organisation to an interested outsider. We *are* impressive, after all!

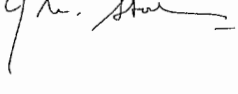
So I'm having it produced in what I hope is a lively, appealing, and *small*, format, with plenty of colour and brief, memorable points. I'll be sending two copies out to every member of staff, one to keep and one to give away. (And you'll be able to get more from me if you need them.)

There will soon also be a second document in support of this campaign. The Communication Working Group is working on a concise statement of CSIRO's contribution to the nation, and it's looking in good shape to be a catchy, interesting brochure.

Again, staff will be able to show it, or hand it out, to people who would like to have a clearer idea of what we are actually doing for Australia.

The Commucication Working Group is also working with Divisions to help me to define particular roles for each staff member in communicating the benefits CSIRO provides.

It's an exciting time. What we are able to achieve now will have effects a long way down the track, for us, and will be of central importance to the future of Australia.❖



Letters to the Editor

Dear Editor,

I would like to make a few critical comments about part of the 'Human Links' document recently published (17 April) by our Human Resources Branch justifying proposed award restructuring. In Section 1. – 'community concern about careers in science' – the claim is made that an increase of 11–16 per cent in the salaries of research scientists will attract more young people into careers in science, compared with, say, law or business.

For the following reasons I doubt this.

1. Jobs. There are heaps in law and business and extremely few in science. Even an advertisement for a technical assistant will attract scores of applicants, most of whom will have degrees or postgraduate qualifications.

2. The assumption in 'Human Links' is that monetary rewards will attract talented young people into science. I suggest that job opportunities are far more important. I would also like to think that it's a genuine interest in science combined with prospective employment in science that motivates students towards it. This, in my opinion, will ultimately be more satisfying for the individual and will produce more creative scientists.

3. It will be a long time before an obvious scarcity of scientists will cause the law of supply and demand to proffer substantially greater salaries; and quite frankly I doubt that it is necessarily what scientists and potential scientists look for. But I am very sure that they look for jobs to practise their profession.

Howard Crockford
Division of Water Resources

Dear Editor,

We have been hoodwinked!

The latest "Careers in CSIRO" pamphlet from Human Resources Branch (January 1990) indicates approximate staff numbers by broad classification. It is interesting to compare these with the numbers in the earlier "Careers in CSIRO" pamphlet published in about 1987. (See table below.)

Note that Research Scientists have suffered a modest decrease while other scientific staff numbers have remained about the same. My concern, however, is the almost 250 per cent increase in administrative staff!

As P.H. Langhorne assured us that the restructured Corporate Centre would require considerably fewer staff *(CoResearch*, February 1989), I can only assume that this significant increase in administrative staff was necessary to permit divisions to handle the additional responsibilities devolved from RAOs and the former CSIRO headquarters. Where are the savings???

Ross W. Hansen
Division of Tropical Crops and Pastures

Dear Editor,

When I was a boy, science meant flying faster than sound, sending satellites into orbit, generating nuclear power and producing goods without human workers. Nowadays science means clearing up the mess made by unsophisticated people who have been let loose with the great powers made possible by science.

This affects how people regard science and research. Progress is more stimulating than damage control.

Medicine improves, and people respond with a population explosion. Better ships are built, and people respond by threatening fish stocks with drift net fishing. Roads are built into the Amazon, and people respond by burning down vast tracts of forest.

Social problems are now more important than production problems. Organisations such as CSIRO are not able to solve social problems.

The long term future for any successful advanced society is stagnation at a very high level of wealth. An automated economy will generate enormous but stable output to be distributed among a small and stable population. This is the only workable formula.

Sophisticated societies are fragile structures, easily disrupted by unsophisticated people. The main research problem now is not in industry or agriculture, but in defending sophisticated society from hillbilly demands for ever-expanding populations and economies.

David Erskine
Division of Water Resources

Classification	1987	1990
Research Scientists	1500	1400
Experimental Scientists	1250	1250
Other Professional Staff	220	230
Technical Staff	2050	2300
Laboratory Craftsmen (some now translated to Technical Staff)	400	100
Administrative Staff	450	1150

Note: one more letter appears on page 6.

A Matter of Opinion

Back in March this year CoResearch No. 330 carried an outspoken attack on economists from Barney Foran of the Division of Wildlife and Ecology at Alice Springs. It was called 'Upping the tempo on the green debate', and it certainly did, eliciting a spirited full-page response from Dr Ralph Young of the Corporate Centre, entitled 'Ecology and economics – harmony or barney?'. (See last month's CoResearch, No. 332.) The tempo is still well up, it seems, with the arrival this month of an energetic reply to the reply. Dr Trevor McAllister of the Division of Materials Science and Technology at Clayton, writes: 'Having read both Barney Foran and Ralph Young in recent issues of CoResearch, I cannot resist contributing to their dispute. The enclosed is based on an Ockham's Razor talk I gave for Robyn Williams on ABC radio last year, and on a conference paper given to the Ecopolitics IV meeting in Adelaide last September.'

Ralph Young calls Barney Foran's attack on the economics profession (February–March *CoResearch*) a 'cop-out', a description that I interpret as meaning 'you're to blame for my faults'. Yet this is the very attitude of the mainstream economics profession towards not only science, ecology and the environment, but the rest of society – that is, the people who actually make up the theoretical concept of 'the economy', and who, to the economists' repeated embarrassment, simply don't conform to their economic dogmas. Deregulation has been a manifest failure for the Australian economy, yet no economist in a position of authority is prepared to admit that it was wrong. Instead they blame the victims – ourselves.

Of course one can, as Ralph Young does, quote a list of economists who expressed at the very least disquiet about free market economic theories, if not those who actually have tried to persuade their colleagues to an alternative view. As well as Marshall and Pigou, one can go all the way back to Adam Smith himself, then forward to mention Karl Marx's theory of labour value, Thorstein Veblen's theories of conspicuous consumption and economic value, Keynes' witticisms on the subject of free market equilibrium and the malign influence of economic theory on politics, Meadows on the idea of limits to growth, and, more recently, Herman Daly's concept of steady state economics, and David Pearce's attempts to quantify the hidden costs in markets.

We should also not forget the efforts of Marilyn Waring to quantify the household economy and the unpaid work done mostly by women in our society, which doesn't get counted in the male-dominated official GNP but which contributes at least half of the wellbeing of our society.

This list of distinguished dissenters, however, does not excuse the economics profession from its responsibility for the increasing materialism of our society, and the danger that the sheer material throughput of the system, driven by archaic market theories wedded to the ideology of growth, will destroy what decent environment we have left.

The bulk of the economics profession, its practitioners in governments and businesses, don't think like Daly or Pearce or Meadows or Waring. Their intellects are trapped in the simplistic concept of Marshall's free market curves, a theory that is now a century old and was conceived in a society quite different from ours. To take an analogy, it is as though in science we had ignored the quantum and relativity theories and persisted with classical Newtonian physics as the sole means of describing physical phenomena.

A century ago science faced mounting evidence that Newtonian physics, a philosophy of continuously varying forces producing continuously varying results, was inadequate to explain all natural phenomena. Economics is in a similar philosophical position today as it tries to ignore the evidence from environmental degradation and social disruption that its classical free market theory is inadequate. The problems in science were finally overcome by adopting what amounts to a duality of theories – the quantum and relativity theories are used to explain atomic events, and Newton's laws are retained to explain the motions of large bodies.

You don't have to be a scientist to experience this duality – everyone does, every day, when they travel to work, school or the shopping centre by what we might term 'Newtonian' means, but also when they use telephones, television sets, computers and other devices containing solid state electronics that are understandable only in terms of the quantum theory.

The minimum prerequisite for the genuine co-operation between scientists and economists desired by Ralph Young is that the economics profession update itself intellectually and adopt a similar duality of economic theories. It can keep its sacred markets for the distribution of goods, but in addition it needs to adopt a theory of limits, philosophically similar to the quantum or relativity theories, which sets a limit to the material throughput of the economic system, a limit the environment can handle. This approach has been expounded best by Herman Daly in his book 'Steady State Economics' (1977)

It is not enough to tackle environmental problems in a piecemeal, market-by-market approach, involving pollution taxes or other devices to assign the invisible costs of production to their sources. Economic efficiency, a term much used by Ralph Young in his answer to Barney Foran, should be redefined to include measures of equity and environmental degradation, rather than being seen as opposed to them. In this sophisticated age that is surely the least we can expect of a profession that provides most of the policy advisers to our decision-makers.

When I was a postgraduate student in Chemistry, my supervisor was much taken with the idea of precision. So much so that we, his students, coined our own definition of precision: the art of being accurately wrong'. As for precision, so for efficiency in traditional economic terms. It can too easily end up as 'the art of being economically dead'.

❖❖❖

... and of international policy?

The amount of fierce argument in recent issues of *CoResearch* suggests a widespread and sometimes even passionate interest in environmental economics. The main focus has been on whether we should, and how we could, build the costs of environmental damage into our national accounts.

Well,it looks like someone has been slipping copies of *CoResearch* to the Australian Bureau of Statistics, because at the back of its most recent issue of *Australian National Accounts* (that's the 1990 March Quarter edition, No.5206.0), there is a seven-page feature article called *Natural Resource and Environmental Accounting in the National Accounts*.

The article considers the criticisms put forward by environmental economists, and others, of the present methods. Some of the alternative approaches that have been suggested are examined, and 'possible future developments in accounting for environmental factors in the Australian national accounts are also outlined'.

There was neither time nor space to offer even a condensed version of an article that itself barely scratches the surface, but we thought a few serum samples from those scratches might be of interest –

'The international standard for national accounting is the United Nations' *A System of National Accounts* (the SNA), issued in 1968. The Australian national accounts are based on this system.'

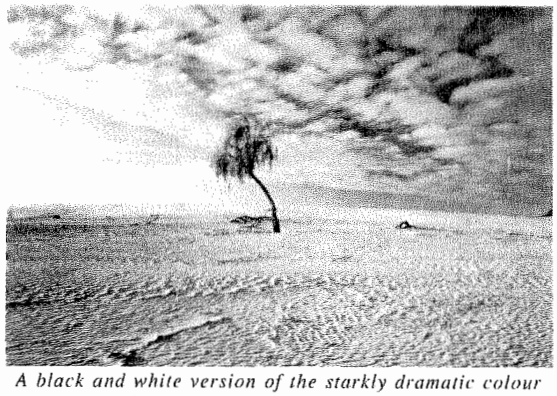
'The principal exclusion from [SNA] balance sheet accounts relates to resources in the public domain which are not subject to ownership rights and thus generally not sold or purchased (e.g. rivers, lakes, parklands, unused wilderness and the atmosphere).'

The article outlines historical changes in the definition of national income, and refers to 'sustainable or "true" income, as defined by Adam Smith and later by Hicks' – noting a movement away from their concept in national accounting. It discusses the problems of assessing degradation and depletion of natural resources and mentions the 'depreciation approach' and the 'user cost approach' as available alternatives. It also devotes some space to 'defensive expenditure' – defined as 'expenditure ... made to compensate for, redress or guard against losses of environmental functions relating to land, air and water'.

'The SNA is currently undergoing an intensive revision. ... It has already been decided that no major conceptual changes should be introduced. ... However, a consensus has emerged ... that enough progress has been made to link environmental accounting to the 'core' of the SNA by means of 'satellite accounts'. ... The view ... is that further consideration could be given to adjusting the core of the SNA once adequate experience has been gained and when various conceptual and valuation issues have been resolved. ... A 'Draft Framework' for a proposed set of environmental satellite accounts was presented at the Twenty-First General Conference of the International Association for Research in Income and Wealth in August 1989'.

The article ends by saying 'The ABS ... recognizes the growing need for a comprehensive means of assessing whether or not the current rate of economic development is sustainable in the longer term. The ABS is planning to ... put further effort into improving the statistical measures available on Australia's natural resources and environment.'

Interesting, in a legalistic sort of way, isn't it? If it isn't in your library yet, call Margie at the Corporate Centre Library, or me at CoResearch, and we'll get a copy off to you.



A black and white version of the starkly dramatic colour photograph of Lake Mungo taken by Jaime Plaza van Roon in 1989. (Posters are available: see Science for Survival, *page 5.)*

Dieter Plate spins a good yarn ...

In 1988 Dr Dieter Plate of the Division of Wool Technology won the Sir Ian McLennan Achievement for Industry Award for his development of the SIROSPUN process, a technique that allowed the spinning industry to produce twice the quantity of two-fold yarn from a given number of spindles, as well as solving the problems caused by the breaking of strands during spinning. Part of the Award is an overseas travel grant of up to $10,000 for study related to the winning industrial innovation, and Dr Plate has agreed to tell CoResearch readers something of his tour of European spinning centres.

The travel grant that came with the Sir Ian McLennan Award provided an excellent opportunity to visit spinners and machinery manufacturers in Europe. This was also to be the first time that my wife would accompany me on an overseas trip after something like 50 weeks of solo travel for CSIRO. With that and the itinerary I had planned, it really was a trip to look forward to. Discussion points on this trip were to be not only Sirospun, which after all was launched 12 years ago, but also new spinning initiatives in general including a number of more recent CSIRO developments.

The greatest part of my time was going to be spent in Germany because that is where, in general, the most technically advanced processors are. If our research is truly to push forward the technological frontiers of wool processing, then we must know what the most advanced sectors of the industry are doing and thinking and what they see to be their future problems.

The trip started with the 'Joint R&D and IWS Technical Managers' Meeting' in Ilkley in Yorkshire. This is an annual meeting to bring together the R&D and industry contact arms of the wool family and is an important source of information to aid in our strategic planning. Ilkley, the gateway to Upper Wharfedale, is a beautiful part of the world, and the weather went out of its way to make us welcome. Fortunately, we found some English country pubs.

From Ilkley we went across to Munich where I visited the Augsburger Kammgarn Spinnerei, one of the major worsted spinners in Germany. This was my first visit to this firm, but the work of our laboratory is well known in Germany and the doors of industry are always open to us there. I was met by the Technical Director and Quality Control Manager and had a very interesting and informative day. There was just enough time left for a quick walk around the old town of Augsburg before catching a train back to Munich to meet up with my wife, who had spent her day visiting the castles of mad King Ludwig.

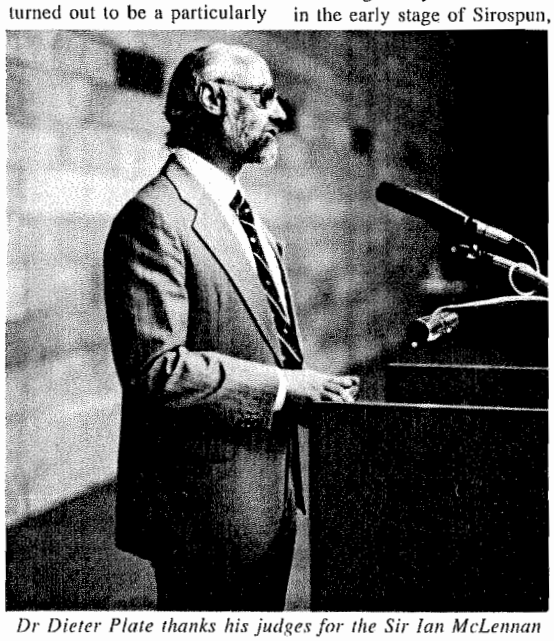
Zurich was next, where I visited two manufacturers of yarn quality control equipment. We had been negotiating with one of these companies (through the services of IWS) to commercialise our latest development to remove coloured faults such as pieces of vegetable matter, which are unique to wool, from yarn during winding. This was an excellent opportunity to make personal contact and judge their capabilities.

Licence agreements have since been signed and development is well under way. Two visits to spinning mills, one in Switzerland and the other in the north of Italy, followed. The Italian mill was going to be the venue for the first industrial evaluation of our yarn clearing device. They specialise in "white" yarn production, much of which goes into wool underwear, at the top end of the market of course. In this, of all markets, individual stained fibres in the fabric are considered a problem, even though they are barely visible. Our device was sensitive enough to detect them and created considerable interest in this firm. They now want to be the first customer to buy the device when it comes on the market. On the personal side we did find some time to take in the beautiful Swiss mountain scenery and to visit the glorious cathedral in Milan. Again, the weather smiled on us all the way. It must be my wife's influence.

From there it was back into Germany, first to Stuttgart for a visit to our Sirospun licensee Zinser, who are now the major manufacturer of long-staple spinning machinery in the world. They are currently trying to introduce Sirospun to the short-staple spinning industry. The advantages here are nowhere near as clear-cut as they are for wool, but the potential market is huge. Sirospun is on first appearance a very simple idea, but it is very difficult to understand the actual mechanism of yarn formation. The textile industry knows that it works, but not how, and even Zinser were no exception. I was amused to find that their current advertising brochure for this process still makes claims that are not strictly true and demonstrate a complete lack of understanding. I obviously did not miss a vocation as a teacher because I tried to disabuse their engineer of this idea some ten years ago. While in Stuttgart I also visited the Textile Research Director of SKF for a discussion on new spinning initiation. We had a lot of common interests and this turned out to be a particularly interesting meeting.

The next step was Bremen for discussions on early stage processing with arguably the leading top-maker in the world and then on to Dusseldorf, into the heart of textile country in Germany. I met up with a colleague to visit Henkel to discuss our work on carding and spinning lubricants, which has been a real bonus to them, unfortunately without any return to us (but considerable benefit to the wool processing industry). At least it guaranteed us a good reception and very interesting and useful discussions with a large cross-section of their staff.

The most interesting, if not most pleasant, visit on this section was to one of the leading manufacturers of fine wool worsted suitings in the world. The bulk of their production is Sirospun and obviously they were experiencing some problems because for the first hour I had to sit through a tirade from the manager about the uselessness and inefficiency of the process that I had lumbered him with. I sat through many similar tirades in the early stage of Sirospun, but I can't say that I ever got to enjoy them. I have found that the textile industry even in the most developed countries like Germany, still appears to have very little of that automatic inquisitiveness to look for cause and effect that tends to result from a scientific upbringing. The fact that another 180,000 spindles elsewhere in the world were apparently running quite satisfactorily, did not appear, even for a moment, to suggest to him that the fault might perhaps lie in his own practices.



Dr Dieter Plate thanks his judges for the Sir Ian McLennan Achievement for Industry Award, on behalf of his team as well as himself. Photo by Neville Prosser, Division of Forestry and Forest Products.

Fortunately, this visit was balanced by our visit to Schlafhorst, who are one of the leading textile machinery manufacturers in the world and our licencee for the 'Thermosplicer'. This was a development that was triggered by early problems with the joining of Sirospun yarns during winding. It greatly improves the reliability of splices in wool yarn and is now the acknowledged industry leader. Due to incompatibility in design, Schlafhorst was not offering it with their latest model of winders, but I learned that industry pressures had forced them to redesign the splicer and it will in future be offered on all of their winders.

Our trip finished in that beautiful old University town, Aachen, which is actually not as old as it looks. Most of those buildings that look centuries old are in reality less than forty years old. They were lovingly reconstructed using old plans, stone by stone, from the rubble left after World War II. Here I visited the German Wool research Institute and the Textile engineering department of the Aachen Technical University. I have always envied this department its close contact and interaction with the German textile machinery manufacturing industry. It provides a relevant and excellent type of training which unfortunately would be difficult to copy in Australia.

These visits concluded a fairly hectic but extremely interesting four week itinerary for both of us. My wife's trip was made particularly enjoyable by the amount of effort that was made by the various firms I visited to take her sightseeing. She certainly never complained of feeling lonely or neglected. For me it was a very pleasant conclusion to what has overall been a very satisfying experience, the award of the Sir Ian McLennan medal. ❖

New Staff at Maths and Stats

The Division of Mathematics and Statistics has acquired three new staff members and would like to use the pages of CoResearch to introduce them to the rest of CSIRO. CoResearch is delighted, and would be happy to receive more such submissions; it all helps to bridge the distances – intellectual and geographical – that separate us.

New arrivals at the Division of Mathematics and Statistics: left to right, Dr Chin-Hsien Li, Wendy Lloyd-Jones and Dr Matthew Yiu.

Chin-Hsien Li has been appointed as a Senior Research Scientist in the Applied and Industrial Mathematics Program in Sydney.

Chin-Hsien brings considerable experience to the Division. He received his first degree in Mathematics from the China University of Science and Technology in 1967. After that, his career was profoundly affected by the cultural revolution: he was forced to serve in the provinces for ten years, first as a farm labourer and then as a school teacher.

In 1979, following the purge of the gang of four, Chin-Hsien was offered the chance in 1979 to do a PhD at Oxford. His thesis was on the use of finite element methods to solve moving boundary problems.

After completing his thesis in 1982, Chin-Hsien returned to China where he worked in the China University of Science and Technology in the area of free boundary problems and oil reservoir modelling.

Immediately before joining the Division Chin-Hsien spent about six months working for a Boston company funded by venture capital, but has now opted for the greater security offered by an appointment in CSIRO.

Wendy Lloyd-Jones graduated from the Kuringai College of Advanced Education in 1980 with a Diploma of Education. She worked in the legal profession before joining the Division of Mathematics and Statistics to provide secretarial assistance to research staff at Lindfield.

Matthew Yiu was born in Hong Kong and received his primary and secondary school education on the island. After completing his secondary education he attended a college of education and trained as a mathematics teacher for junior secondary forms. He had one year's teaching experience before moving to the University of Lancaster in the UK in 1982 to do undergraduate study in mathematics and statistics.

Fortunately for Matthew his undergraduate studies gained him the British Gas Research Scholarship for doctoral studies from 1984 to 1987. After successfully completing his doctoral studies he joined the City Polytechnic of Hong Kong as a lecturer in the applied mathematics department.

For his doctoral degree he studied recursive time-series with application in ground probing radar signal processing, and incidentally invented a new method of finding buried pipes that has been found to have commercial potential.

In February this year he spent time at Bond University working on the long-term prediction of foreign currency exchange rate problems for the World Value Company.

Matthew has joined the Division as a Research Scientist with the Signal and Image Analysis Program.❖

Attention scientific staff. A range of grants is being offered, through the Academy of Science in Canberra, for scientific exchanges with the U.K., France, Japan and China. Most of the grants are for researchers in the broad field of natural science, but a few are for those working in mathematics, engineering science, non-clinical medical research and the scientific research aspects of psychology, archaeology and geography. Some deadlines for applications are as early as 1 July 1990, so it's probably better to phone than write for details. Call Bonnie Bauld on 06 247 3966.

'Science for Survival'

goes on tour

CSIRO and Sydney's Powerhouse Museum – the largest and most successful museum in Australia – have joined forces to produce an intriguing hands-on exhibition of CSIRO's environmental research. The exhibition wet its feet in Sydney, but was officially launched by Dr John Stocker at Canberra's popular new Science and Technology Centre on May 15.

Dr Stocker said that science was essential to the task of reconciling conflicting interests where the environment was concerned, and that CSIRO was positioning itself to be just the sort of unbiased, impartial arbiter that would be needed.

'Quite often', he said, 'CSIRO's is the only voice of reason in a sea of irrational, emotive comment about a development proposal.'.

(However, he did admit that might be the sort of praise you'd expect from a chief executive, especially one who was 'a little green'.)

The major themes of the exhibition are Air, Earth, Fire and Water, presented in imaginative, interactive displays. Visitors see living 'test-tube trees' designed to survive in Australia's salty soils, wetland plants that treat sewage, and live termites in the very act of improving soil quality. They also get to press a multitude of buttons with various more or less amazing results.

The 72 square metre exhibition includes such CSIRO-developed technologies as –

MICROBRIAN – for analysing remotely sensed data;

AIRTRAK – for monitoring air pollution;

SIROFLOC – for making water drinkable; and

CLIMEX – for predicting effects of climate change on insects and animals.

The exhibition will be in Canberra until June 24, and then goes to the Museum of Victoria in Melbourne from July 6 to 19; and the South Australian Museum in Adelaide from August 30 to October 21. From then on the dates are less fixed, but roughly they are as follows: the Scitech Discovery Centre in Perth – November 1990 to January 1991; the Powerhouse Museum in Sydney – April to May; and Newcastle and Wollongong (at sites yet to be arranged) – June to August.

The exhibition was organised by the Institute of Natural Resources and the Environment and the CSIRO Public Affairs Unit. The Institute is selling a striking colour poster, featuring a photograph by Jaime Plaza van Roon and titled simply 'Science for Survival', for $5. (See page 3.) CSIRO staff can get the same poster for $3 by calling Wendy Parsons on (02) 276 6615.❖

The Science for Survival exhibition at its official launch in Canberra. Photo by Julie Faulkner of Plant Industry.

New Aerospace Optics Facility

On May 7 the Division of Materials Science and Technology opened a new aerospace optics manufacturing facility at its Clayton Laboratories in Victoria.

The Division is building on one of its traditional strengths in optical instrument development, which began in the 1950s when Dr Lloyd Rees, the foundation Chief of the Division of Chemical Physics, appointed John McNeill and Charles Alldis to establish a strong optical instrument design and manufacturing capability. This was the beginning of a great period in Australian science, which saw the development of optical instruments for chemical analysis by the atomic absorption technique invented at the Division by Sir Alan Walsh. This method is now in use all over the world.

Diffraction gratings, lenses, mirrors and many other optical components were all produced to support the emerging scientific instrument industry.

Today this tradition forms part of the foundation for a new industry – aerospace optics.

CSIRO is again in the vanguard with the official opening of its new aerospace optics facility by Dr Colin Adam, Director of the CSIRO Institute of Industrial Technologies.

In his address Dr Adam pointed to the pivotal role that the new facility is destined to play in the modern era as a centre for developing optical instrument packages crucial to Australia's future remote sensing, weather forecasting, and environment and resouce monitoring needs.

In combination with the Division's well-equipped instrument workshop, the facility provides a fully integrated optical engineering capability ranging from detailed optical and opto-mechanical design, structural and thermal modelling to in-house optical and mechanical component manufacture, thin-film coating and final assembly, integration and testing. Two of the most important technical features mentioned by Dr Adam were clean areas for the polishing and assembly of optical components to meet strict aerospace industry standards, and provision to polish toxic infra-red optical materials safely.

A second-stage expansion of the facility is being planned to allow for the extension of the present building. This is to accommodate a large optics manufacturing capability in association with the Melbourne firm, James Optics Pty Ltd. This will make possible the polishing of astonomical optics with a diameter in excess of 1.8 metres.

Dr Adam wound up his address by naming the new facility the 'J.J. McNeill Optics Laboratory' after John James McNeill (1916 – 1980), to honour his outstanding contributions to Australian optics.❖

Left to right, Max Sawatski, Deputy Department Secretary, ACT Department of Education, Ross Kingsland, Manager, CSIRO Education Programs, and Dr John Stocker, Chief Executive.

Student Research Scheme

This year's Student Research Scheme was officially launched by Dr John Stocker at the Corporate Centre in Canberra on the evening of May 8.

The scheme is organised jointly by CSIRO and the ACT Department of Education . It allows selected senior secondary students to undertake research projects under the supervision of practising scientists from the ACT Administration, the Australian Defence Force Academy, the Australian National University, the Bureau of Mineral Resources, the University of Canberra, and, of course, CSIRO.

Dr Stocker told the students that the scheme would provide them with a balanced experience of research 'with both the brickbats and the bouquets that it has to offer'.❖

– an open letter to Dr Stocker

The following was sent to Dr Stocker as an 'open' letter, with the request that it be published in CoResearch.

Dear Dr Stocker,

I have just attended a seminar given by Mr Fenwick of CSIRO's Corporate Centre, outlining proposals for modification of CSIRO's salary structure. I was not impressed. The cost in operational efficiency of the scheme (such as it was) would be considerable and the tactics used ('adopt this quickly or we will miss out on pay rises') was unworthy of an officer in his position.

In my 25 years in this organisation I have found that the most successful and productive research groups are those that operate as a team, with all levels, from SRS to TA, sharing all aspects of the work. By knowing each other's skills and weaknesses, everyone can act to achieve the best result with the resources at hand.

It is quite obvious that Staff Section has made no attempt to find out how research groups work. Their proposals will have the direct effect of driving a wedge between project leaders and those who have to design and carry out the work. In encouraging science 'managers' to spend more time 'conceptualising' and less time at the bench, the proposal will enhance an existing trend for research leaders to become so divorced from the realities of bench or field science that their staff have to 'rewrite' their objectives before they can be achieved at all.

It seems a worthy aim to reduce the number of classifications in the Organisation. But please, let's do it by grouping all the productive people in one category and the managerial/administrative people in another. The performance criteria, skills, and temperament of those two groups are far too different to even consider mixing them up.

At some stage, those promoted from bench science to management roles will have to formally recognise that their aspirations are in management. Already, far too many people claim to be scientists but have had little or no personal experience of bench science for many years.

If CSIRO is to meet the Board's objectives then those who have the interests and skills to solve scientific and technical problems must start to get SUPPORT from those whose job it is to keep the administrative machinery running smoothly. I hope that you can put a stop to this fiasco before it is too late.

Cliff Hignett
Division of Soils

Joined up in 1943 – still going strong

The anniversary of Stan Shenstone's commencement with CSIRO was marked by a presentation by his colleagues at the Food Research Laboratory of the Division of Food Research. Stan is currently CSIRO's longest-serving officer still in active service.

To mark his 47th anniversary of continuous service, most of which has been in egg research, Stan was presented with 48 eggs by his colleagues – one for each year of service with one spare in case of breakages. To sweeten the surprise presentation the eggs were chocolate.

Stan began work on 27 April 1943 at the princely salary of £96 per annum. What price award restructuring then? To make matters worse he worked a five and a half day week. What? No flextime?❖

Apologies from the editor

On the front page, no less, of last month's *CoResearch*, No. 332, I managed to fail to credit *two* CSIRO photographers.

The top picture, of our new Chief Executive, Dr Stocker, greeting our new Minister, Mr Crean, was taken by Julie Faulkner of the Division of Plant Industry in Canberra.

The bottom picture, showing our old Minister, Mr Jones, unveiling the plaque commemorating CSIRO's new supercomputer, was taken by Helen Hutchinson of the Division of Manufacturing Technology in Melbourne.❖

Running late?

The Black Mountain Cup is only one month off. Get your legs, hearts and lungs in action (and turn off your brains?). Enquiries and entries to Greg Heath on (06) 246 5578 or Will Steffen on (06) 246 5558.❖

Vale Wally Hastie

Wallace George Hastie, Associate of the Royal Photographic Society, former President of the Institute of Photographic Technology, member of the Motion Picture and Television Engineers, and Life Member of no less than four diversely different organisations, finally lost his battle with a long illness on November 24, 1989, aged 71 years. Thus ended a most extraordinarily busy life.

A young contemporary of the earliest members of the Division of Forest Products, Wally joined the former Council for Scientific and Industrial Research in 'the stables' of the Head Office in Albert Street, East Melbourne, in 1933. When the Division moved to the new building in Yarra Bank Road, South Melbourne, in 1936, Wally's duties increased and he undertook courses in cabinet-making, wood machining and engineering drawing, rapidly becoming so indispensable in the testing of timbers for aircraft construction that he was granted exemption from military training in 1939.

His interest in aircraft had developed earlier. He was a model aircraft enthusiast and in a competition he won the first model aircraft engine to enter Australia. He later created a world record for the longest flight of a model aircraft, from Melbourne to Camperdown – some 200 kilometres. In these early years he had already flown the Gypsy Moth on Coode Island, so it was perhaps inevitable that he should at last claim release from his 'reserved occupation' to enlist in the RAAF in 1942.

Competent and thorough in all things, Wally completed his flying course under the Empire Air Training Scheme in Canada, becoming first a pilot instructor, then serving in Coastal Command, and ultimately in Transport Command in England, Gibraltar, Africa, India and Burma, where he was forced down and captured briefly, but escaped with his crew in a stolen Japanese aircraft. The necessity to kill the guard remained on Wally's conscience to the end.

Returning to the Division in 1946 he gradually became more involved in photographic work and undertook a course of photography at Melbourne Technical College. By 1948 Wally's diligence and 'natural mechanical ability in relation to photography in research' was noted, and he was put in charge of the Division's Photographic Section. His photographic reproductions in many of the world's leading scientific journals were without peer.

Wally revelled in the more difficult assignments and his versatility and ingenuity in high-speed cinephotography earned him an enviable reputation inside and outside the CSIRO. A few of his successes were to capture the operation of a captive bolt gun paper-sampler for Australian Paper Manufacturers Ltd, bubble movement in flotation processes for the Division of Industrial Chemistry, and high-speed cutting processes such as in chain sawing. His advice and expertise were sought by, among others, Government bodies such as the Aeronautical Research Laboratories and the Atomic Energy Commission.

In 1955 Wally achieved another distinction: he became the first member of CSIRO to be admitted as an Associate of the Royal Photographic Society of Great Britain.

Former staff will remember that Wally, always busy, never failed to help members questing in the field of photography, whether it was the Chief or the cleaner.

Upon the demise of the Division of Forest Products Wally transferred to the Division of Building Research at Highett and there virtually began a new career. With the same energy and enthusiasm always characteristic of Wally he tackled a three-year course of photolithography at the School of Printing and Graphic Arts, and was one of only four who graduated out of an enrolment of 106. He was probably unique in being litho-camera operator, large-scale negative maker, opaquer, negative stripper, dot etcher and plate maker – all tasks normally undertaken by specialists in the printing trade.

He was almost certainly unique in being also the Division's projectionist, theatre manager and sound engineer for the audio-visual units and associated video equipment, which he installed upon the failure of outside contractors to do so. His expertise in these fields was recognised by other Divisions, and by such external bodies as the State Film Centre, Government Departments, several Municipal Councils and the Federation of Victorian Film Societies, all of which sought his advice. Wally retired quietly in 1981 after 48 years of unstinting service to his employer.

Wally gave the same unstinting service in his private life, with perhaps greater recognition. Life Member of the Rose Society of Victoria, he contributed to two books including a recent book by Dr. Thomas, and he propagated the Danielle Robyn rose, named after his daughter. He was also awarded the Moomba Medallion for Horticulture.

Life Member of the Waverley Historical Society, he contributed much to the records of that Society.

Life Member of the Federation of Victorian Film Societies, he screened films regularly for the annual Melbourne Film Festival; and for over twenty years monthly on Sundays he screened films for children at the Malvern Town Hall.

One of the two first Life Members of the Victorian Impulse Association, Wally was a member of the original group that designed the Impulse sailing dinghy, and as Registrar was responsible for preparing plans for the building of these dinghies. So great was Wally's contribution to this Association that a Perpetual Trophy has been inaugurated in his honour.

Patron of the Masonic Homes Photographic Club, member of the Musical Society of Victoria, Wally's interests knew no bounds. His advice was to keep busy, and until defeated by his illness he lived by that code, gaining a licence at the age of 70 to drive a 40-seater community bus for elderly citizens. While lying on the operating table he was urged to allow the doctors to take off his leg, but refused, preferring a shorter active life to a longer inactive one.

Wally's former colleagues are now widely scattered; those still living will regret his passing and will agree that he more than met the criterion of his former Chief Sir David Rivett, as quoted by Jack Cummins – 'to work for CSIR you had to be worthy of it'.

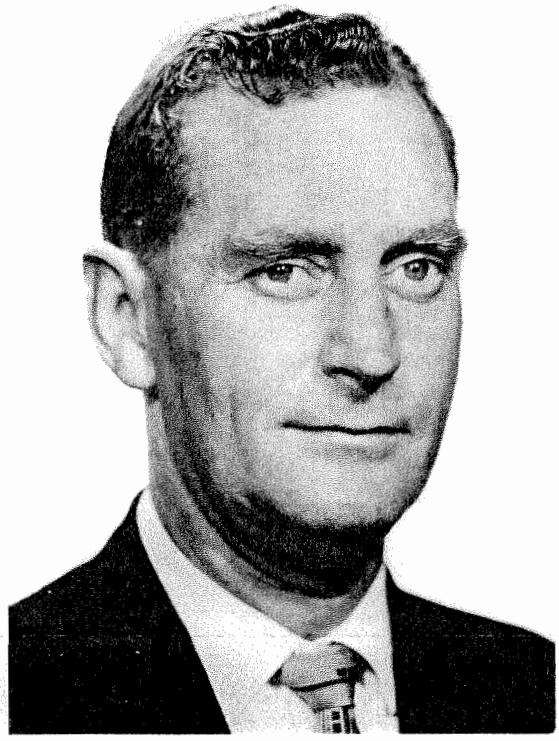
Wally is survived by his wife June, daughter Danielle and son Gary and family.

Vale Wally Hastie

Ross L. Cowling
Former member, Division of Forest Products

Epilogue:

When Wally Hastie died, Dr Geoff Christensen, and some other former officers of the Division of Forest Products, felt moved to organise a reunion at the Division of Building Research site at Highett on Sunday May 20. It was a huge success. People came from as far afield as Canberra and Queensland and included one member who was ninety years old, others in their eighties, and several who had joined the Division back in 1936.



The late Wally Hastie, photographer for the erstwhile Division of Forest Products, as photographed by an unnamed fellow-member of that Division.

Prince of Wales Award conferred on Grant Johnson

Grant Johnson, a Senior Technical Officer with the Meat Research Laboratory of the Division of Food Processing, is one of this year's winners of The Prince of Wales Award.

The Award was set up to give recognition to excellent performance, both within the Service environment and in civilian employment, by individual Defence Force Reservists in the ranks from Sergeant through to Major or their equivalents in the RAN and RAAF. In 1990, only ten Reservists achieved this distinction from a Defence Force Reserve of 300,000 members.

Grant, an Army Reservist, is a Section Sergeant with the 4 Preventive Medicine Company, and deals with training, health inspections, health and hygiene and administration.

The winners of the awards can choose to go to the UK, the USA or Canada on a two weeks' service attachment followed by a further two weeks' involvement with an organisation allied to their particular employment. Grant will be attending the US Army School of Health Science, at Fort Sam Houston, Texas. This will be followed by visits to Texas A&M University's College of Agriculture in Houston and Purdue University's Department of Animal Science in Indiana, which are centres of excellence in the sciences of beef and pig meat.

H.R.H. The Prince of Wales has given his patronage to the Awards, which are highly regarded within the Defence Forces.❖

Vale Alan Neish

Alan Neish, aged 43, a Senior Technical Officer in the Division of Tropical Animal Production at Rockhampton, died on Sunday the sixth of May 1990, after a six-month battle with cancer.

Alan started his career with CSIRO in 1970 when he joined the Meat Research Laboratory at Cannon Hill in Brisbane, and in 1976 he transferred to Long Pocket Laboratories, Division of Entomology. He collaborated with Keith Binnington and Bernie Stone in the first demonstration of the presence of norepinephrine in individual neurones of the tick brain, and with them and Ian Wright in the development of the successful prototype vaccination of dogs against tick toxin paralysis. Alan liked good research to be conducted at a good pace.

When the Division of Tropical Animal Science was formed in 1982, Alan transferred to the Nutrition Group, Davies Laboratory, Townsville, and worked with Chris McSweeney and Laurie Conlan. The progress of the Division in the past eight years owes much to the energy and competence that Alan brought to his work.

In 1987 Alan transferred to the Tropical Cattle Research Centre at Rockhampton, where he contributed to the research on overcoming post-partum anoestrus in cows and the development of the vaccine for the immuno-spaying and castration of cattle.

Alan was respected by all who worked with him, and he was admired as a mean player on the tennis and squash courts. His friends will greatly miss him, especially for his droll sense of humour.

His colleagues and friends express their sincere sympathy to his wife Charon and their children Steven, Kathryn and Lee-Anne.

Vale Alan Neish

Sirocredit annual report

Sirocredit, CSIRO's co-operative credit society, has just issued its annual report, which says the society has weathered the recent financial storms remarkably well.

The Chairman, Howard C. Crozier, said that the year just completed would be recorded as 'an extraordinarily difficult one for the financial services industry in Australia.

He said 'high interest rates have resulted in corporate collapses in both private and public sectors'.

'However' he added 'I can report that, while a number of less soundly based financial institutions have run into difficulties in this climate, we have completed a most satisfactory year.'

Eddie Sanfilippo, the General Manager of Sirocredit, said that the achievement of the society could be measured by the rapid growth it had experienced during the past year and its increased return to members.

The Board, Mr Sanfilippo said, had determined to keep loan rates well below the general market level, in spite of the pressure this put on the society's reserves.❖

How's your morale?

While launching the new INRE road show, *Science for Survival*, the other week (see story page 5) our Chief Executive announced the results of a recent national survey conducted by Frank Small and Associates as part of their regular opinion poll, *Consumerscope*.

CSIRO was regarded as the most reliable and trustworthy source of information about environmental issues by 51 per cent of Australians (a controlling interest?).

Next on the list were environmental groups with 25 per cent, then universities with 8 per cent, and government environmental authorities with 5 per cent. Vying furiously for last place were the Federal Government, State Government and private industry, each with 2 per cent of public confidence.

'The pleasing thing about the results', said Dr Stocker, 'is that they were equally strong irrespective of whether the respondent was a member of an environmental group, a financial supporter of such groups, or less active but still concerned about the environment'.❖

CARE FOR KIDS

...will soon be available to some CSIRO staff

A lot of hard work at the Black Mountain site in Canberra is about to pay off. If all goes well the staff there will have work-based child care by the time school starts up again next year.

A consortium has been chosen to design and construct the facility, with building to start mid to late 1990. Long-day child care will be offered on a full or part time basis for 44 children from six months old to pre-school age.

The facility is one of three to be set up by CSIRO, the others being at North Ryde in Sydney and Clayton in Melbourne.

For the last twelve months the small but enthusiastic Black Mountain Committee have been working to make on-site child care a reality. In recent months the intensity of their work has been blamed for record-level winds in the region as they struggle to raise the $15,000 they need to equip the centre. Cake stalls, raffles, chocolate sales and more cake stalls have so far raised $3,000, but that's still a long way from the target. Anyone who has a fund-raising idea, or, in the case of other Canberra sites, anyone who would like to help with organising, is very welcome to call Judy Flanigan on (06) 246 5218.

There have been a lot of enquiries from staff wanting to enrol their children in the new centre, and the Committee has decided to send a questionnaire around during May and June to get a more exact idea of numbers. It will also mean that children can be put on a waiting list and parents kept informed of progress, so Canberra staff should keep their eyes peeled for the questionnaire and return it quickly.

If you have any questions call Stephen Speer, Division of Plant Industry, Canberra, on (06) 246 5150.

Eager sellers and buyers at one of the Black Mountain Committee's successful cake stalls, organised to raise money for a staff child-care facility.

Note from the editor

I am taking a month's leave as soon as this issue is all wrapped up, and, since I am the only member of the staff of *CoResearch*, there will be no issue while I am gone. Depending on how soon I can get away, the next one should come out mid to late August.

Blue bargains

Divisions needing to replenish their stocks of blue file covers might like to consider using recycled paper. The Print Advisory Service recently organised the printing of two types of file cover for a Melbourne Division using attractively coloured 100 per cent recycled paper. The paper used was more expensive than the standard light blue type, but depending on quantity ordered the increase can be marginal. The coloured recycled paper is a new product and easier to obtain at present than the usual light blue file cover stock.

For more detailed information or samples, please call Jim Quinlan or Roy Osborne on: (03) 418 7442, or fax (03) 417 6125.

Now and then ...

I came across the following piece of ancient wisdom in the Beacon – the fortnightly newsletter of the Division of Building, Construction and Engineering, and couldn't resist stealing it.

...

We trained hard, ... but it seemed that every time we were beginning to form up into teams, we would be reorganised ... I was to learn later in life that we tend to meet any new situation by reorganising; and a wonderful method it can be for creating the illusion of progress, while producing confusion, inefficiency and demoralisation.

Gaius Petronius, 65 AD.

***CoResearch* is produced by the Public Affairs Unit for CSIRO staff and interested outsiders. Readers are encouraged to contribute or offer suggestions for articles. Stories may be reproduced, provided acknowledgement is given to both *CoResearch* and CSIRO. The deadline for contributions is the 15th of each month, but earlier is better, as issues fill up fast. Editor: Liz MacKay, PO Box 225, Dickson ACT 2602. Phone: 06 276 6567. Fax: 06 276 6641.**

CoResearch

No. 334 September 1990 CSIRO's staff newspaper

Budget response: no news is good news (but oh! that efficiency dividend!)

Contrary to the impression given by the popular press in the last week or so, the response from CSIRO's top brass to the Budget Statement has not been one of bitter outrage. They do not feel that the government has 'broken its promises' or that an 'axe has fallen' on their work. Since we had already gained triennial funding there was only one major surprise for us in this Budget, and that was the 1.25 per cent 'efficiency dividend'. That element certainly did evoke a negative response, and an interesting one, with something approaching consensus on the question of the government's avoidance of plain English! A selection appears below.

Dr Oliver Mayo, Chief, Division of Animal Production

'A cut is a cut is a cut. To label it an "efficiency dividend" with work as labour-intensive as ours is just nonsense, and very dishonest. If you lose 1.25 per cent of your scientists, you do at least 1.25 per cent less research.'

Dr Brian Embleton, Chief, Division of Exploration Geoscience

'In the present economic climate, CSIRO has been treated fairly in the Federal Budget. The Government has honoured its commitment to maintain our budget in real terms and indeed has provided an additional $4.1M for new research initiatives.

'The efficiency dividend as applied across the board in CSIRO will continue to be a running sore until we can convince Government that it should apply only to administrative services.'

Dr Ted Henzell, Director, Institute of Plant Production and Processing

'We lost the battle on the efficiency dividend, but the war is only just beginning in relation to our three-year budget. That's what everyone in the Organisation ought to be concentrating on.'

Dr John Finnigan, Acting Chief, Centre for Environmental Mechanics

'It is disappointing that the Government has cut research again despite its clever country rhetoric. And they don't even have the honesty to call it a cut. We become more efficient and the Government gets the dividend. At least the Federal Department of Newspeak seems adequately funded.'

Dr Tom Spurling, Acting Director, Institute of Industrial Technologies

'I believe that CSIRO can be pleased with the outcome of this budget. The Government has confirmed its long-term commitment to science and technology in Australia.'

Dr Ron Sandland, Chief, Division of Mathematics and Statistics

'My own view of the Budget is that it contained few surprises except the efficiency dividend. An efficiency dividend is a funding cut by another name. The concern is that, if it were to be applied for three years, the implications would be quite serious. Thus it is most important, as John Stocker has already stated, that we present an impeccable case against its continuation in the discussions as funding for the next triennium. As a starting point I suggest we make a careful analysis of the precise definition of the term "efficiency dividend" so that our case can be sustained. The Department of Finance's clawback philosophy is what disappoints me most!'

Dr Max Whitten, Chief, Division of Entomology

'It is most disappointing that the budget continues to be cut under the guise of an efficiency dividend. If the Government is comfortable with imposing cuts, then let's call a cut a cut and stop pussy-footing around.'

Dr Roy Green, Director, Institute of Natural Resources and Environment

'Given a few minor disappointments, it's more or less steady as she goes. I would very much support the Chief Executive's strong line that we should not be expected to find an efficiency dividend against actual research activity, because all *that* means is we'll have to reduce research.'

Dr Brian Walker, Chief, Division of Wildlife and Ecology

'I'm not going to go so far as to say that positions will go, because we still don't know the impact of the budget cut. Basically it's a loss of dollars, which means not being able to replace outdated equipment and stopping new initiatives.'

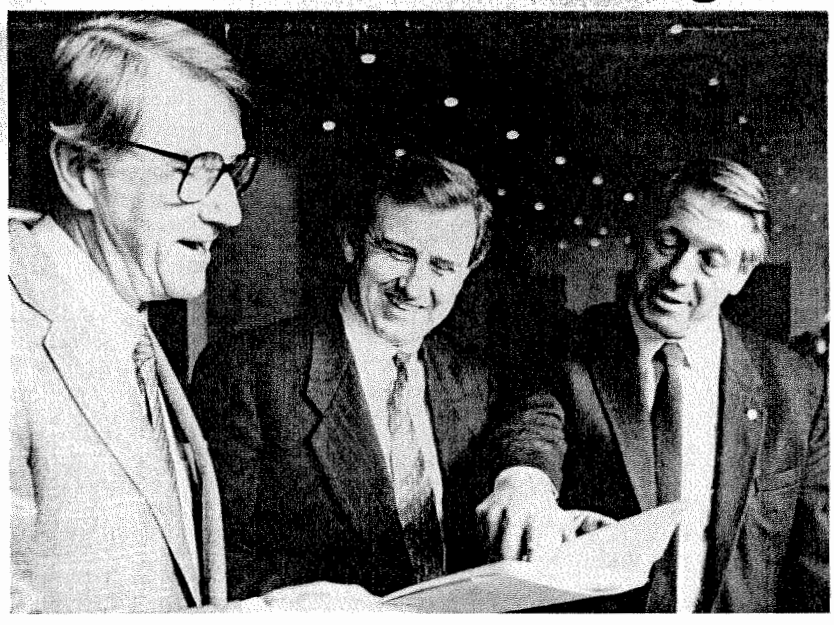
Dr Angus McEwan, Chief, Division of Oceanography

'Since CSIRO's "product" is research results, the efficiency dividend could only be justified if it could be shown that efficiencies in research have been created by rationalisation. In fact the reverse is probably true.'

Dr Des Walker, Chief, Division of Food Processing

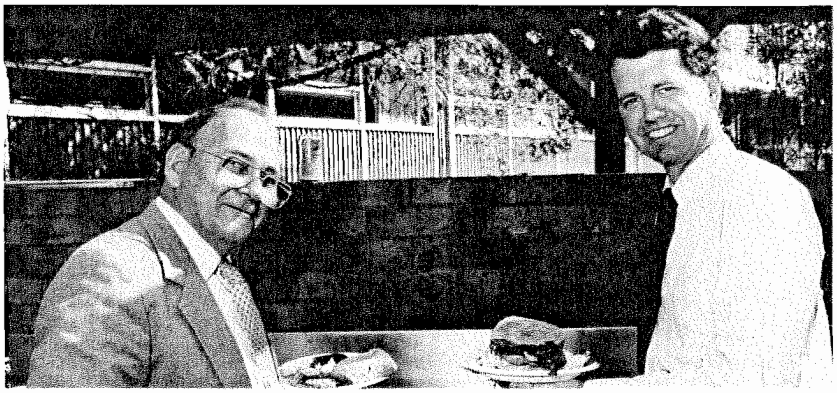
'Whilst the provisions were not greatly different from what might have been expected, the attitude of Government to the direct funding of CSIRO continues the pattern of the past 13 years: less funding available for support of existing research, continuing need for reductions in staff numbers, and continuing rundown in facilities.'❖

Science in the limelight



Above, left to right, the Honorable Neville Wran, Chairman of CSIRO, the Honorable Simon Crean, Minister for Science and Technology, and Dr Roy Green, Director of the Institute of Natural Resources and Environment, look through the Institute's newest publication, ***Australia's Environment and its Natural Resources: An Outlook.*** *The report, launched by Mr Crean at Parliament House in Canberra on 14 August, attracted a great deal of media attention. The national newspaper* ***The Australian*** *devoted four separate articles to a detailed examination of the points made in the twenty-page booklet, and the report was also extensively covered in other newspapers. Mr Crean took the opportunity to say that it was scientists who could provide the knowledge Australia needed to understand and resolve the conflict between environmental and economic concerns. Photo by News Limited.*

We deliver! (Priority Paid)



Dr David Mahoney, Chief of the Division of Tropical Animal Production, with Dr John Stocker, Chief Executive, at a staff barbecue held during Dr Stocker's visit to the Division's Longpocket Laboratories in Brisbane back in May this year. Photo by Lin Martin, Internet.

It's true that CSIRO is well-regarded in the community. Division by Division, the work we do is held in high esteem. But we still have to justify our existence as a single, and large, public institution.

Why *not*, after all, split us up into individual units and let each scramble for its own scraps of federal funding? Governments in the past have suggested it, and the coalition spokesman on science policy has yet again reopened this issue!

That's the challenge that makes priority-setting so vital. If we can't assign priorities among our areas of research, various though they are, we might as *well* be split. The ability to set priorities seems to me the single most important argument for the continuing existence of CSIRO as a large structure.

Of course, it does mean comparing apples with pears. How do you compare the value of gazing at black holes in the middle of the Galaxy through the Australia Telescope with the value of developing new boning techniques for abattoirs? Nevertheless, that is exactly what the CSIRO Executive has got to do, and is doing. It is comparing such activities and calculating the return the nation gets on its investment in any of the three areas the Organisation is expected to achieve a return in — the economic, the environmental, and the social well-being of Australians.

The whole thing began about a year ago: the Board decided that the Organisation needed to take a step back and look at its priorities, and that's been whole-heartedly endorsed by the Executive. They are working closely with the Institute Planners, whose group is chaired by Ian Elsum, and the Corporate Planner, Don MacRae.

We've developed a methodology for performing this broad priority-setting exercise, and once the Executive has produced its first results — which is literally any day now — it will be consulting with the Institutes and Divisions and challenging them to use the tools developed to perform the same task of priority-setting within their own industry sectors.

The Executive doesn't imagine, and I don't imagine, that creativity can be managed by top-down management structures. In other words we don't think that because we can set priorities we are contributing directly to the creativity of scientists. The moment of genius always occurs at the fringe of the Organisation, is always the sort of chance that favours those prepared minds working at the bench.

What we can do, though, is make sure that at least some seeds fall on really fertile ground. We can provide a set of conditions defining the priority areas for the Organisation such that when an inspiration comes, if it is in one of those areas, we can really get behind it with full resources.

I see priority-setting as the best possible way of supporting creative people within the Organisation who come up with new ideas and concepts that fit squarely into the areas we've identified as priority areas.

We must choose areas, but, having chosen, we must be able to move quickly and effectively to back new ideas in those areas.

As for my own personal priorities, one that stands high on the list is making sure CSIRO attracts and retains the best people. That was why I chose to lead the case for our award restructuring by appearing as our first witness when the case opened in Canberra on August 7.

Another of my top priorities is communicating the return on investment that the nation gets for its dollar from CSIRO. I recently went to a meeting of CSIRO communicators in Melbourne where I raised that priority, and I was particularly impressed by the work of Cathy Foley, who also gave a presentation. I would like to offer her a special word of support and applause for the work she has put into establishing a popular radio program on the local station, 2BL. That sort of enterprise, at small expense, can vastly raise the profile of both science in general and CSIRO in particular. I'll be saying more about that when I talk about Project Ambassador in the next issue.

Letters to the Editor

Dear Editor,

It is difficult to believe that Ross Hansen (*CoResearch* No. 333, June 1990, page 2) could have hoped that decentralisation of Administrative Staff would lead to reduction in their number. Obviously proliferation must require additional positions.

The key factor is that a greatly improved Administrative service with shortened lines of communication and operating time should be enhancing research output. I hope this is happening. If not, the exercise has been an expensive waste of time.

Eric French
Retired, ex-headquarters

Dear Editor,

Mr R. W. Hansen of Tropical Crops and Pastures reports that administrative staff numbers have increased from 450 to 1,150 in the last three years (*CoResearch* No. 333, June 1990, page 2), according to the "Careers in CSIRO" pamphlet.

In 1988, the designation of Administrative Service Officer was introduced. All clerical assistant and keyboard staff had their positions redesigned and moved in the same stream as administrative officers. These clerical assistant and keyboard staff are not in the first set of figures but are in the second.

If a comparison of equivalent groupings were made there would actually have been a fall from over 1,250 rather than a jump from 450.

Malcolm Robertson
Research Data Office

Dear Editor,

I'd like to use the columns of *CoResearch* to convey thanks to all the staff who participated in the survey of Corporate Publications carried out last year through the Communication Working Group.

Their thoughtful comments were of great help to us in coming to our recommendations. Their patience is finally being rewarded as the results of that review are about to be issued.

I am the convener of the CWG sub-group that carried out the review. We reported to the CWG in May this year and the July CWG meeting approved distribution of the Report, the survey and a report on outcomes.

One of the frequent comments made during the survey was that corporate publications would be improved by having a common design. The CWG and PAU took this up and we sought design concepts this year from internal and external designers. A selection panel of Divisional and Institute representatives chose one from those submitted and Dr Stocker has approved its use on covers.

When the designer has worked up the concept into a finished form you will start to see corporate folders and publications following the new cover specifications. Institutes will also follow them but Divisional use is optional.

Jenifer North
Public Affairs Unit

Dear Editor,

It is interesting to speculate how the provision of cars to some senior 'high achieving' research scientists got past the Arbitration Commission without raising any eyebrows. Regardless of how it was achieved, it is a welcome (albeit belated) recognition by CSIRO of the pressures from the market place. After all, Telecom technicians have had Nissans available at about $20 a week for some time. Even the Melbourne Board of Works provides Camiras to its engineers for a similar sum.

Therefore, I have no gripe ('amazing!' some might say) with the provision of cars to our high achievers because, unlike some others, I realise that this is an area where a true trickle-down effect has a chance of taking place. Nevertheless, since it is unlikely that the cars will be taken away for failure to perform (conditions, however won, are rarely rescinded), it ought to be a condition that each of these scientists generate sufficient money from external sources to pay for, say, three extra cars per year. That way, the whole of CSIRO could soon become car-equipped and those people who have felt envy or anger because they believe precious research funds are being wasted would have to find something else for their angst.

Michael H Jones
Division of Mineral Products

More letters on page 6.

A Matter of Opinion

This month's column comes from Ralph Ward-Ambler, Chairman of the CSIRO Board's Sub-Committee on National Research Priorities.

As a member of its Board, I am consistently impressed by the scope of the challenge and opportunity presented to CSIRO. Both its Act and its Ministerial Guidelines afford it the flexibility to spend a Government appropriation of almost $400 million a year essentially as it sees fit. The only real constraints are that areas of significance to national economic development receive preferential support and that priorities are planned with due regard to Government policies. On top of that, the Organisation is free to go out into the marketplace and sell its services wherever it can find a buyer.

There is no way of escaping it. CSIRO is an organisation very much in charge of its own destiny. I can think of very few areas of scientific and technological endeavour in which we could not become pre-eminent if we wished to. However, we cannot be pre-eminent at everything. In an increasingly competitive world, we may have to accept that in the future we will have to be pre-eminent in rather fewer areas than we are now, or run the risk of being mediocre in some of them.

The message in all this is obvious. CSIRO has a major responsibility to work out where its effort should be focussed and be prepared to change accordingly. Given its dominant position in scientific research in this country, it is proper that it also formulate a view of the totality of national research priorities and promote this widely. The Board established its Sub-Committee on National Research Priorities to provide guidance for the Organisation in this regard.

To determine priorities and establish broad strategic directions we need to look ahead ten or more years. We must approach the problem with a clean slate, rather than nibbling at the margins of our present position. The Board is only interested in the big lumps. As an example, could a large and sustained boost in research spending reduce our huge information technology trade deficit? If we decide that it is both possible and desirable, where do the balancing cuts come from?

The Board Sub-Committee recognised that strategic thinking at this level needs a framework to guide and support it. It therefore gave priority to establishing a methodology for decision making. This was completed earlier this year and the Board has delegated further work on priority setting to the Chief Executive. The Board will review and approve the Chief Executive's conclusions in the context of a Strategic Management Plan. Although it was developed to deal with the broadest strategic level, the method has general applicability and can be used as the basis for priority assessment at all levels of the Organisation.

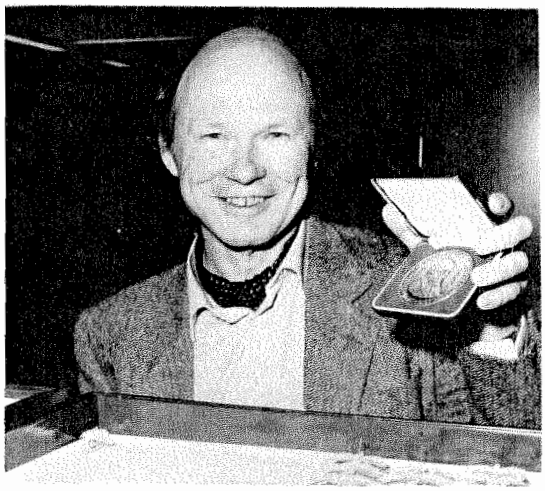
The methodology is simple even if the judgements embedded in it are difficult in the extreme. It demands that decision-makers weight and comparatively judge the potential economic, social and environmental benefits of research carried out in defined areas. It then demands that they assess the feasibility of those benefits actually being delivered by scoring individual weighted criteria such as the probability of the research being successful and the technology being transferred to an Australian enterprise. The research areas can be plotted according to their benefits and feasibility. All of this does not provide a decision — it is simply an aid or guide. In trials, the discipline of thinking in this fashion proved very useful to the participants.

It is not perfect, but no methodology considered was. Decisions will always be made based upon the values and less than perfect knowledge of decision-makers. It is important that we start using what we have. At this stage, my major concern is that the success I believe we have achieved in catalysing critical examination of research priorities does not get bogged down in endless debate about details of methods and data. We must achieve real action in implementing agreed strategic priorities.

So what are the priorities? The question still remains largely unanswered, but I trust that this will not be the case by this time next year. In his column (opposite) the Chief Executive discusses his approach to this important task. Whether or not there is to be a marked long-term change in its activities, CSIRO priorities and allocation of resources must be based on more than its history and *ad hoc* responses to short term pressures. Both the Organisation and its stakeholders deserve better than that.

❖❖❖

International honour for Ebbe Nielsen



Dr Ebbe Nielsen of the Division of Entomology has been awarded the Karl Jordan Medal for his work on moths and butterflies (Lepidoptera to their friends). His studies are recognised as having advanced our understanding of the evolution and diversity of this insect order, which, with 22,000 species in Australia and 300,000 species world-wide, is probably the second largest group of all living organisms. (Beetles still top the list.)

The Karl Jordan Medal, which has been called 'the Nobel Prize of entomology', is awarded by the Lepidopterists' Society in recognition of original research. Some years, it is not awarded at all, as it requires the *unanimous* vote of the committee.

The prize itself consists of an engraved silver medal, a $1,000 cash award and travel expenses to accept the award. Dr Nielsen was presented with the award at the annual general meeting of the Lepidopterists' Society in Milwaukee, USA, in June.

Dr Nielson is head of the Taxonomy and General Biology Section and the Australian National Insect Collection, based at the Division's Black Mountain headquarters in Canberra. His other primary research interests include

modern systematic methods and cost-effective ways of handling insect taxonomy;

database/checklist/illustrated catalogues of Australian Lepidoptera; and

biodiversity of Lepidoptera and the use of Lepidoptera as bioindicators.

He currently serves as editor of *Monographs on Australian Lepidoptera*, Lepidoptera editor of *Entomologica Scandinavica* and *Fauna Entomologica Scandinavica*, and is one of the taxonomic editors of the revised *Insects of Australia*.

Dr Nielson places a high priority on field work, covering much of Australia in search of additions to the Australian National Insect Collection. This is the largest collection of Australian insects, containing more than eight million specimens. It is a vital research tool, contributing not only to entomology, but also to ecology, animal behaviour, biogeography, evolution and genetics.❖

Nominations are invited for the 1991 Lyle medal

The medal recognises outstanding achievement in research in mathematics and statistics.Work carried out during the whole of a candidate's career may be taken into consideration but special weight will be given to recent work.

Nominations should include a publications list and a detailed curriculum vitae. Nominations are confidential and should be addressed to the Executive Secretary, Australian Academy of Science, GPO Box 783, CANBERRA ACT 2601. Nominations close on 30 September 1990.

Telephone enquiries: Faye Nicholas, (06) 247 5777

Brave new world

...but not *too* brave

CSIRO is always hitting the papers with new discoveries in the field of genetic engineering, but what are we doing to make sure that work is completely safe? When it comes to changing the course of nature, even though that is something we humans have always gone in for, the public is ready to bring its best paranoia to bear. The path from seedless grape to Killer Tomato is seen as straight and short, the double helix as a sacred spiral staircase not designed for feet of clay, and power to change us all to slaves and supermen a likely outcome, since a likely goal, of future tyrannies. Simon Grose of the Public Affairs Unit in Canberra decided to check out a couple of the CSIRO people who are keeping an eye on genetic engineering projects. Wayne Gerlach of Plant Industry, famous for his work on gene shears, sits on the Small Scale Subcommittee of the Genetic Manipulation Advisory Committee, or GMAC, while Dr Margaret Roper, also of Plant Industry, but in the field of microbial ecology, is on its Planned Release Subcommittee. Below, they reveal a little of what that work involves.

Margaret Roper

Grose: **What do you do on GMAC's Planned Release Subcommittee?**
Roper: We look at applications for the release of genetically manipulated organisms to the environment. Our aim is to ensure that there is no danger in the proposed release.

What guidelines and procedures do you follow? In particular, what are the key issues that you have to consider?.
Scientists who are working on a genetically manipulated organism and want to release it must apply to us under a certain format and answer a number of questions about the project. They must spell out exactly what the organism does, and exactly what the changes are to its genetic structure. They have to submit the application first to their IBC (Institute Biosafety Committee). Then it goes to GMAC, and GMAC has a number of people from different disciplines who are able to assess the application and decide whether it is safe to release the organism or not.

How much of your own time is taken up by this work with GMAC?
Sometimes it's quite a lot. It entirely depends on the applications that are coming through. We are now having regular GMAC General Committee meetings more to discuss policy and to develop guidelines. The guidelines are continually evolving as more information becomes available.

We've got a lot of expertise together. We're being very cautious about our approach to the release of organisms and we're developing guidelines that reflect that, but as we get more knowledge about how organisms behave in the environment, and how these genetically manipulated organisms behave, our guidelines may change.

However, I think the basic principles will remain the same. It's just that with more information we are better able to judge each particular case.

So you would agree that GMAC is conservative?
Very much so. I don't think there's room for any other attitude. Particularly with the public being very reserved about the release of genetically engineered organisms.We've simply got to take very great care.

How many organisms have been released in Australia?
Six to eight, at the most. Most of them have been under controlled conditions anyway. They have had to be contained within a particular area and at the end of the experiment there has had to be a clean-up procedure. So it's not as though they're going straight out into the environment.

And is the number of applications growing?
I certainly envisage that it will increase a great deal. Even within this Division, there are a number of people working on manipulated organisms. Once the scientific development is complete, further testing will be needed. The organisms will be tested first in controlled environments and eventually out in the field before they can be used, but before doing so the scientists will need to apply to their IBCs and then to GMAC for approval.

What procedures are there for potential conflict of interest from, say, a CSIRO application being considered. Is that an issue that is formally dealt with? Do you absent yourself from discussions on such an issue?
We haven't had any from this Division yet, so there hasn't been precedent for that. But I wouldn't consider it a conflict of interest unless it was my work that was being discussed. Then I would have to step aside. But if it were someone within the Division I would treat it in exactly the same way as I would if it were someone from Western Australia or Darwin, or wherever. It's got to be looked at objectively.

Well, that may seem strange in a wider public context. I think that's an issue that science is going to have to sell to the public — that we are noble and true. And it would be hard. If I was a journalist and I knew what you were assessing, say, an application from a person in the lab next door, then I would think that here was a classic story of potential conflict of interest. And GMAC would have to be seen to resolve that.
I don't think so. Of course I would need to declare any personal interest in a project. But I could not sidestep any of the processes of assessment because if an organism was released that turned out to be harmful we could all be at risk, including myself.

What do you know about GMAC's planned release guidelines compared with overseas procedures? We are leading in many areas of this kind of research and one would assume that we would be leading in the regulations. Is that fair enough?
I think it's fair to say that. We've drawn on the experience and the knowledge of other countries, but we've also used the expertise within the GMAC to develop the guidelines further. There are international meetings where guidelines for genetic research are discussed.

The moral issues involved with genetic engineering — is that something you have any particular views on?
Faced with something very controversial I think there would be strong views expressed by members of the committee, for example, the moral issue of human genetics.

However, I do not see genetic engineering to develop, for example, a vaccine to give immunity to disease as being controversial. It is an attempt to improve the quality of life. Scientists have been altering the gentics of crop and animal species for years by using traditional breeding techniques. The use of new technologies to bring about changes in genetics does not in itself make these changes immoral. If, by genetic engineering, for example, a plant with a high tolerance to salt is produced, it may be possible to farm large areas in Australia which previously have been unused because of a significant salt problem.

Critics of this area of science would say that this was the thin edge of the wedge. That the expertise is growing and what you've got now is a growing momentum towards a 'pork chop tree'.
Ha ha! No, that's just crazy! This is the fantasy image of genetic engineering that has developed through the films and such, and it is quite unrealistic. Essentially, some of the cases that have gone through GMAC have been aimed at producing-vaccines against micro-organisms, and some of them are, potentially, very effective means of controlling disease.

❖❖❖

Wayne Gerlach

Grose: **A proposal comes to GMAC - how is it assessed?**
Gerlach: To get approval for a genetic engineering experiment in Australia you have to submit your case to the relevant Institute Biosafety Committee (IBC). Every research institution of Australia has an IBC. It is made up of appropriate members of the institution, with sometimes external members as well. They assess and make recommendations on particular proposals. They can approve the proposals

What is GMAC?

The Genetic Manipulation Advisory Committee (GMAC) is Australia's central co-ordinating body for monitoring the development and use of genetic manipulation techniques. Its job is to identify and manage any possible risks to Australians or their environment that might arise from manipulated organisms.

The Committee is made up of seventeen part-time members with various skills relevant to the task of assessing genetic manipulation proposals. It is administered by the Commonwealth Department of Administrative Services in Canberra.

themselves,with notification to GMAC, or they can submit them to GMAC for further advice.

So an institution could approve its own work?
There is the ability there, but it must provide the information to GMAC. Each project does go past the GMAC desks on a project-by-project basis, requiring advice or notification, or simply for information and comment. GMAC at times does pick up things that an IBC has missed, but it's rare. The IBCs are very responsible;they make the correct decisions. GMAC can only advise as to the suitability of doing experiments. So that's what it does.

What do you do on GMAC's Small Scale Subcommittee?
We are concerned with the small-scale work.This is defined as under ten litres by volume, and, though arbitrary, that is actually a fairly good cut-off point between experimental work and production work: people who are doing small-scale experiments in laboratories are generally working way below ten litres, and people who are doing production are way above.

Have you knocked many proposals back?
Some proposals have been knocked back, and some experiments have been stopped. Many experiments have recommendations applied to them. Further information is called for, or various conditions have to be satisfied, by alteration to either the experimental design or the facilities or by providing further information, as necessary.

Does GMAC have any powers of investigation or sanction?
It does in fact have sanction. If GMAC advice is deliberately ignored, the repercussions could be quite traumatic for the institution concerned. They could include the naming of the institution on the floor of Parliament,which could well have an effect on further funding to that institution. In fact, that seems to have worked quite well.

How much of your time is taken up with GMAC?
It varies. The Scientific Subcommittee will meet somewhere between four and six times a year. There are the general meetings as well. And I would say every two weeks I get a batch of proposals and information for assessment. In terms of actual time I can't say; it varies according to what comes in each fortnight.

And for your gene shears work — how many approvals did you have to get through GMAC?
That comes out of an approval that we had a couple of years ago, and we haven't begun anything new that requires any approvals at present. There are some in the pipeline.

How do GMAC's guidelines compare with overseas guidelines?
GMAC keeps itself informed in what's happening overseas. Essentially it's the same as in Australia. I think that's because what precipitates out at the end is a sensible, rational way of doing things.

Is GMAC Conservative? Are you more careful than not?
I think so. I think some of the scientists whose work is assessed by GMAC consider that we are conservative. But there's an advantage in that. Obviously it's important that we do take a careful, conservative line.

Do you think it's incumbent on scientists to work to educate the public in the area?
Yes. It is important. I think the perception that this is a dangerous area of research has been promoted by a very small minority. If they took a rational approach and really aimed to educate themselves, they would find that it has a lot to offer society. I think the public isn't as well informed as it could be.

While some people may be concerned, others may simply regard it with awe, as some new high-tech thing that's potentially amazing. I think there are a lot of people in favour of genetic engineering research.

You talk about being rational — isn't a lot of the resistance to this kind of work based on religious or quasi-rational reasons that don't claim to be rational?
Sure. But there again I think that knowledge is really what is required. I would say that genetic engineering is not really doing anything different from what has been happening for ages — bacteria have been scavenging pieces of DNA, there has been movement of DNA from one species to another, plant breeders have been crossing plants ... Genetic engineering is really just a more sophisticated way of doing the sorts of things that Nature and Man himself have been doing for a long time now..

Genetic manipulation: where do we stand?

On 13 August Dr John Stocker chaired a meeting to formulate CSIRO's policy on genetic manipulation — in particular, our policy on the release of genetically manipulated organisms (GMOs) into the environment.

The outcome of the meeting was an affirmation of the role of genetic manipulation as an important tool in CSIRO's search for solutions to Australia's health care, agricultural and environmental problems.

At the moment all genetic manipulation work carried out in CSIRO must obey the guidelines laid down by the Genetic Manipulation Advisory Committee (GMAC). However, there was agreement that the current arrangements for environmental release of GMOs were confusing, with authority for approval spread across a range of State and Federal Government departments.

The solution suggested — and supported — at the meeting was the establishment of a single reference point with legal authority to receive, review and approve GMO release. The process of review could make use of existing expertise in GMAC, State Environment Protection Authorities and other bodies.

It was agreed that the new regulatory system would need to be accessible, efficient, well-advised and predictable in its requirements if environmental and economic benefits are to be captured for Australia.

In the meantime, John Stocker will personally review all applications for GMO release before they are submitted to GMAC.

The meeting drew together representatives of relevant Divisions and Dr Merilyn Sleigh, recently named as CSIRO's genetic engineering contact person.

Is GMAC adequate? Do you feel like you're on top of it?
Yes, I think so. In the absence of any significant problems in the last ten years, I think its record speaks for itself.

Would it be possible for someone to do work that came under GMAC auspices without GMAC knowing, without approval, especially in a private firm?
I guess it would be. But the repercussions could be quite substantial even for a private company — in terms of grants and assessments. Certainly all the biotechnology companies in Australia do go through GMAC. And the community of those firms and the Government organisations is close-knit enough that it would be very hard to do something without that community being aware.

GMAC is all about hazards. It doesn't deal with morals. What is your moral stance on genetic engineering? Is it something humans should do?
To me, it's providing a tool for doing things that bacteria and civilised man have been doing for ages, anyway. Probably doing it in a more defined and specific way where you know exactly which gene you're bringing in, rather than simply scavenging genes or bringing in large amounts of genetic material. I don't see any moral problem with that.

❖❖❖

Margaret Roper and Wayne Gerlach discuss the work of the Genetic Manipulation Advisory Committee. Photo by Julie Faulkner of Plant Industry.

Letters ... *continued from page 2.*

Dear Editor,
Congratulations to the Research Data Office of Corporate Centre on the production of their Little Red Book (CSIRO Data Book 1989, Nov. 1989). Unlike Mao Tse Tung's Little Red Book, this one is free of political slogans, and contains only facts regarding the source and destination of funds spent by the various parts of CSIRO, and the number of staff.

I was particularly interested in Fig 3.2 'Staff numbers by Institute at October 1989' and Fig 2.18 'CSIRO cash expenditure 1986–87 to 1989–90 (est.)/expenditure by Institute (adjusted to $89–90)'. Combining these two figures gives the gross expenditure per staff member, and allows comparison of this year's expenditure over last year's, by Institute.

Gross expenditure per staff member of each Institute, and this year's change in expenditure of each Institute in real terms

(total 4.1% increase in expenditure 1988-89 to 1989-90)

Institute	Expenditure	Increase
Animal Production and Processing	$61 500	+1·1%
Plant Production and Processing	$61 500	+1·7%
Natural Resources and Environment	$69 800	−0·3%
Minerals, Energy and Construction	$68 800	−0·4%
Information and Communications	$77 400	+26%
Industrial Technologies	$72 300	+4·4%
National Facilities	—	+3·4%
Corporate Research Support	$123 000	+14·9%

I was surprised at the size of the Corporate Centre per capita budget, since in scientific work I associate high expense with the purchase, maintenance and use of elaborate scientific apparatus. I was even more surprised to read that the budget of Corporate Centre had increased by almost 15per cent this year, after being reduced by 45 per cent between 1986-87 and 1988-89. Perhaps the current increase indicates that the previous reduction had been achieved by discarding functions, rather than by adoption of more frugal modes of action.

Alister K Sharp
Division of Food Processing

Dear Editor,
The comparison made by Dr Sharp (opposite) in respect of the Corporate Centre requires further analysis because the CSIRO Databook does not show the full picture on the Corporate Research Support expenditures.

The figures he has used to calculate expenditure per staff member for the Corporate Centre include funds administered on behalf of Institutes, or what are termed Special Purpose Funds (SPF). Although these funds have been centrally managed they include items that are ultimately spent on behalf of the whole of CSIRO. For example, they include the Organisation's COMCARE premium, our fuel excise levy, the CSIRO–Universities Collaborative Grants Scheme, studentship costs and the 3 per cent superannuation benefit. Some of these costs will, in future, be charged to Institutes.

If the SPF funds are identified separately, and with the benefit of final 1989–90 expenditure data, the appropriate comparative figures are:

	1988–90 $M	1989–90 $M
Corporate Centre	27·2	25·98
Special Purpose Funds	18·5	21·20
	45·7	47·18

If one deflates the 1989–90 expenditure to 1988–89 dollars for comparative purposes, the real expenditure figure for 1989–90 is $45.7M — i.e. the same as in 1988–89. In the case of the Corporate Centre the 'deflated figure' is $25.2M, a reduction of 8 per cent over the preceding year, reflecting the continuing attention being given to achieving economies in support activities in the Corporate Centre.

Staff in Corporate Centre in 1988–89 totalled 417, whilst staff employed against SPF funds total 40. (The latter include Administrative Service Units, Communication Institute Support, officers on secondment to PAXUS, COMCARE Officer, and MIS staff who maintain the telephone network.) As at June 1990 the figures were 369 and 44, respectively.

The expenditure per staff member within the Corporate Centre is $65.2K in 1988–89 and $70.4K in 1989–90. If one adjusts the expenditure in 1989–90 to 1988–89 dollars the figure is $68.3K. This represents a real increase of 4.8 per cent.

The details outlined here are also relevant to the issues raised in Dr Vercoe's letter in the May edition of *CoResearch*.

P H Langhorne
Corporate Centre

Fulbright Awards

The Australian–American Educational Foundation is currently offering its 1991 Fulbright Awards for study, research, lecturing in the United States of America, commencing between 1 July 1991 and 30 June 1992.

The following are the six categories of Award, with closing dates for application.
SENIOR: 30 November.
POSTDOCTORAL FELLOW: 30 September.
POSTGRADUATE STUDENT: 30 September.
SHORT-TERM SENIOR SCHOLAR: 30 October.
SENIOR PROFESSIONAL: 30 October.
DAVID O. ANDERSON: 30 September.

There are no restrictions as to discipline, although a general preference will be given to those intending to undertake work in their discipline as it specifically applies to the bilateral relationship between Australia and the United States, or undertake comparative Australian/US studies. Up to 60 per cent of awards will be available for proposals in four specific priority areas: Pacific Basin Issues, International Trade, Higher Education Policy Developments, and Impact of New Technologies and R & D.

Enquiries: (06) 247 9331

We like it, but is it trury dericious?

Fancy a slice of a $400 billion market? That's the aim of several farsighted Australian food processing companies, with a bit of expert help from the Sensory Research Centre, Division of Food Processing.

Pictured at the luncheon held to mark the start of the Japan Project's Tokyo Operations in late July are, left to right, Mr Masaori Fujita, Deputy Managing Director, JETRO; Dr Des Walker, Chief, Division of Food Processing; the Honorable Neville Wran, Chairman of CSIRO; Mr Shuya Tase, Japanese Consul for Trade and Industry; and Dr John Prescott, Principal, Sensory Research Centre and Japan Project.

Japanese consumers spend over $400 billion on food every year, of which roughly $5.5 billion goes on processed food imports. Australian manufactured foods currently account for only about two per cent of this market.

The CSIRO's secret weapon, the Japan Project, is a study of food preferences and habits in Japan, with help from a Japanese consumer organisation and Chuo University. The principal aim is to enable the development of Australian food products specifically tailored for Japanese tastes.

Tokyo operations for the project were begun at the end of July this year. The work will eventually be extended to other Asia–Pacific countries.

Ento team applauded

The research team responsible for biological control of the floating weed salvinia has just received an Honourable Mention in the 1990 Rolex Awards for Enterprise. More than 4,000 projects from around the world were entered for the awards, which are made every three years. Five projects were selected for the main cash prizes and 35 were selected for Honourable Mentions. No Australian projects won main prizes this year but the arid land restoration work led by Mr Stephen Hill, Australian Revegetation Corporation Ltd in Perth, also received an Honourable Mention.

The salvinia team comprises Dr Wendy Forno, Dr Ken Harley, Mr Mic Julien, Mr Richard Kassulke, Dr Peter Room and Dr Don Sands, assisted by Mr Richard Chan, Mr Michael Day, Ms Tini Schotz and Mr John Whiteman. Their work has led to use of a tiny beetle for very cost-effective and environmentally sound control of salvinia mats blanketing rivers, lakes,reservoirs and irrigation channels in Australia, Papua New Guinea, India, Sri Lanka, Botswana and South Africa. Millions of rural people have received benefits collectively worth more than A$100 million as a result.

The team's work has been recognised before: they were awarded the UNESCO Science Prize in 1985 and an AIDAB Bicentennial Award For Excellence in Overseas Development Assistance, and Peter Room, leader of the team, received the CSIRO Officers Association James Rivett Medal in 1986. Collaboration with local scientists is under way to control salvinia in Malaysia and the Phillippines and the team hopes to help control the only other outbreaks of the weed in Kenya, Zambia, the Ivory Coast, Madagascar, Java and Fiji.❖

— an open letter from Dr Stocker

The following was sent to Mr Hignett in reply to the open letter from him to Dr Stocker that appeared in the June issue of CoResearch, No. 333.

Dear Mr Hignett,

Your open letter to me in the last issue of *CoResearch* seems to demand a response. When I responded to you privately I certainly did not realise that your letter was to appear in *CoResearch* and I was disappointed that it singled out an individual for rather negative public mention.

Regrettable as that is, you do provide me with the opportunity (or rather the obligation) to state in an open letter my appreciation of the long hard work put in by the small group of staff from the Human Resources Branch whose task it was to negotiate with our unions and to explain the proposals and their implications.

We all know that it is impossible to please everyone.

In my reply to staff who wrote to me about the early proposals I acknowledged that many well-reasoned arguments were presented. The principal concern at that time was with the labels, particularly the 'research support' label, and with the potentially divisive reaction to that label. The strength of that argument was acknowledged.

At least equally divisive however, and probably more objectionable to some, is your own categorisation of staff into 'productive' and 'manager/administration' groups.

In my travels to visit CSIRO sites and to meet personally as many staff as possible I have been greatly impressed by the intellectual rigour, the skills and the enthusiasm of those I met.

Those attributes apply to our administrative staff as well as our research staff. The teamwork you spoke of must be applied across the Organisation. 'Administration bashing' surely is outdated and counter-productive.

In every research organisation there is a tendency of scientists to malign research administration. Unfortunately, this seems especially pronounced in CSIRO and I wish to establish the basis for this and to act to remedy it.

We all have a tendency to blame 'non-real' people — the central office, the administration, the government — but I believe that the future strength of CSIRO will be determined in no small measure by our cohesion, co-operation and general will to pull together — as one team.

I invite you to join us!

John W. Stocker
Corporate Centre

Farmers save our soils

Left to right, Dr Albert Rovira, Division of Soils, Mr Bill Hayden, Governor-General of Australia, Dr David Smiles, Chief of the Division of Soils, and Mr Robin Manley, South Australian farmer, discuss how research is helping farmers fight soil erosion.

A hillslope saved from erosion by garbage — 30 old cars and about 1,000 tonnes of bricks — was the first stop for the Governor-General and his wife on a special tour of farms near Clare in South Australia on 23 July.

The tour was arranged by the CSIRO Division of Soils, so their Excellencies could view first-hand how farmers are using innovative ideas to save the soil.

Mr and Mrs Hayden attended a luncheon at Callum Downs Country House to talk to other South Australian farmers who are using new soil conservation practices to improve soil structure.

Chief of the Division of Soils, Dr David Smiles, and SA Department of Agriculture soil conservation expert, Mr Roger Wickes, highlighted the important roles played by research and extension in soil care before the Governor-General launched the 1990 Landcare awards for SA.

Dr Smiles said the Australian public was largely unaware of the extensive contribution that farmers and their advisers were making to soil conservation and sustainable production.

This was because the solutions to many of the problems could not be seen by the casual observer, even after a number of years. This did not mean that farmers were ignoring soil conservation, he said. On the contrary, farmers around the nation were forming Landcare groups, and, with the help of researchers, were tackling soil degradation problems such as salinity, acidity and erosion.

"Many farmers realise that soil conservation measures are essential to maintain long-term profitability," he said. "However, there is no quick-fix solution".

Dr Smiles said that farmers were showing great initiative in their approach to soil degradation problems. An example was the reclaimed hillslope on the local Jaeschke property. There, building rubble and car bodies have been put to good use to stop large-scale soil erosion.

Until 1984, the creek flooded every winter, gouging out the valley, collapsing the hillslopes and carrying about 10,000 tonnes of soil downstream.

To stop the damage, twenty-six local farmers formed the Magpie Conservation Group Catchment Scheme, built a series of contour banks and dams upstream, reinforced the hillslopes with old refuse, and planted trees.

According to the Jaeschke's, the results have been staggering. Very little soil is now lost downstream and the land is productive.

Malcolm Bartholomaeus and his father Robert have had a similar success with a different problem on Callum Downs: salinity.

When they first noticed bare, saline patches appearing in their crops, they decided to take a long-term, whole-farm approach, planning to allocate five per cent of their yearly gross income to rectifing the problem.

Their strategy involved establishing a different yearly sequence of crops and pasture, refencing so the saline areas could be treated separately and establishing deep-rooted lucerne to increase pasture production and lower the high-water table causing the problem.

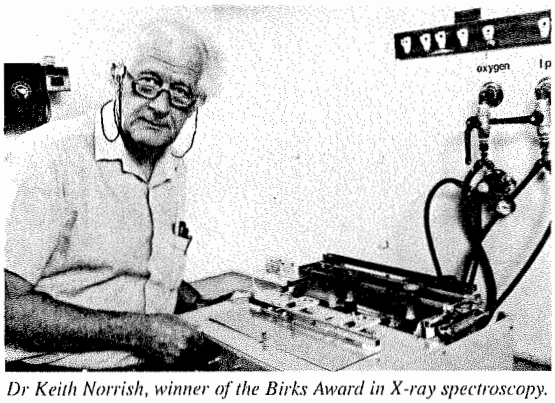
The extra profit expected from increased production is to be used to finance the costs of a re-treeing program.❖

Birks Award to Keith Norrish

The internationally recognised Birks Award in X-Ray Spectroscopy was presented on 1 August in Colorado, USA, to CSIRO Division of Soils scientist, Dr Keith Norrish, for his contribution to the field of X-Ray Spectrometry.

Dr Keith Norrish has made important contributions to the mining and agricultural industries by pioneering the use of X-Rays for chemical and mineral analysis.

In 1946 he built an experimental X-Ray spectrometer and one that he and his colleagues constructed in 1950 was used over the next ten years for soil, plant and mineral analyses. When commercial instruments became available in the early 1960s, Dr Norrish was skilled in the theory and practice of X-Ray analysis, and was able to devise methods appropriate to particular industries and to train their personnel.



Dr Keith Norrish, winner of the Birks Award in X-ray spectroscopy.

Since then he has been involved in helping most of the mining industries in Australia. He is currently working with the Standards Association of Australia and the International Standards Organisation to standardise X-Ray analytical procedures. The methods he has devised are quick and capable of high accuracy. The resulting economy and reliability result in considerable savings to industry. His methods are now widely used in Australia and overseas.

Dr Keith Norrish has been honoured by various scientific bodies. He was elected a Fellow of the Australian Academy of Science in 1977, was awarded the Prescott Medal by the Soil Science Society of Australia in 1977 and received the Order of Australia in 1989.❖

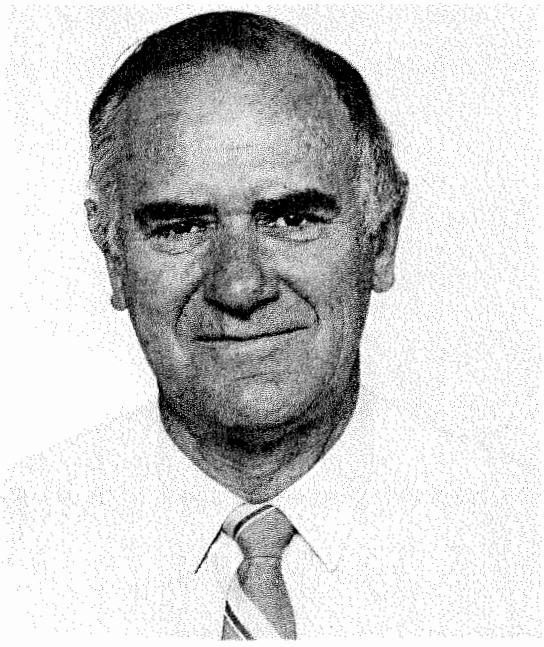
Yet another Soils success!

Dr Kevin Tiller of the Division of Soils has won the J. A. Prescott Medal for his 'significant contribution to soil science'. The Medal itself will be presented when the Australian Society of Soil Science next meets.

The main theme of Dr Tiller's research career has been the study of micro-nutrients in soils and plants.

In the 1950s the chemical basis of soil micro-nutrients was poorly understood, and Dr Tiller's work has uncovered the research approaches necessary for a sounder understanding of this field. It has also stimulated new avenues of research internationally.

His research achievements include studies of weathering processes in relation to soils; the reactions of trace metals with soils; toxic metals; and soil acidity.❖



Dr Kevin Tiller, Division of Soils

Surely the Opposition wouldn't consider raising funds for science through gambling? Perhaps it's an idea worth thinking about, but the contraption they are gathered around is actually a corona suppression ring used in electrical tests to reduce discharges. Mr McGauran, Shadow Minister for Science, spent a morning looking over working displays in a range of laboratories in the Division of Applied Physics in West Lindfield, Sydney. Left to right, Chief of the Division, Dr Bill Blevin, Mr Peter McGauran, and the Manager of the Applied Electricity and Magnetism Program in the Division, Dr Barry Inglis.

Study of Fishermens Benders shows no hangovers

The results are in from the medical survey of past and present staff of CSIRO's Fishermens Bend site. The survey was commissioned in 1989 after radioactive contamination was found there.

The survey found no evidence of long-term health damage from the contamination.

However, participation was voluntary, so only 152 staff were checked. Also, most of these were staff who 'would have had intermittent exposure to material stored or distributed about the site' rather than those 'involved in crushing radioactive ores'. Apparently 'only a few' of the latter were examined.

Any staff who would like more information should contact Warren Smith, Manager, Occupational Health and Safety. His number is (06) 276 6440.❖

Kudos and more kudos

Dr John Stocker, Chief Executive of CSIRO, has been awarded Fellowship of the Royal Australasian College of Physicians.

Dr Derek Lindsay, a Senior Principal Research Scientist at the Division of Tropical Animal Production in Rockhampton, has been elected Deputy Chancellor of the recently proclaimed University College of Central Queensland.❖

SIROCREDIT

Buying and selling shares — SIROCREDIT can save you money

You expect your own financial institution to be able to provide all the services you require, and at SIROCREDIT we strive to make sure this is always the case. Owing to many member requests SIROCREDIT has introduced a stockbroking referral service so that you can purchase shares at a discount.

In fact you save 20 per cent of the normal share brokerage charge whenever you trade through SIROCREDIT's referral service, and that discount is directly rebated to your credit union account.

Important — SIROCREDIT does not recommend or participate in share or equity trading with members' funds in any way, and provides this referral to a stockbroking firm only in the interests of those members wishing to individually invest in the stock exchange.

To contact the SIROCREDIT stockbroking service, ring (03) 483 or (008) 338 698.

As SIROCREDIT has arranged to have one individual stockbroker to act on members' behalf, all shares traded are actioned via the Melbourne Stock Exchange.

ARE YOU GETTING THE MOST OUT OF YOUR EMU?

The Energy Management Unit (EMU) was established in December 1984 to control spiralling energy costs within CSIRO and the financial restrictions these costs cause, which affect the ability of CSIRO to carry out its primary function — scientific and industrial research. Divisions using the services of the EMU retain the energy cost savings. The Unit's excellence received recognition when it won a certificate of merit in the 1988 National Energy Innovation Awards.

EMU is available to all CSIRO sites, to carry out comprehensive energy audits, provide advice, guidance and assistance and promote awareness of the benefits of energy conservation and management.

EMU prepare reports providing details of energy consumption, estimated savings achieved through energy management programs, and identification of potential savings and goals for future years.

If your Division is approached by commercial 'Energy Management Consultants' with contracts in hand and promises of large savings, treat those promises with suspicion. To be sure of the claims, refer any information to the EMU, to analyse the contracts and verify any savings. You may find that you are already receiving the services they are proposing!

EMU is a service, at the disposal of all CSIRO sites, and its staff travel interstate extensively. If you are considering energy management, then your first contact should be the Energy Management Unit!

❖❖❖

Contacts

John Anderson
Manager
Energy Management Unit
Meat Research Laboratory
Cannon Hill QLD 4170

Ph: (07) 399 3122
Fax:(07) 399 4557

NSW
Greg Morgan
(02) 887 8333

VIC
Bruce Nicholson
(02) 557 6172

WA
Chris Sentance
(09) 367 7261

***CoResearch* is produced by the Public Affairs Unit for CSIRO staff and interested outsiders. Readers are encouraged to contribute or offer suggestions for articles. Stories may be reproduced, provided acknowledgement is given to both *CoResearch* and CSIRO. The deadline for contributions is the 15th of each month, but earlier is better, as issues fill up fast. Editor: Liz MacKay, PO Box 225, Dickson ACT 2602. Phone: 06 276 6567. Fax: 06 276 6641.**

CoResearch

No. 335 October 1990 CSIRO's staff newspaper

CSIRO AUSTRALIA

New award granted

CSIRO's decision to bid separately from the rest of the public service for its new award package has paid off. The new award comes into force on 11 October, bringing with it average salary increases of 12.1 per cent, with a high for some scientists of 19 per cent. Assistant General Manager of the Human Resources Branch, Ms Carmel McPherson, told *CoResearch* 'we are the only organisation that got this scale of increase from the Industrial Relations Commission'.

Commissioner Griffin of the Industrial Relations Commission took the unusual and unexpected step of provisionally granting CSIRO's application as soon as the work value hearings concluded, and on 25 September that decision was formally confirmed.

The witnesses CSIRO sent to the work value case were of a very high standard, and the Commissioner commented that she had never come across a group so articulate and talented.

Ms McPherson said, 'We don't believe we took a selected slice for those witnesses. It was a real slice of CSIRO. The talent was all there'.

The other reason the Commissioner was willing to hand down such large increases, according to Ms McPherson, was that it was 'an integrated package, not just a salary grab'.

Director of Corporate Services, Mr Peter Langhorne, said it was important that staff be made aware that the salaries agreed to were only one component of this integrated package, which will be underpinned by Performance Planning and Evaluation (PPE) and the Enhanced Merit Promotion Scheme (EMPS).

General Manager of Human Resources, Arthur Blewitt, told *CoResearch* that the new package meant 'incredibly enhanced career opportunities for people. There will now be scope [under EMPS] for admin staff [i.e. not only scientists] to 'grow their jobs', and not have to move constantly to get the right pay'.

But under PPE, which will replace the present PRD, staff will also be more accountable. Increments will no longer be automatic, but will be tied to performance, as will promotion.

The new structure will place staff in nine levels, not counting the two top levels reserved for the Chief Executive and the Directors, and staff above level 7 will be made accountable for performance by use of term promotions.

'So in effect there's been a trade-off for the higher percentages for those people. They really have to perform or they don't stay at those levels,' Ms McPherson said.

Mr Langhorne said implementing the new structure would cost between $20 and $25 million in the first year, but the Federal Government had agreed to bear the initial cost.

Further funding for the changeover will not be finally decided till negotiations for triennium funding take place, but Minister for Science and Technology Simon Crean has told *CoResearch* that he will support CSIRO's claim, if necessary.❖

(more on page 7.)

STOP PRESS

On 2 October CSIRO Chief Executive Dr John Stocker and Queensland Resource Industries Minister Ken Vaughn announced final agreement to establish a $16.5 million centre for advanced technologies at Pinjarra Hills on Brisbane's western outskirts.

The centre will concentrate on research in mining and energy resources and civil engineering and will become the new headquarters for the Division of Geomechanics.

Under the 25-year agreement the Queensland Government will contribute a $20 million financial package to build the centre, relocate staff and equipment and buy an advanced computer facility.

Construction is expected to begin in late 1990 and take about 15 months.

CSIRO gains second research vessel

At a time when we are reaching the limits of our known resources the work that can be done by CSIRO's newly acquired research vessel, the *Southern Surveyor,* may be vital, according to Minister for Primary Industries and Energy, Mr John Kerin.

Mr Kerin was speaking at the commissioning of the renovated vessel on 27 August in Hobart.

He said the vessel was particularly suited to exploration of the deeper waters of the oceans, which was where we would have to look for new resources.

The total cost of buying, converting and equipping the vessel was close to $16 million, of which CSIRO paid $7.3 million to augment funds of $8.7 million made available by the Department of Primary Industries and Energy.

Until the commissioning of the Southern Surveyor, CSIRO had only one research vessel, the RV *Franklin,* operated by the Division of Oceanography.

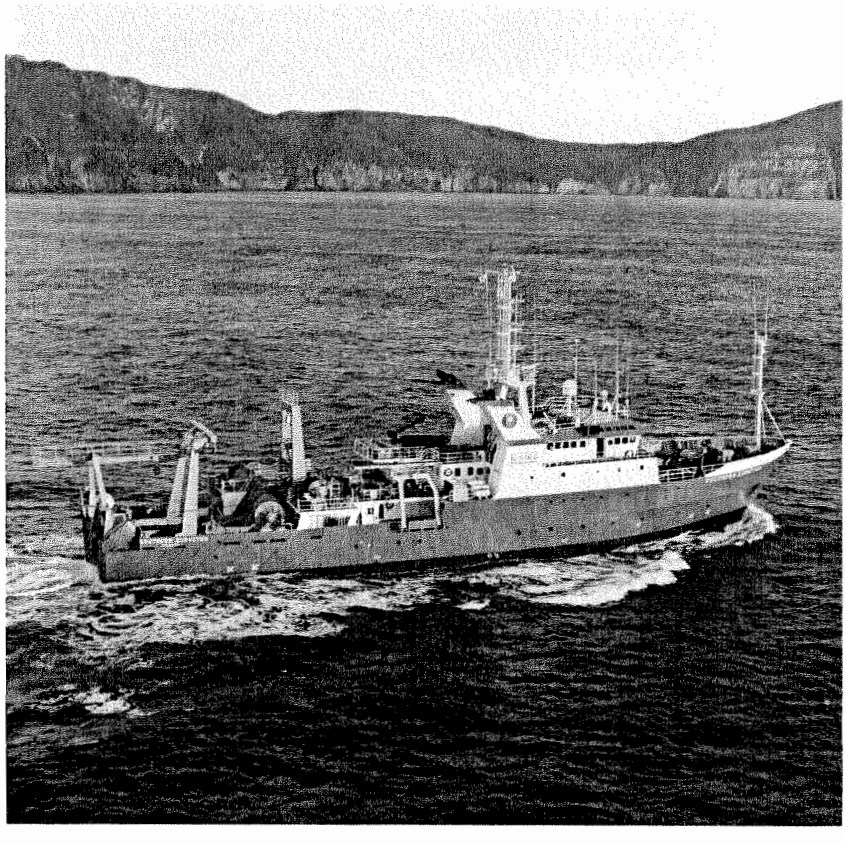
Now that the Division of Fisheries has its own vessel it plans to carry out much-needed research, including a survey of Tasmania's orange roughy resources in June and August next year.

From 18 September to 17 October *Southern Surveyor* will be working on the North West Shelf under Dr Keith Sainsbury, a Principal Research Scientist at the Division of Fisheries, as part of a program begun in 1985.

This long-term program is aimed at helping to develop sustainable domestic Australian fisheries in an area that was previously fished by foreign trawlers.

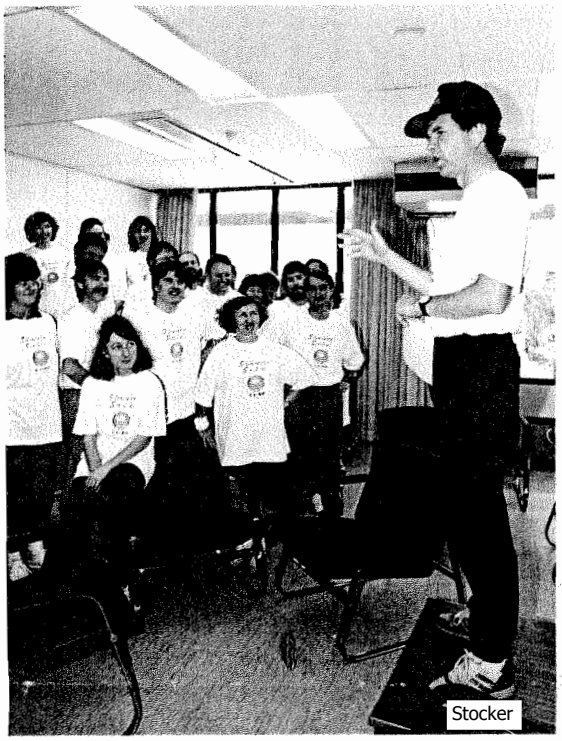
The vessel will also be used to conduct studies of fish resources in the Gulf of Carpentaria and along Australia's continental slope from Albany to the Northwest Cape.

The *Southern Surveyor* is 66m long with a gross tonnage of 1,594t. It is fitted with sophisticated scientific equipment that will allow it to work in the 200 nautical mile Australian Fishing zone, the Indian and Pacific Oceans, the Southern Ocean to 60° south and as far west as Heard Island.❖



Just so it can't be a case of the Emperor's new project ...

This issue of CoResearch officially launches Project Ambassador, and Dr Stocker here offers an overview. The photo is by David Salt of Education Programs.



I haven't forgotten that I promised to talk about Project Ambassador in this issue. You, on the other hand, probably *had* forgotten, until you were reminded by having a leaflet with that title, printed on grayish recycled paper, slide treacherously out of your copy of *CoResearch* and catch an updraft to the one unreachable spot under your desk. All part of our carefully planned strategy to gain your attention and engage you emotionally from the start!

Anyhow, many of your questions about the project will be answered in that leaflet, so my comment here will be brief and general.

CSIRO has an enormous obligation to the people of Australia who support it, and have supported it since its inception. However, there is a perfectly proper trace of self-interest in that obligation: we need to explain to the Australian public that what they're giving us is not a grant to enable scientists to pursue their strange intellectual pleasures, but an *investment* in this country's future.

That claim will be convincing only if we can give some concrete examples of how the money spent on Australian science and technology, and particularly CSIRO science and technology, has paid off in lifting Australia's performance.

The first step in Project Ambassador is to arm our people — all 7,000 strong — with the information they need to tell an impressive and convincing story to whatever group they choose to deal with.

The project has many potential benefits. The first is, certainly, to demonstrate to Australians the high return the nation gets for its investment in CSIRO. We do not ask for grant money, but for *investment;* and there are few, if any, areas from which taxpayers get a better return than they do from CSIRO. That return can be measured in profits, in protection of the environment, and in improved well-being for Australians.

A second benefit is that we will again be doing something together, as we've been doing already with the priority-setting exercise. That is good for us too — it demonstrates that we can move as a single, integrated body, from planning through to successful conclusion.

A third, and very important, benefit, is to determine a good outcome in our negotiations for triennium funding; and the project is well-timed to help us there. However, I wouldn't want to put that as the main goal, for all its urgency, because it really isn't. If the government told us tomorrow 'Right, you can have all the funding you've asked for', I'd still want to go ahead with Project Ambassador.

But the project is broad not only in its vision; it is also broad-based. I feel a personal obligation to do what I can in this, and I've also invited — in writing — each member of the CSIRO Board to make individual contributions and to approach particular important and influential Australian groups on our behalf. The same applies to Institute Directors and Chiefs, and, indeed, to all people in the Organisation. I believe that by adopting this very broad-based approach — given our geographic distribution and our position of respect in the Australian community — we're likely to be able to make quite a big splash.

I have been pleased and stimulated by the responses of staff as I've moved around the Organisation and spoken to large groups of them about Project Ambassador. One excellent suggestion made by Henry Armstrong, a Technical Officer at Radiophysics, was that all our publications might include a list of CSIRO achievements, in a box, on the back. There would be maybe a dozen or so examples that people could relate to, and because we publish so much material in different forms it would be a very good way of driving home the message. We would update it from time to time, and it would come to be identified with us almost in the way a logo is, though using ideas instead of images. I'm taking it up with Public Affairs at the moment, and that's a direct result of this stimulating suggestion from a colleague. Keep them coming!

Letters to the Editor

Dear Ms MacKay,

I was somewhat disappointed at the degree of insensitivity shown by the heading of the article on Page 6 of *CoResearch* issue 334 (September 1990) dealing with the Japanese consumer project. *[Ms Popham refers to the heading 'We like it, but is it trury dericious?']*

Whilst I am all for journalistic licence and catchy headlines, in this case I wonder did you contemplate the possible repercussions for CSIRO.

Under the anti discrimination thrust it is considered 'no go' to send up other people's disabilities and the inability of the oriental tongue to cope with the English 'l' sound is not, in my view, suitable grist to your journalistic mill.

What if the sensitivities were such that the future funding and co-operation for that project were damaged? Would you apologise to the staff who lose employment because of it?

Perhaps next time you may like to look beyond the 'cute' and consider the potential outcomes of the material.

As editor, even if it was a submitted article, the buck still rests with you to negotiate changes with the author.

Let us be in no confusion as to the power of the pen — *CoResearch* is a widely read journal and the reputation of CSIRO rests as heavily on it as on anything else.

Please — let there be no next time.

CSIRO is under enough pressure as it is — let's not invite adverse comment purely for a catchy headline.

Yours sincerely,
Carole E. Popham,
General Secretary, CSIRO Technical Association

cc Patricia Quinn-Boas

Dear Ms Popham,

I would certainly be saddened to find that I had offended any group, Japanese or otherwise, but do you not think you are being a little quick to take offense on their behalf, and in doing so perhaps adding a new insult to the one you think you see in my headline?

It had not occurred to me, until I got your letter, to think of people's accents as 'disabilities' of any sort, any more than their hair colour is. I myself have a strongish accent, and indeed, now that I think of it, so do many of my friends and workmates. While it may be seriously *corny*, do you really think it seriously *offensive* to represent a Scottish accent, for example, by writing 'Aye, scrrrumptious, to be surrre!', or a French one by 'Zee flavour ees, 'ow you say, yommee'? Or an Australian one by 'Jeez mate, this poi's orroight!'?

If it is, bang goes a big chunk of our literature, serious as well as comic, not to mention much of children's television, some delightful comedy shows, and Paul Hogan's stunningly successful overseas tourist campaign. Among countless other national treasures.

Things might be different if there were any hint of contempt or criticism in the article itself, but since there is not, surely the only person who would take offense would be one who already thought of a 'foreign accent' as a *defect* of some sort, rather than simply a difference.

I think such a negative view misguided and impoverishing, but believe it to be well up on the endangered species list, and pray for its speedy extinction.

Please feel free to continue this debate, as the questions it raises have application beyond this one case and would be of interest to *CoResearch* readers.

Yours sincerely,
Liz MacKay
Editor, CoResearch

cc CoResearch readers

[Until a few days ago, Ms Popham's was the only response I had received on the 'trury dericious' headline. However, on the evening of September 17, Stuart Littlemore singled it out for comment on his ABC television program 'Media Watch', where he linked it to wartime 'Phantom' comic strips in which the enemy Japanese forces featured as hated 'Japs' and 'Nips'. Of course I think my lighthearted headline almost the opposite of that sort of deadly earnestness, and indeed a sort of antidote to it, but it is surprising how many people have since decided to let me know that they agree with his 'implication' that my choice of words was 'racist'. Having seen the item, I doubt if that was Mr Littlemore's implic-

ation, but I certainly welcome letters on the subject, which I think a genuinely interesting and important one, potentially. Ed.]

Dear Editor,
The following appeared in my computer printout the other day. I assume that the ethereal equivalent of Telecom has goofed. However, since it may be of interest to your readers, I am sending it along.

P.J. Ross
Division of Soils

Report from CSIRO Division of Applied Contemplation

It may come as a surprise to many that CSIRO encompasses a Division of the above name, but management initiatives since the Vatican decree that monasteries should seek 30 per cent of their funding from outside sources led first to a partnership proposal and then, on 1st April this year, to the formation of the above Division. Our charter is to raise the standard of the Australian Economy by applying known principles of transcendental science to the monasteries for their advisory role in directing us towards current needs and unsolved problems in, for example, production of persuasive Mission Statements and Political Crystal Ball Gazing.

We see an expanding role for contemplation, particularly meditation-based contemplation, in Australia. Trade Unions, the Tourist Industry, and recreational fishing interests have already approached us offering to co-operate in research and development efforts. On-the-job meditation, contemplative assimilation of our relatively unpolluted environment and sea-and-sky relaxation packages should have positive staff-relational, economic and consumer benefits. A software package for computer-aided meditation (SIROMED) is under development, and if all goes well version 1.0 will be offered to local churches, high-flying business executives and CSIRO scientists with increasing management responsibilities in the New Financial Year. Nor are we neglecting political aspects, since we know from several thousands of years of experience that the political environment in which we operate cannot be ignored — interest in SIROMED has been expressed by more than one parliamentarian for use on a laptop computer during Opposition speeches.

I can assure you that, as usual, CSIRO can be proud of the exalted standards we are setting in our staff and research. We are developing a true Centre of Excellence, and hope thereby to attract funding from similarly exalted sources, like the Australian Treasury. Visiting yogis from India, Japanese Zen Masters and Vatican diplomats keep our science truly international while we are negotiating an exchange agreement with Theravadan Buddhists in Thailand. As well as publishing in reputable international journals such as Transactions of the Association for Applied Meditation, Contemplation Chemistry and the Journal of Simulated Experience, our scientists are launching our own local Australian Journal of Cosmic Consciousness where such issues as the great Australian dream, managing our lucky country with responsible economics, and football finals can be discussed.

Therefore, all you despondent scientists in CSIRO, don't be dismayed. The Organisation is Meeting The Challenge. And now that we have budget cuts again, write for our free brochure entitled 'Vows for Australian Scientists — Poverty and Obedience'

DOM Isaac Instein, ThD
Baghwan, Division of Applied Comtemplation

Dear Editor,
It's surprising to find people within the communication area of CSIRO still insisting on using a wrong version of the reversed logo. A few days ago I happened to be in the Government Publishing Service (AGPS) bookshop and there under the banner 'CSIRO Publications' was a wide range of glossy and expensive publications. Unfortunately three of these products carried the infamous wrong logo. I can only imagine the confusion on the faces of our more observant patrons at the inconsistencies in our own treatment of our corporate image.

To try to make the issue clear the right use of the reversed logo is shown below.

Further information on the use of the logo can be found in the Corporate Identity Manual, page 2.1.

Brian Gosnell
Chief Graphic Designer
Communications Institute Support

REVERSED LOGO

WRONG RIGHT

Max Whitten helps the Russians beat their guns into ploughshares

Human control agents in the USSR may be a dying breed, but it looks like their opposite numbers in the insect world are in for a population explosion. CSIRO and the Soviet Union have just signed a 'memorandum of understanding' that will greatly smooth the way for co-operation in the development of biological control agents, through collection and exchange.

Dr Max Whitten, Chief of the Division of Entomology, CSIRO, and Nicolai Philipov, of the All-Union Institute of Biological Control Methods of Plant Protection, in the USSR, have been looking into the opportunities offered by the memorandum, and the new lines of commuciation are really beginning to buzz. On 8 August 1990 the first batch of parasitic wasps collected in the Southern USSR were released in NSW as part of a pro-active biological program — the first of its kind in the world — against the day the Russian wheat aphid arrives in Australia.

Recently Dr Whitten was in the USSR to address a conference on pesticide reduction at Kishinev, Moldavia, and on his return he agreed to give CoResearch readers this short but eye-opening glimpse of the rural science scene in Russia, and its urgent importance to us.

In 1960, some 36 million hectares of soviet crops were sprayed with pesticides. By the time this year is out, 170 million hectares will have been sprayed with over 300,000 tonnes of chemicals, some of which will flow into the river systems or leave residue in the crops.

Without pesticides, soviet pests would destroy 20 million tonnes of grain, 19 million tonnes of beef and 6.6 million tonnes of vegetables. In a nation already plagued by food shortages, some crop losses are as high as 60 per cent. Last year, the USSR spent two billion roubles on pesticides, a financial and environmental price that many Russians feel is far too high.

At a recent Food and Agricultural Organisation (FAO) conference I attended in the USSR, Academician K.V. Novozhilov, Director of the All-Union Institute for Plant Production, admitted that, in 1985, pesticide contamination of food had been as high as 18 per cent (although it has since been reduced). He went on, 'outlays for plant protection speed up faster than productivity in plant industry'.

The USSR is about to join the FAO, partly to gain access to expertise in integrated pest management. Since Australia has developed many of these techniques, I was invited to talk about the CSIRO Division of Entomology's work. It was ironic that I should be talking to soviet scientists about our research on genetic control of the blowfly — this research, it transpires, had a counterpart in the USSR in the 1920s.

The story of how some brilliant Soviet genetics research was suppressed because it did not fit a political agenda is too long to go into now — suffice it to say that it was this sort of interference that contributed to the decline in Soviet agriculture. That aside, the USSR has still managed to develop major strengths in biological control.

Around 1,700 mass-rearing factories across the USSR churn out some 20 species of natural enemies and pathogens of insect pests, albeit with antiquated technology. Soviet plant breeders have successfully selected pest-resistant plants, and chemists have characterised sex pheromones that regulate mating behaviour in 70 pest species.

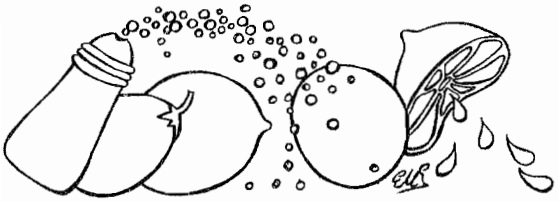
There are several areas for possible Australian–USSR collaboration: pheromone research and stored grain are obvious, as would be collaboration in biotechnology, genetic engineering and modern mass-rearing technology. An added bonus would be access to biological control agents, especially to counter the Russian wheat aphid, which will cause havoc if it reaches Australia.

Clearly the USSR's agricultural research base is bankrupt. I saw some powerful electron miroscopes and other equipment for chemical analyses. But word processors, photocopiers and fax facilities seem almost non-existent. The abacus is still used to tot up accounts! These shortcomings are recognised by soviet scientists who openly voice their frustrations and call for collaborative links overseas.

Of course, much of this impinges on commodities where the USSR could be a competitor: the commercial implications for co-operation would need to be thought through. However, any country that goes down the path of non-sustainable agriculture ultimately represents a biological and political threat to us all. The bottom line is that we cannot afford not to collaborate with them.❖

A Matter of Opinion

In this year's May edition of CoResearch (No. 332) Dr Ralph Young of the Corporate Planning Office offered a spirited rejoinder to Barney Foran's attack on economists, which appeared in the February–March issue (No. 330). Dr Young accused Mr Foran of 'succumbing to the temptation to kick the butts of economists by blaming them for all the perceived ills afflicting his discipline.' He claimed Mr Foran 'added some lemon juice to the acid by assigning to the economists the responsibility for fixing things up'. He also asked Mr Foran how he would respond if offered a choice between $10,000 now and $10,000 in five years time. If he chose to take the money now, Dr Young contended, then he too was 'discounting the future'. 'We have a preference,' said Dr Young, 'to eat, drink and be merry now, rather than in the future. ... And that is what the discount rate represents — the reward that we require for putting off our pleasures.' Below, Barney Foran replies to the reply —



A bit more salt ... a bit more lemon ...

... or, now that we've found an articulate economist we'll apply a discount rate of 50 per cent to anything he says.

Of course I took the money! $7,000 in fact! But I didn't splurge it on wine, women and song as Dr Young would have me do, because of my uncertain future. I invested it in Australian blue chip stocks. $2,000 on BHP because they are about Australian industry, diversification and they're in it for the long term. $2,500 on National Australia Bank because they give fully franked shares instead of cash dividends. Money's just a drug; there's no such thing as security.

The long view suggests that Australians should be saving and investing more and buying less spa baths, rather than ineptly pondering over our uncertain and declining future. My rather general reading on the Japanese economic miracle emphasises that the long term was paramount. They saved, they invented and they developed. The video recorder et al. had development profiles of 12 to 15 years. Try buying that cash flow in the good old spreadsheet and doing a nett present value with a discount value of 10 per cent. Doesn't add up does it, especially in a country where real estate and weekend punters are king.

It's not, Dr Young, that discounting of the future does not exist. My disenchantment with discount rates rests in the way that inept middle management and self-serving analysts use them. Far too often I have seen agricultural development proposals which spend 90 per cent of their effort detailing the sensitivity of cash flows to a range of discount rates, rather than examining in similar depth the climatic and biological risks that form the very core of the ability to generate the cash.

As the Gucci-shoed director of a nobby consulting firm said to me a year ago, 'We do this, that, analyse the trends (i.e. 6 months of work) and then we *put it through an NPV with a discount rate of 10 per cent*. Our investment decision is made with a maximum three-year time frame'. He was dealing with an agricultural enterprise with a minimum internal time frame of 6 years (an animal breeding enterprise), operating within a 10 to 20 year climatic cycle. Why not just generate random numbers and use a system of mirrors? The ancient Egyptians did pretty well using such mixtures of economics and herbalism.

I'm not too influenced by Dr Young's rhetoric on intergenerational equities. It wasn't elegant economic theory and analysis that led to the Coronation Hill and Wesley Vale decisions. Rather an 'india-rubber backed silver-maned budgie' sniffed an acute electoral advantage. He applied an 80 per cent discount rate to an anticipated power and junket profile, should he not do the 'some of my best friends are greenies' bit. We are surrounded by the realities of the arse falling out of agricultural and ecological systems *within* generations. Discount rates in every spreadsheet (yes good old Lotus and Excel) allow every accountant and bank manager to be an expert on future sustainability. The instant application of such discount rates occurs with less philosophical rigour and real life validation than one of us biological types would apply to the design of a fertiliser trial. Yet with much larger consequences!

Now I'm waiting for the next cut and thrust that argues the money to be spent on cleaning up the Murray-Darling system (billions), or on the Decade of LandCare (tens or even hundreds of millions) should be added to the GNP. As a research scientist forever strapped for cash, I could only ruefully admit the advantages of the green chickens finally coming home to roost. Therefore by full circularity of argument, I should argue for more degradation, which gives more problems, and more research dollars and thereby (if I play my cards right) more dollars for me ... more wine women and song ... ripper!

As Dr Young rightly points out, we have much common ground. We too applaud the use of bio-economic models such as the West Australian 'Midas' or La Trobe's 'Dumsday et al'. It's always a wonder that the results from such models receive scant attention from the real decision makers and their discount rates. A fascinating insight into the unpalatable results they sometimes produce was provided by one of the keynote speakers at this years ANZAAS congress. Because of the inelasticities in the price/supply equation of wood from our south-east forests, we could bung up the price and put more stringent environmental requirements on the extraction methods. And it would mean more jobs in the region, not less.

Dr Young and fellow discounters of the future will be pleased to know that our Division's RANGEPACK whole enterprise model is a leader in its field (pastoral sheep and beef production). It is being used widely at farm and policy level, both in Australia and overseas. We've even got discount rates in it, because the consultants who use it feel a bit bereft without them. So if we do spend a week with them detailing all the wonderful biology, read a hundred papers on the agricultural technology, analyse the climatic risks posed by drought and then produce detailed cash flows on ten development scenarios, they too can put it through the NPV, and reduce all this work to one meaningless index.

But where to from here Dr Young? Your testimony of luminary economists who have written much, but have slow uptake and implementation of the succinct ideas, must stimulate the old ego in this last decade of the century. CSIRO should have more to say on how to reconcile the economy and the environment. Should the development and extraction of our forest industries be included in both our GDP and GNP (see IMF Survey 4.6.90)? The UNDP has developed a 'Human Development Index' with which it tempers GDP per capita with life expectancy and literacy rates (IMF Survey 18.6.90).Perhaps we in Oz should temper our high rating (7th from the top) with a Polluters Stakes that sees us third in the OECD in the emission of greenhouse gases per capita (The Economist 16.6.90). Or should we embrace Dr Young's love of discount rates and keep ripping into our forests like our nearby Asian neighbours (Far Eastern Economic Review 7.6.90) and try to mimic high economic growth rates?

My original *CoResearch* offering attempted to enthuse like-minded CSIRO brethren to get out amongst the business community and romance them with the wonderful studies we spend much of our lives living. The aim is to influence policy, rather than react to it. The traditional scientific approach is, 'give us your problems and we'll find a solution'. However, comment from the concrete block on the hill concentrates on a few throw-away lines, rather than the essence of communicating where the real decisions are made.

Perhaps I'm not such a good communicator after all.❖

Twin honours to Radiophysics

Two staff members of the Division of Radiophysics have been recognised for their outstanding work. Kaye Griffiths has won a Churchill Fellowship and Minh Huynh has won the Arthur Frost Memorial Award for Apprentice of the Year.

Ms Griffiths is a research ultrasonographer at the Division's Ultrasonics Laboratory in Chatswood, Sydney. She has a great deal of experience in conventional Doppler examinations but lacks access to new clinical applications being developed overseas.

The Fellowship will allow her to visit universities and hospitals in America, England, Yugoslavia and Holland from June to August 1991.

'I'll be investigating the diagnostic potential of their technology,' Ms Griffiths said.

Mr Huynh is a fitter and turner. He programs and operates CAM (computer aided manufacturing) machines, and CNC (computer numerical control) machines in the Division's workshop.

He arrived in Australia as a Vietnam 'boat person' in 1981 when he was only 13, and began his apprenticeship at Radiophysics in 1986 after completing the first year of a Fitting and Machining course at Sydney TAFE college.

Mr Huynh has achieved remarkable success despite the great cultural and language barrier. At school he won an award for coming first in Industrial Arts, and at TAFE he won numerous awards, including the award for coming top of the class in his Fitting and Machining Certificate course.

'Minh is no ordinary apprentice,' said his supervisor, Keith Hodgson. 'He's an extremely quick learner.'❖

Kaye Griffiths, Churchill Fellow

Minh Huynh, Apprentice of the Year

Please supply: soapboxes, 7,000

Readers will have noticed a slim and rather glamorous insert in this month's CoResearch, titled 'Project Ambassador'. That insert — and Dr Stocker's column on page 2 — will tell you something about how the project is supposed to work, but how do the ambassadors themselves actually feel about it? David Mussared of the Public Affairs Unit at Corporate Centre did a bit of a ring-around to find out.

Project Ambassador is a good idea and deserves the support of all staff — but it's going to have to happen fast.

That's the reaction of CSIRO Officers' Association vice-president John Stephens, who told *CoResearch* the negotiations for CSIRO's next three years of funding would be all over by Christmas.

'I welcome it as an essential initiative in today's political climate,' Mr Stephens said.

'The Officers' Association will be supporting it vigorously, and urging its members to do likewise.

'The triennium is in essence our largest contract. Whether we grow, merely subsist or shrink depends heavily on the outcome. But the time frame for action is short, because the outcome is likely to be decided before Christmas.

'I will be approaching all my personal contacts throughout the community as well as participating actively in the Officers' Association's efforts.

Division of Plant Industry chief Dr Jim Peacock also said the Project Ambassador idea was a positive move, although most CSIRO employees already acted as ambassadors for their organisation.

For example, he said, he always wore a CSIRO badge in his lapel, and it often started conversations.

He said most CSIRO researchers were proud of their organisation and could speak positively about it.

'That is an important point, I think — rather than whingeing or moaning, to speak positively,' he said. 'And I think a lot of them do, even though we've never called it Project Ambassador.'

He said there was a danger whingeing could be 'overdone' because resource shortfalls or similar problems were very much on people's minds.

'It's very easy to talk in a positive way because there are so many positive things,' he said.

'I feel that for this Division at least we've very little cause to be whingeing. I'm really extremely positive about what we're doing.'

He said the effect Project Ambassador might have on the Budget decision was also important. 'The cultural climate with respect to science is still changing, I think, in favour of the need for research and how important it is for our future," he said.

Helix Magazine editor David Salt said Project Ambassador would help to put a human face on the CSIRO and on science generally — something that had been lacking.

'People don't see the humans; they just see the products,' Mr Salt said. 'I think in that depersonalised state science is not as attractive, and it's not as real.'

He said Project Ambassador would tend to make people think more about their organisation, which in turn would give them more pride in their work.

'Enthusiasm breeds enthusiasm,' he said.

'I feel that CSIRO is very much something to be proud of and that we should be displaying that pride to others.'

He said the Double Helix Club would benefit from the project because it was a tangible thing people could support.

Division of Soils communicator Cathy Sage told *CoResearch* she thought the Project Ambassador plan was 'absolutely bloody brilliant'.

'Saying it makes it happen,' Ms Sage said. 'Having a commitment to the organisation, and saying things that are positive about it, makes it happen in your own mind as well as in other people's minds.

'I think anything that cements CSIRO into a single aim that's worthwhile for Australia is good.

'CSIRO's job is to offer service to Australia. I'd say that it's important that the public see that we are excited about giving them service and excited about what our organisation is.

'I think you can't just have communicators doing it.'

However, she said the Project Ambassador leaflet should spell out a bit more what it wanted people to do.

'It asks people to make a big effort, I think, she said. If it's not easy they won't do it.'

Ms Sage said the leaflet should instead suggest the easier things first, and offer the harder options as extra avenues if people wanted to take it further.

She said the advice should be instead to 'do as much as you feel like doing; it all makes a difference'.

However, she said the suggestion to make use of casual encounters was 'great' — and it should include telling your own family.

'I've got 17 first cousins, for heaven's sake,' she said.

'They know that I really enjoy my job and they think differently about CSIRO than if I didn't.'

Ms Sage said she especially liked the list of CSIRO's 'greatest hits'.— although she wondered about including myxomatosis on the list.

'Myxomatosis is a good example of why we need to keep on researching,' she said.

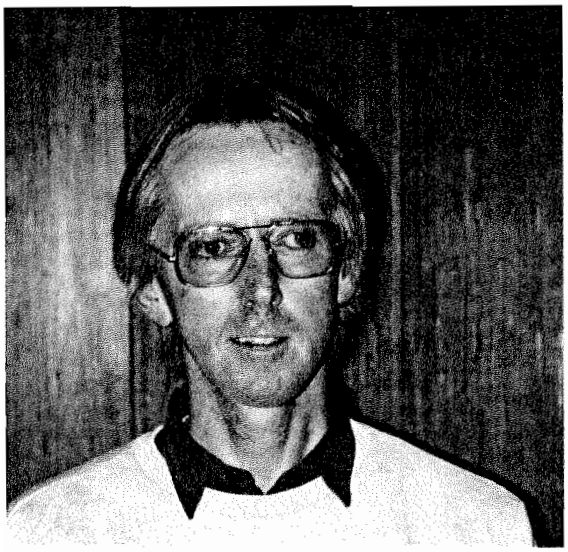
She said the bottom line was that Project Ambassador should tell people they had the power as individuals to make changes. 'It's up to you what you make of your own organisation,' she said.

Federal Science and Technology Minister Simon Crean told *CoResearch* he welcomed and endorsed any move like Project Ambassador that would boost public awareness about CSIRO.

'I think it's very important to promote the achievements of CSIRO,' Mr Crean said. 'And the other important thing is to promote the *potential* achievements.

'I think that part of this problem of 'under-realising the asset' is that there just isn't enough broad awareness out there as to either what CSIRO has done or what it is capable of doing.'❖

Forestry scientist wins coveted international award



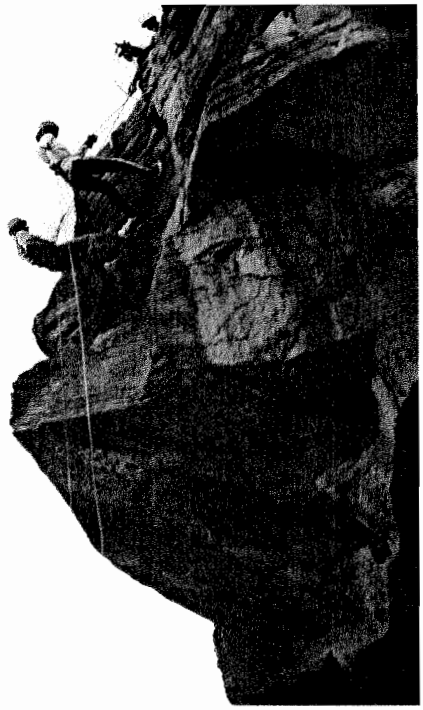
Dr Ross McMurtrie of the Division of Forestry has won the prestigious Scientific Achievement Award of the International Union of Forestry Research Organisations. The announcement was made at the Union's World Congress in Montreal on 6 August.

The Award recognises Dr McMurtrie's unique and outstanding contribution to process-based models of forest growth, a complex and relatively new area of forest research.

The work was an important outcome from a major multi-disciplinary research project by CSIRO to examine how water and nutrient interactions influence forest growth in the Australian environment.❖

Life at the top

What do you do when you get there?



What is leadership? Is it strength of character? Single-mindedness? Hypnotic power? The ability to leap tall in-trays at a single bound? And above all, if you lack it, can you learn it? The Employee Development Unit is betting you can, though you might not manage it in an afternoon or two, and you might come out of it not only stimulated, but positively breathless. Dr Noel Barton, a Program Leader at the Division of Mathematics and Statistics, offers a brief account of his recent plunge into the CSIRO Research Leadership Course on offer at the Institute of Administration at Little Bay in Sydney.

CSIRO has run quite a few major leadership courses at the Institute before this one that I'm enrolled in, but it's new to me, and very interesting.

There are twenty-nine CSIRO scientists all told, most of them Program Managers. They present quite a crop of personality styles (some readers might be able to guess who they belong to) — including the Napoleonic, the Ebullient, the Watchful, the Cynical, and the Rustic.

Some concerns keep coming up time and time again, especially the need to adapt to the new role of CSIRO, and how hard it is, on an individual level, to make the transition from scientist to manager.

One or two of the topics have led to hot debate over relevance. The 'team challenge' exercise, in particular, needed some pretty hard selling before it finally squeezed majority support out of us. But I must say that when it did happen it offered a rare chance to do unusual things — like abseiling and crossing a rope bridge — and I for one was pleased to share such experiences with senior colleagues.

Naturally, the quality of the sessions has varied, but the good ones have been very valuable indeed. Personally, I got the most out of the sessions on media training, conflict resolution, performance counselling, and economic evaluation of research.

The course provides new knowledge and skills, and a forum for the interchange of views. It does not involve assessment, in any formal sense, of the participants. The courses are organised by the Employee Development Unit of the Human Resources Branch, and they generally take a modular form, with about four modules, each of about four days. It's interesting, it's fun, and it seems to be working. Three cheers — across the cliff face — for Bob Marshall, Martin Smith and Kerry Habel. ❖

Post-budget fun run

Elaine Cooper (opposite) of the Division of Plant Industry was First Woman Home in the Department of Finance's annual Post-Budget Fun Run held in Canberra on 24 August.

Beverley Milloy of the Division of Water Resources was the eighth fastest woman overall.

No CSIRO men placed in the first ten, but our fastest was Mick Crowe of the Division of Forestry and Forest Products.

The CSIRO fielded an impressive team of 140 runners out of a total field of 1,146 for all of Canberra.

Dr Stocker ran, leading his people not, as he had predicted before the race, from behind, but admittedly from somewhere around the middle.The event raised $3,750 for the Salvation Army and the Smith Family.

Fellow staff to the rescue!

Marcella Mortison in the Division of Tropical Crops and Pastures, Cunningham Laboratories, Queensland, needs a

card for an Apple IIe computer

(12 bit, 16 channel, 9 gain, A/D)

Would anyone who can help please call Dr Peter Kerridge on (07) 3770280 or Mrs Marcella Mortison on (07) 3770310, or fax (07) 3713946.

Student research spreads to the West

Above, left to right, Cooper Smith, Fiona Cresswell, Bradley Patterson and Clare Anthony. Mr Patterson is an Experiemental Scientist with the Division of Water Resouces in Perth, and the others are students who have just won places in the first Student Research Scheme for Western Australia. Until now the shceme has operated only in the ACT, where it is a joint project conducted by CSIRO and the ACT Schools Authority. The West Australian arm of the scheme was officially launched on 13 August at CSIRO's Floreat Park site. Under the scheme six students, selected by their teachers on the basis of interest, responsibility and ability, will have the chance to work on a real research project under the guidance of CSIRO scientists. Photo by W. van Aken, Water Resources.

More about the new award

CSIRO's new award restructuring package has three key elements, the nine-level unitary salary structure, bringing increases in salary from 6.1 per cent to 19 per cent, the Enhanced Merit Promotion Scheme, and Performance Planning and Evaluation, which will replace the existing Performance Review and Development system. Below are some snippets, but for more information your best contact is INRE's Wendy Parsons on (06) 2766615.

Performance Planning and Evaluation (PPE)

Unlike the PRD scheme, PPE will be used to help determine merit and rewards — that is, incremental advancement, promotion, and incentive payments.

It will also be used as a trigger for inefficiency procedures.

The scheme will function as the first major step in reviewing the reward levels for staff each year, through the Staff Rewards Review — formerly the Staff Classification Review — process.

PPE should improve your chances to develop personal and professional skills and abilities. The new competency-based classification guidelines identify the required competencies in the various employment categories, so you should be able to identify a career path, and the competencies you need for it, more easily.

But by the same token it will be harder to progress *without* attaining these competencies.

On the whole, PPE is PRD with teeth, and it can bite upwards *and* downwards, so treat it with respect.

Enhanced Merit Promotion Scheme (EMPS)

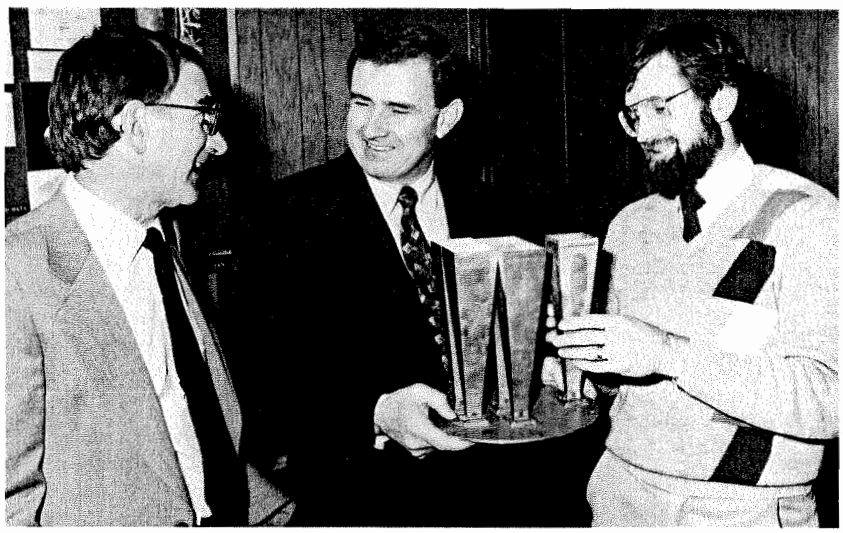
CSIRO has always had a merit promotion scheme, for some of its employees. EMPS extends it to all of them.

The new scheme will provide three reward options — merit promotion to a higher level, a cash incentive payment for outstanding achievement in the preceding year, and accelerated advancement (i.e. multiple incremental advancement) for staff who have sustained high performance over several years.

Under EMPS any or all of these rewards *may* be given, but no reward *need* be given: the old increments will no longer be automatic, as they are now tied to a satisfactory PPE.

Merit promotion may be approved where a person has a record of achievement that clearly demonstrates the competencies defined for that higher level. Promotion recognises the *level* of the work.

Caption competition



In June this year Simon Crean, Minister for Science and Technology, visited the Division of Radiophysics site at Marsfield, NSW. Left to right, Dr Dennis Cooper, Chief of Radiophysics, Mr Crean, and Dr Trevor Bird, Radiophysics, examine an array of feedhorns for the West Australian AUSSAT B beam. Well, that's what's really happening in the photograph, but it's crying out for a more imaginative caption! Whoever sends in the best one will, as usual, win a FREE MENTION in CoResearch.

Oh, don't be so retiring, now that you're retiring, Mr Charles!

This poem surfaced anonymously at the retirement dinner given for Mr Alan Charles, former Director of the Institute of Animal Production and Processing, at Sydney's Banjo Paterson Cottage Restaurant last month. I was expressly forbidden permission to reveal its authorship, and will only mention that the poet is no longer with the Institute.

Institutio Magnificum

In good Queen Bess's early years
When science ruled the roost, sir
If SIRO's bills were in arrears
They'd give our funds a boost, sir

On myxo, prickly pear and such
We built our reputation
When Oz's fortunes flagged a touch
'Twas SIRO brought salvation

And this is law, I will maintain
Until my dying day, sir
That whatsoe'er the boffins claim
Is gospel truth for aye, sir

But SIRO's fortunes ebb and flow
The dogs on science rounded
They said we'd lost get up and go
The SIRO ship had foundered

In Fraser's time we first were Lynched
They then applied the Birch, sir
Paul Keating our last penny pinched
And left us in the lurch, sir

McKinsey, PCEK, ASTEC too
Dissect and analyse us
Jones, Button, Crean, the DITAC crew
Naught else can still surprise us

The Board and Chairman come and go
Corp. Centre, Chief Exec., sir
They like to think they run the show
But don't have much effect, sir

But Institutes came to the fore
And saved the situation
*(Divisions thumb their nose at us)**
Divisions genuflect in awe
Bow down in adulation

And this is law, I will maintain
Until my dying day, sir
That whatsoe'er Director reign
The Institute holds sway, sir

Plans, strategies, goals, relevance
And added value too, sir
Without milestones you'll give offence
It's PRD for you, sir

Our logo, vision, bonuses
Inspire and stimulate us
But innovative science is
The measure of our status

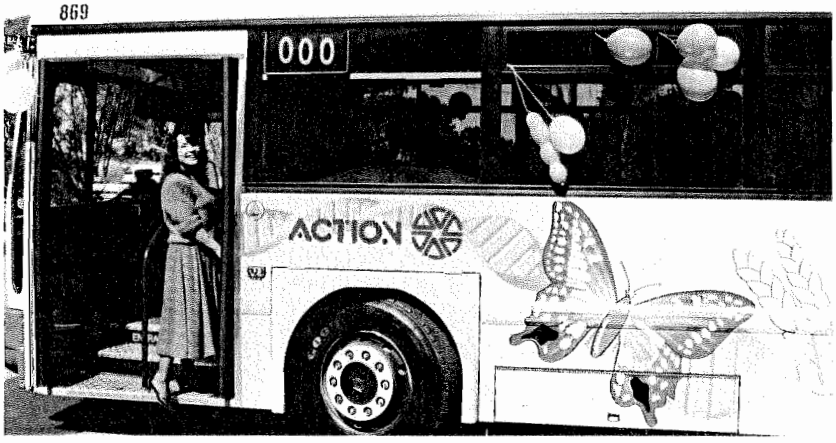
John, Anna, Lisa, Alans two
Selina, Keith, twice Nancy(e)
Sal, Denis, Derek, Sonya-true
A team to take your fancy

*(The Institute is over done)**
The Institute is over all
No snide remarks from you, sir
But lest our song begin to pall
We bid you all adieu, sir

And this is law, I will maintain
Until my dying day, sir
That whatsoe'er Director reign
The Institute holds sway, sir

**** Corrupt text — Divisional virus in computer***

CSIRO goes on the road



Above, Graphic Designer Pat Hardcastle and her value-added bus. The bus is one of ten that Canberra's bus service has allowed 'national institutions' to advertise on, and it will be carrying our message, as depicted by Ms Hardcastle, around the streets until the paint wears off. The design represents the different areas of research performed by CSIRO. One side shows research into primary industries and the environment, and the other side shows research in Australia's secondary and tertiary industries. The bus was officially launched — by bursting a balloon full of champagne over its bows — on the lawns in front of the Division of Entomology at Black Mountain in Canberra on 5 September.

Communicators get together

CSIRO's new push for better internal communication is really starting to get off the ground. The first meeting of the reconstituted Sydney Communicators' Group was held on 14 June, the Melbourne Communicators got together on 20 July, and the Sydney group met again on 22 August. Dr Stocker was guest speaker at the latter two, and stressed the importance of communication in CSIRO and his personal commitment to it.

Each of the meetings has brought together a mix of CSIRO communicators and outside experts.

At the first Sydney meeting IMEC's Chris Friday summarised the market research that led to the decision to replace *Industrial Research News* with a monthly 4-page section in *Business Review Weekly*.

Peter Quiddington of *The Sydney Morning Herald* spoke on 'science as news' and offered tips for getting stories into the papers.

At the Melbourne meeting Dr Stocker spoke of the importance of finding *good* news to push, Cathy Foley, a Research Scientist with the Division of Applied Physics, spoke on how to be both a bench scientist and a radio personality, and Richard Smith of the ABC's Quantum team gave advice on raising our television profile.

At the second Sydney meeting Patrick O'Neil, a journalist with the Division of Entomology, presented data from a UK conference on public perceptions of science, and Helen Meredith spoke about editorial preferences at *The Australian* newspaper.❖

Left to right, Mr Doug Howick, Division of Forestry and Forest Products, Dr John Stocker, Chief Executive, Dr Ron Sandland, Chief, Division of Mathematics and Statistics, and Mr Jeff Prentice, Manager, Communication, Division of Mathematics and Statistics. The photo was taken at the Melbourne Communicators' Seminar hosted by the Division of Mathematics and Statistics on 20 July.

***CoResearch* is produced by the Public Affairs Unit for CSIRO staff and interested outsiders. Readers are encouraged to contribute or offer suggestions for articles. Stories may be reproduced, provided acknowledgement is given to both *CoResearch* and CSIRO. The deadline for contributions is the 15th of each month, but earlier is better, as issues fill up fast. Editor: Liz MacKay, PO Box 225, Dickson ACT 2602. Phone: 06 276 6567. Fax: 06 276 6641.**

CoResearch

No. 336 November 1990 CSIRO's staff newspaper

CSIRO AUSTRALIA

Australian Industry — what have we done for them lately?

This year the judges of the Sir Ian McLennan Achievement for Industry Award were torn between two outstanding projects. They have decided on a joint Award, honouring both equally.

The 1990 Award recognises CSIRO's important contributions to advanced smelting and the solution of problems with the foundations of off-shore gas platforms.

The Minister for Industry, Technology and Commerce, Senator John Button, presented the Award at a lunch-time ceremony on 4 October at the ANZ Pavilion in Melbourne's Victorian Arts Centre.

The winning projects were SIROSMELT, represented by Dr Bill Denholm, Division of Mineral and Process Engineering, and a solution to problems with the foundations of off-shore gas platforms, developed by Dr Graham Price of the Division of Geomechanics. Each scientist receives $10,000 as part of the Award.

The joint Award highlights the strength of CSIRO's research collaboration with industry, especially in the minerals and energy sector. It also shows the sort of economic benefits Australia can expect from linking strategic research to the needs of industry. The estimated total contribution of the two award-winning projects comes to more than $160 million so far.

The SIROSMELT smelting process has placed Australia in the vanguard of a quiet revolution in the smelting of non-ferrous metals.

SIROSMELT works by plunging a 'submerged-combustion lance' into a liquid metallurgical bath. The CSIRO-patented lance was invented by Dr John Floyd, a former CSIRO scientist who is now the chairman and chief executive officer of Ausmelt Pty Ltd.

The process makes it possible to construct smaller and more efficient smelters, to turn 'sub-economic' ore bodies to profit, and to greatly improve the environmental performance of the whole smelting process.

CSIRO and its industry partners have invested more than ten years of collaborative research in the SIROSMELT process, and it's starting to pay off. Both of CSIRO's partners in the process — MIM Holdings Ltd and Ausmelt Pty Ltd — have recently announced major new applications of the technology both in Australia and overseas.

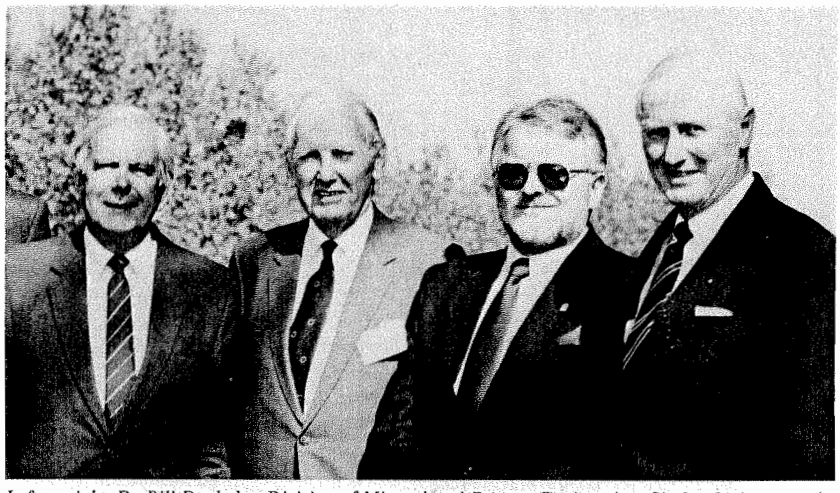
MIM markets the SIROSMELT process — using the name ISASMELT — under licence from CSIRO.

In October the company announced that it would convert its copper smelter to the ISASMELT process in a $135 million investment that could cut production costs by 25 per cent. The company is already installing the new system in its Mount Isa lead smelter as well as its British lead battery re-processing plant.

The work of Dr Graham Price, of the Division of Geomechanics, has made a unique contribution to the resolution of the foundation problems of the gas platforms in use on the North West Shelf of Australia.

In 1984 the first platform of Woodside Offshore Petroleum's North West Shelf development project was found to have serious deficiencies in its foundation. The cost of evacuating staff from the platform in the event of a cyclone, and the cost of increased insurance premiums, could have affected the long-term viability of the project.

Dr Price's internationally recognised knowledge of soil and rock properties was central to the solution of the platform's foundation problems. The value of his work to the North West Shelf Development Project has been estimated at $65 million.❖



Left to right, Dr Bill Denholm, Division of Mineral and Process Engineering, Sir Ian McLennan, the well-known industrialist after whom the Award was named, Dr Graham Price, Division of Geomechanics, and Sir Peter Derham, Chairman of the Award's Trustees. Photo by Tracey Nicholls, Division of Building, Construction and Engineering.

Stocker addresses the nation

On Wednesday 10 October Dr John Stocker delivered a nationally televised address at the National Press Club in Canberra.

He spoke in praise of the work of CSIRO, citing examples of the sort of return for investment it has always offered.

He then raised the matter of the 'fiery dispute' over Australia's forests, offering a possible 'way out of the impasse' via the newborn Young Eucalypts Program — a CSIRO project in collaboration with industry and the Tasmanian and Victorian Governments.

He released research results suggesting that a system of thinning native forests could help preserve them at the same time as boosting wood production by up to 60 per cent.

He also drew out the wild card of genetic engineering. 'We haven't had much of a debate about it in Australia,' he said, 'and it's about time we did. CSIRO will play a role in making sure genetic technology is properly understood, properly scrutinised, and properly carried out.' *(More on page 3.)*

Chief Executive John Stocker addresses an Australia-wide audience with his televised maiden speech to the National Press Club on 10 October. His central theme was — you guessed it — the benefits of science to society. Photo by John Houldsworth.

Now that we have their attention ...

Well. Project Ambassador is coming up like well conducted thunder.

I am really pleased with the response of CSIRO staff all over the country and have noticed a big increase already in the amount of public affairs activity.

And people outside are paying attention too. It's now widely known that we're putting more emphasis on our responsibility to communicate what we are, what we do, and why we do it.

A tremendous example of that was Biota 90, the recent open day for Canberra Divisions. There's a full-page feature on it in this issue, so I won't go into details, but the point I want to make is that there was a terrific response to the enthusiasm and impressive communication skills that were poured so generously into that display. You just had to be there and see the excitement of the people visiting it to get a feeling for its value.

Even on Sunday evening staff were still rushing out and grabbing passers-by to make sure that their particular display was not missed! Dr Max Day, who was on the CSIRO Executive a few years back, was there, and he was also impressed with the Biota display. He remarked that we as an organisation ought to be looking more at ways of measuring and assessing the impact of such efforts.

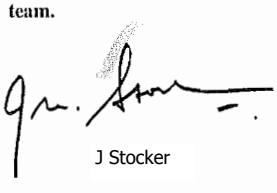
That seems a good idea given the time and effort that go into preparing for an open day. I'd appreciate suggestions as to how we might measure the benefits.

One aspect I noticed myself was that we're still a bit stuck in the old Definition by Division mould, with each Division putting on its own individual display.

In future I see advantages in bringing the work of *several* Divisions together in a common theme. This would let CSIRO be seen more as an organisation that applies its various skills to real issues in the community and less as one that lets a particular discipline generate and define the issues for it. In other words, we could show that we're driving these skills, they're not driving us.

I was talking about the idea of themes with Dr Max Whitten of Entomology and we came up with a few possible starters. These included forest management, rural tree decline, soil zoology and soil fertility, and perhaps an exhibit built around new techniques to reduce dependance on agricultural chemicals. Any show based on termites, trees, buildings or soils would be bound to find an audience, and an endangered species tent might have them queuing up for blocks.

Anyway, *well done*, Biota 90 team.



J Stocker

Letters to the Editor

Dear Editor,

Fertility Rituals

I welcome the letter in the last issue of *CoResearch* from my colleague DOM Isaac Instein, from the CSIRO Division of Applied Contemplation. At the CSIRO Division of Supernatural Agriculture we are pursuing research into fertility rituals.

Fertility rituals too depraved to be described in these delicate pages have been statistically tested in the field, with promising effects on crop yields. The treatments have included controls, mildly depraved rituals, and very depraved rituals. A paper describing the results will be published soon in the Journal of Supernatural Agriculture.

We are now working on a trial to determine the effect on the yield of wheat of sacrificing virgins to the gods. Unfortunately the virgins we had selected for the job discovered the object of the experiment, took drastic steps quickly, and were no longer virgins when the experiment was due to start. Typical of the lack of support for Australian research.

Crops grown with the help of fertility rituals are free of *fertilisers, pesticides and herbicides, and so command a premium price. They are more than organically grown, they are supernaturally grown.

David Erskine
Supernatural Agriculture
(next to Water Resources)
Griffith NSW

**Can this be right? —Ed.*

Dear Editor,

Imagine a professional football team (your choice of codes)where the coaching staff and managers were more highly regarded and better paid than the players. Further imagine that this football club devoted considerable resources towards training the coaches without worrying too much about training the players, since presumably they already knew how to play football. Since the coaches also already knew how to play football, imagine that the coaches' training program consisted of things such as abseiling and rope bridge crossing rather than football tactics.

It would be interesting to speculate how motivated the star players would be to continue playing their best football out on the field. It would be more interesting to examine the win–loss record of such a club.

But of course it would be silly to imagine such a situtation, since most professional football clubs are far too intelligent to organise resources in such a way.

Art Raiche
Exploration Geoscience

Dear Editor,

I am grateful to you for the opportunity to see Art Raiche's letter and to submit a somewhat different view.

Imagine another football team which is coached and managed by people who were outstandingly brilliant, individual stars during their playing days but, somehow, each has developed a slightly different understanding of the objectives and rules of the game and each has a totally different set of tactics. To complicate matters, they seem unwilling or unable to communicate with one another about their different perspectives. Even worse, some are unable to restrain themselves from running on to the ground and grabbing the ball at critical points in the game.

For such a group of managers and coaches, a training program which included abseiling and rope bridge crossing to help individuals understand how to develop, communicate and achieve team objectives might be quite useful.

But again, it would be silly to imagine such a situation. No football club would appoint its star players to management or coaching positions without first considering their suitability for these quite different roles and without first putting them through a comprehensive and imaginative training program to help them make the transition.

Bob Marshall
Employee Development Unit

Dear Editor,

Professional communicators say that most often, it is not the message that is sent but the message that is received that matters. In that case, it becomes easier to understand why the public image of science in general and CSIRO in particular has not been good as scientists have not seen the need for effective public communication. I believe that this is the reason why the Organisation has been subject to political criticism and why successive governments have given us a low priority. Readers with long memories may recall that I contributed an article on the need for effective lobbying on this subject to CoResearch. I have not changed my opinion that both the Organisation and individual scientists need to become more productive in communicating with their stakeholders — the general public, politicians, industry etc. In fact, Barry Jones' only lasting legacy as Minister of Science may well be his success in persuading scientists to stop behaving like wimps.

I am glad to see that (at long, long last) CSIRO is beginning to treat seriously the business of communication, and the recent release of the mission statement to all staff is a step in the right direction. However, I think that it is a little impersonal and that we need something shorter and snappier to describe our research activities. Overseas it is common practice for successful business to have company slogans so I suggest that each Division or Unit should have a brief slogan or phrase to describe its aims. Perhaps we could even have a competition (sponsored by the Board) for CSIRO staff to come up with the appropriate 'mission statements'?

David L. Topping
Division of Human Nutrition

Dear Editor,

I am still having trouble coming to terms with the implications of the McKinsey/PCEK Review, which discontinued CSIRO's translation service. Recently I came across the abstract of a Russian paper that seems directly relevant to my research program. Within two weeks I had a copy of it on my desk, and asked our librarian to have it translated, remembering the hard-working CSIRO translators in the back room of the National Measurement Laboratory. No luck, the translation service has been disbanded! It seems that I must send the paper to a consultant translator, at commercial rates, charged to my project.

The quote for translation comes to $260. This would be 1/12th of my group's annual Appropriation funding! Logically, we simply can't afford translations. But can CSIRO really claim to be a world-class scientific body if we don't keep informed of research published in other languages? And, in purely practical terms, it seems false economy to ignore papers written in languages other than English, and risk repeating work already published elsewhere.

Please, Corporate Centre, give us back our translation service!

Alister K. Sharp
Food Research Laboratory

Field trials of new bacterium begin

CSIRO is testing its first genetically modified bacterium. Trials of the altered bacterium are already under way at Roseworthy Agricultural College in South Australia, following recent approval to proceed from the Genetic Manipulation Advisory Committee

Dr Maarten Ryder of the Division of Soils is conducting field tests of a genetically altered bio-control organism to be used to control Take-all, a troublesome disease attacking wheat crops.

The original Pseudomonas bacterium — of the wheat disease 'Take-all' — has been genetically 'tagged' to distinguish it from other similar soil micro-organisms, allowing its path to be tracked in the soil.

This tracking will help scientists gauge the life-span and numbers of the organisms as well as the site near the roots where they work best.

Biological control of Take-all offers an alternative solution to this serious problem for wheat growers across southern Australia and other parts of the world. The Take-all fungus can decrease yields by more than 50 per cent by growing on the roots, blocking them and making them less effective. The biological control bacterium prevents the fungus from infecting the roots by producing antibiotics that stop fungal growth.

The 'tracking' technique, developed by specialists from Monsanto Company and tested extensively in the USA, uses genetic engineering as a tool for tracking the biological control agent.❖

continued from page 1

Stocker addresses the nation

Dr Stocker made a special point of drawing attention to CSIRO's failures in his address to the National Press Club on 10 October.

A cost–benefit analysis done by external consultants in 1988, he said, had shown that in spite of some projects failing to perform at all over the five-year period under study, the overall benefit-to-cost ratio came out at more than two and a half to one. 'I can think of a few entrepreneurs,' he said, 'who would love to be able to boast that sort of return.'

Dr Stocker said the study showed CSIRO's research into ways of cheaply extracting oil from shale to be a total failure, as it had returned almost no quantifiable benefits over the five years.

'But,' he said, 'I can assure you that's changed pretty abruptly in recent weeks. And with the continuing excitement over what world oil prices will do, this technology we've developed is now very much a hot centre of focus for a lot of industrial attention.

'CSIRO has always more than paid its way, and in the present economic climate the Australian economy needs us more than ever before. Clever companies — and I'd like to suggest even clever countries — need to invest in research and development *exactly* at those times when the going is tough. *That* kind of investment has to be *anti*-cyclical, because it's going to lead to results that will provide some of the tools to help overcome economic difficulties.

'In this and many ways I see CSIRO as a bulwark between the 'clever country' championed by the Prime Minister and the 'banana republic' Paul Keating warned us against.'

...

If Dr Stocker's address at the National Press Club has been his most high-profile public relations exercise in the seven months he has been with CSIRO, it is far from being his only one.

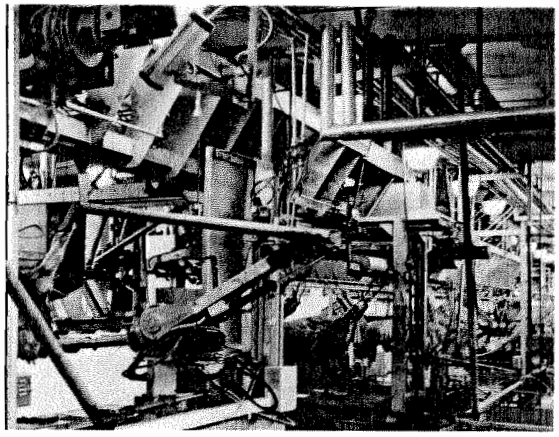
His own individual 'Project Ambassador' effort so far has included feature articles in *Search, New Scientist, The Bulletin*, and *Business Review Weekly*. On top of that he has found time for —

27 radio interviews (not counting 'snippets');
7 television features;
21 launches (where he was the major speaker);
14 major newspaper feature interviews;
10 formal receptions of overseas dignitaries;
25 formal calls on Parliamentarians and Parliamentary groups (not counting his regular meetings with Simon Crean);
32 on important bureaucrats;
46 on private companies;
13 on academic institutions; and
9 press releases (not counting Divisional ones).

But just in case you're starting to think he must have been neglecting the home front, he has also managed in the same period to visit 70 CSIRO sites and units.

They can say what they like about John Stocker; he certainly is peripatetic.❖

Fututech moves in for the kill



***Fututech** — the semi-automated slaughtering equipment developed by CSIRO's Meat Research Laboratory — has found a home. A Melbourne-based engineering group with international experience in meat processing — FMC (Aust) Ltd — has won the licence to manufacture and market the technology.*

The agreement was signed in Sydney on 18 October. The signatories were the Australian Meat and Live-stock Research and Development Corporation, the Institute of Animal Production and Processing, and FMC. FMC is a subsidiary of a US company, with complete Australian autonomy, but with American technical back-up on call.

IRN goes pop

Don't miss the first edition of CSIRO's newest publication — *CSIRO Business*.

It came onto the stands on 25 October as a fully bound-in section of the very glossy, very popular and above all, very influential, magazine, *Business Review Weekly*.

CSIRO Business replaces *Industrial Research News* as CSIRO's main organ of industry-related research news, and is expected to reach a much larger audience. The editor is still Dr Brian Harding.

Launching the new enterprise, Chief Executive Dr John Stocker said the publication would help CSIRO strengthen its links with Australian business.

Robert Gottliebsen, Managing Director of *Business Review Weekly*, said that science, and particularly applied science, would become increasingly important to the development of business during the 1990s.

This first issue of *CSIRO Business'* focuses on environmental management technologies, and should interest a wide general readership. As an added incentive toll-free telephone and fax lines have been set up to make it tempting for curious readers to find out more about our work.

An appeal to CoResearch readers

I'm trying to build up a file of original cartoons and illustrations for use in *CoResearch*. I often find I want one to illustrate a story, lighten a dreary page, or just fill an awkward gap. I hate the idea of swiping them from other papers, when CSIRO must be full of unrecognised talent. So make yourself famous and an over-worked and under-resourced old editor happy — draw today!

The Crean Machine

The Crean Machine

– can it take us where we want to go?

Traditionally CSIRO has been called in to provide the intellectual muscle power after the people in charge of the country have decided what sort of science needs to be done. Under Simon Crean we now have Ministerial blessing for taking part in policy decisions, and, more importantly perhaps, some machinery that will allow us to do so. But could it be that we have a bit to learn when it comes to maintaining and driving our shiny new policy machine? Mr Crean addresses that and other points of interest to staff in this CoResearch exclusive.

Developing the role of science in Australia — sustainably

People overseas think of Australia as a country of huge but under-developed resources, and that's about right. But the resources are not all buried in the dirt or trotting about on the hoof: one of our most under-developed resources is our capacity for scientific discovery. We have always been a clever country in terms of our scientific and technological inventiveness, but when it comes to the application of those assets, well, we haven't been so clever.

I also believe firmly that the country that hasn't got a strong science and technical base is a country that hasn't got the potential to be innovative, and innovation is crucial to strength and competitiveness. So from the point of view of solving our economic problems I see science and technology having a vital role to play. But we can only do that effectively if we begin to get better linkages between the science and technology field and industry. And government too — the whole thing has to be linked up — but the major connections will have to be with industry.

Funding from external sources has helped: there is now much more co-operation with industry at all levels within CSIRO. And that's a good thing.

The other reason these connections are vital is that they make it possible for us to make a real contribution to the sustainable development debate. They make us more aware of the consequences of particular resource developments, of their impact on the environment. That means we're able to apply our skills to come up with solutions to environmental problems.

In fact, it's basically for that reason that we now have CSIRO represented on each of the sustainable development committees. That means we're in there at the birth of policy, not just called in later as a technical resource, which has tended to be the way science has been used.

Till now, we haven't had a process for distilling out the areas of contention and reconciling the differences. That's what the sustainable development process — through the sustainable development committees — will supply. That's the process CSIRO is now specifically and directly involved in.

Freedom to speak — one at a time

If any scientist has a constructive contribution to the debate, I welcome it. I don't basically have a problem with that.

The recent southeast forest debate, I think, was a good example of a case where it makes a lot of sense to use the sustainable development committee process for the longer term resolution of the problems. But we had a particular problem in terms of a previous political commitment, and that had to be honoured.

I do welcome any contructive comment, and I do recognise that in an organisation your size there's not going to be just one view shared by all scientists. But CSIRO needs a mechanism by which it can present a single CSIRO view. If it is positioning itself to play the wider role — to get its points across and then to provide the research base and the scientific and technological knowhow — then it needs to be able to inject into the debate a coherent CSIRO view.

I have talked with the Chief Executive, and I think we've worked out a means by which scientists can still contribute to the debate in the way they have before and yet play more of a role in the sustainable development process. Not just making a technical contribution to a particular problem, but being in on the policy development phase.

Now that's something CSIRO hasn't had before. You have it now, and you have to assess it, and no longer just from the perspective of what one particular scientist may think. It's a new power, but you're going to have to develop the mechanism that will make it work.

In the final analysis it's the consultative process — and the report that goes to the government out of it — that is going to determine how we as a nation respond to the sustainable development challenge. Well, CSIRO can now have a voice in that report, but it will have to be a clear, intelligible, persuasive voice, not a confused clamour of dissent.

The new award structure — finding the balance between new rights and the New Right

If you run wages simply on the basis of equity, you get a skill drain. But if you run them on the basis of rewards for skill and market forces, you lose equity.

So you've got to find the balance between the equity and the efficiency. That is the wage framework that was being developed in the ACTU during the time I was there, and will continue to be developed now that I'm gone.

I don't have a hang-up about different increments being paid to different people, as long as the increment recognises the skill level and the training that is being undertaken. If the wage increase rewards the training and the skill formation process, then I think that's a sensible direction for wages policy to head in.

Of course it can't be done totally at the expense of equity considerations, but this wages structure doesn't do that. There is an equity base in it, but there are additional amounts that reflect skill. Particularly scientific skill, because that's the main purpose of your business.

CSIRO funding — making the right comparisons

It has been said that CSIRO funding has been reduced. Well, there are two things I want to say about that.

First, government commitment to science and innovation in this budget was up 2.3 per cent in real terms, whereas overall outlays were down by 0.6 per cent. Over the period during which this government has been in power — from '83 — science and innovation spending has gone up 23 per cent in real

terms with general outlays only 10 per cent.

I think that does indicate the commitment of this government to ensuring that it is placing a priority on promoting science and research. We are building the asset.

Second, a lot of people think you can judge the commitment of this country to science and research just by looking at the appropriation line for CSIRO.

That's a distortion, because the total picture is not just CSIRO. What we've got to compare is eggs with eggs: we've got to compare total funding here with total funding in other countries.

Research funding doesn't come — and no other country expects it to come — from government alone. We've got to get a better commitment from the private sector, and that's what the 30 per cent is about in CSIRO.

All of that 30 per cent is retained now, and it has to be added to the government's commitment, in real terms. We need to see the significance of an increased ability to attract funding through the 150 per cent tax incentive scheme, and the various industry development schemes. And now there will be increased opportunity to take part in the Co-operative Research Centre programs.

So I think your readers need to look at the broader picture, not just the government line appropriation to CSIRO.

Getting plugged into industry — and talking them into switching on the power

We're doing the best we can, and there are a number of means at our disposal. The Co-operative Research Centres Program is one; the taxation and grant incentives are others.

But I think what we've really got to do is demonstrate the relevance of science and research to the mainstream issues. Those issues are the economic competitiveness debate — the balance of payments — and the environmental solutions — how we balance the need for resource development with the need for environmental protection. We've got to show that science plays a necessary role in those solutions.

If we can demonstrate relevance then business will see that it's going to be in their interest to utilise science and technology more effectively.

Now while the contribution that the business sector has made to research and development is low by international standards, we have seen a marked shift in that area. Private sector research has nearly doubled in the time we've been in office. It went up 16 per cent in 1988–89, when I would have thought the general tendency in most companies was to cut back.

So maybe companies are starting to see research and development as an investment rather than a cost, at last.

Project Ambassador — a case of what you know, and who knows you know it

I think it's very important to promote the achievements of CSIRO. And it's equally important to promote the potential achievements. I think that part of this problem of 'under-realising the asset' is that there just isn't enough broad awareness out there as to either what CSIRO has done or what it is capable of doing — where the stock of its knowledge is at.

So of course I welcome and endorse any initiative that is designed to promote that.

Way to go, CSIRO!

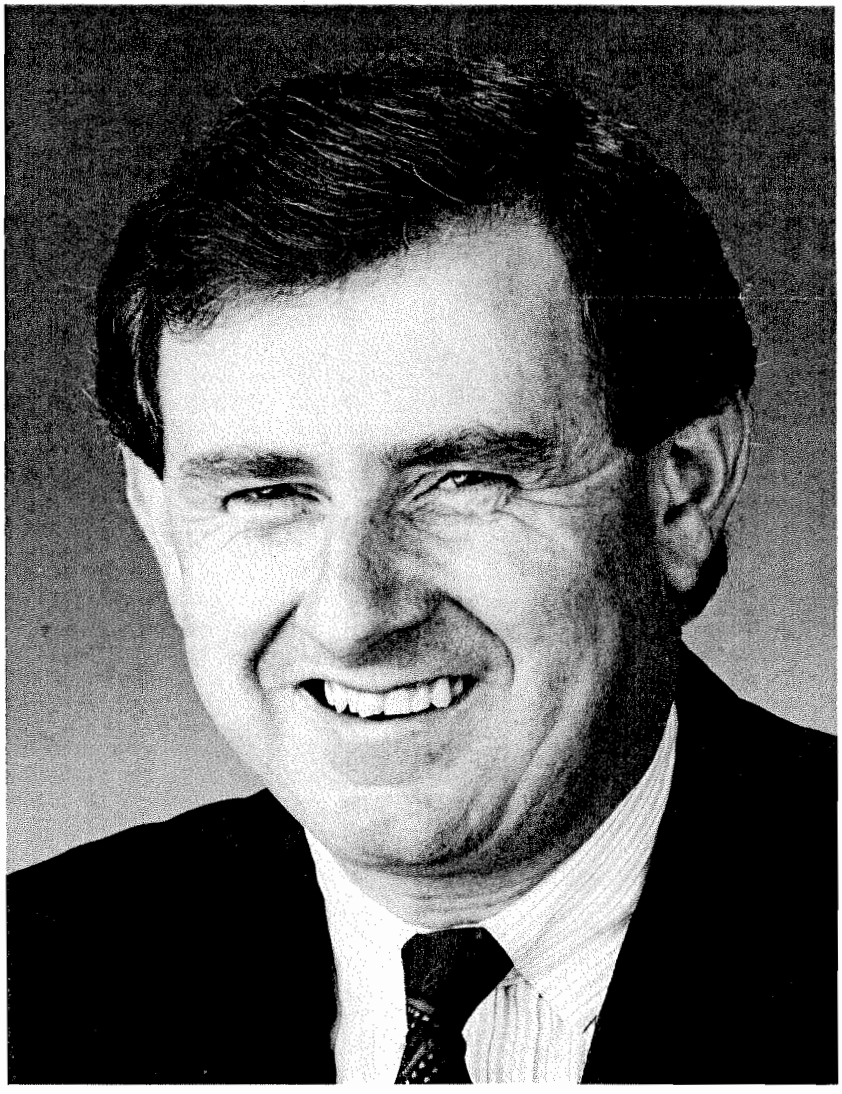
Since I've had this portfolio I've met a lot of people and visited a number of the institutions and Divisions associated with CSIRO. I've had a number of meetings with the Board and regular meetings with the Chief Executive. Depending on the project areas, I've had frequent meetings with Chiefs.

I've had a number of discussions on the telecommunications debate, the forest debate, and the sustainable development issue.

So in spite of the shortness of time I've been in office I've had, I think, a detailed and wide exposure to the work of CSIRO. And I'm impressed.

What impresses me is not only the quality of the work being done and the commitment of the people doing it, but the direction CSIRO is now heading in. I think it is complementing in a vital way the government's strategy for science, and of course I see that as the only way to go.

If we succeed together then I think we will see a much wider relevance for science and technology in this community, which means a much bigger role for CSIRO, and a much wider range of career paths to attract people into the area of science. Businesses are going to have to start paying top money to top scientists. Then we'll really start to see the career paths open up.❖



'CSIRO now has a chance to make policy. ... It's a new power, but you're going to have to develop the mechanism that will make it work. ... In the final analysis it's the consultative process — and the report that goes to government out of it — that is going to determine how we as a nation respond to the sustainable development challenge.'

A Matter of Opinion

This month's opinion — on the supply of private-plated cars to senior CSIRO officers — comes from Dr Alister Sharp of the Division of Food Processing.

The Scheme

According to the policy document 'Attachment B, Conditions Governing Provision of cars to Senior Staff' (undated and unattributed), 'CSIRO officers classified as Senior Executive and Research Leaders classified as Senior Principal Research Scientist and Chief Research Scientist with significant management functions' are to be provided with privately registered cars.

CSIRO pays for registration, comprehensive insurance, automobile association membership, and servicing, and provides petrol. The car may be driven by other members of the family. At work the car need only be made available for use by other CSIRO staff if required by local management.

The standard car is either a Mitsubishi Magna Executive, Holden Commodore Executive or Ford Falcon GL sedan or station wagon, fitted with power steering, automatic transmission, airconditioning, fuel injection. and certain accessories. Alternatively, the officer may choose any cheaper car manufactured in Australia. The officer contributes $700 p.a. (for a six-cylinder car) or $500 p.a. (for a 4-cylinder car).

The initial cost to CSIRO of providing new cars is stated to be $1,350,000 in 1990/91 and $800,000 in 1991/92. Recurrent costs are not estimated.

Essentially, the provision of a car with all expenses paid is equivalent to a before-tax pay rise of perhaps $15,000 p.a. Unlike other recent salary increases, however, this pay rise applies only to selected senior officers, and has bypassed the procedures of the Industrial Relations Commission.

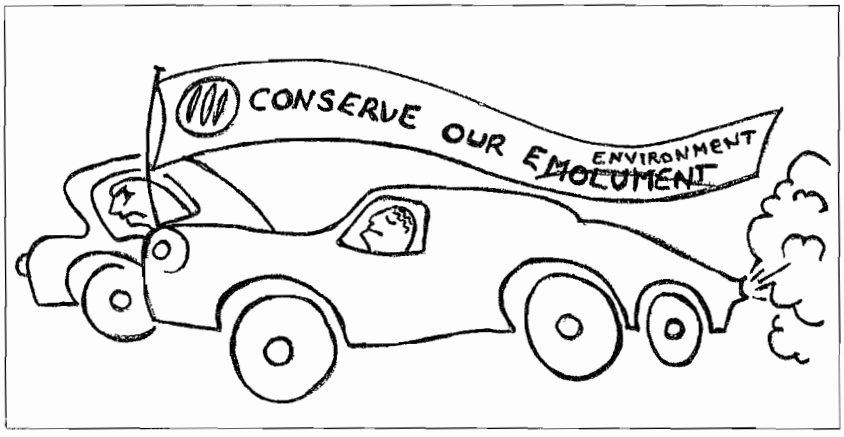
Shortcomings of the Scheme

1. The scheme is inequitable, even to those officers receiving cars, because its value depends on the officer's needs for a car. To someone who lives close to work, or uses some other form of transport which costs less than $700 (e.g. walking), a car could actually leave the officer worse off!
2. Although in effect a salary rise, the scheme is not funded as salary, with Treasury compensation for increase. It competes directly with research expenditure.
3. By providing cars for private use, the Government encourages single-person commuting rather than the use of public transport, car sharing, walking or cycling. Thus, at a time of attempting to reduce public sector spending, the Government is creating a need for more expenditure on roads!
4. Part of our Government's motor vehicle policy is to improve their fuel-consumption, yet the standard vehicles specified under the CSIRO car scheme are fuel-inefficient 'gas-guzzlers'. Surely the CSIRO car policy is sending a message to Australian car manufacturers that, contrary to the stated policy, the Government wishes them to continue to produce gas-guzzlers.
5. Under the Montreal protocol, Australia is bound to reduce the emission of all ozone-depleting substances, including the refrigerant CFC 12. Automotive air conditioning accounts for 60 per cent of CFC 12 consumption world-wide, which is large compared to the 4 per cent consumed in producing domestic refrigerators. Yet the Government is directly increasing the release of CFC 12 by specifying cars that require air conditioning to be comfortable in the Australian climate!

Recommendations

1. Private-plated cars should be funded as salary, distinct from research expenditure.
2. All officers eligible for privately plated cars should be able to choose instead to take the equivalent value in cash.
3. The types of car supplied should be appropriate to the local conditions, and consistent with the Government's policies on fuel consumption and atmospheric pollution. Government purchases should be used to encourage the Australian car industry to produce vehicles that are thermally efficient and fuel-efficient.

❖❖❖



A bargain for speakers of fluent computer

The Division of Mathematics and Statistics (DMS) has arranged new low prices for CSIRO users of the S-PLUS software.

S-PLUS is an interactive software system for data analysis, graphics, and statistics. It comes from Statistical Sciences in Seattle, and is an implementation of the S Language from Bell Laboratories.

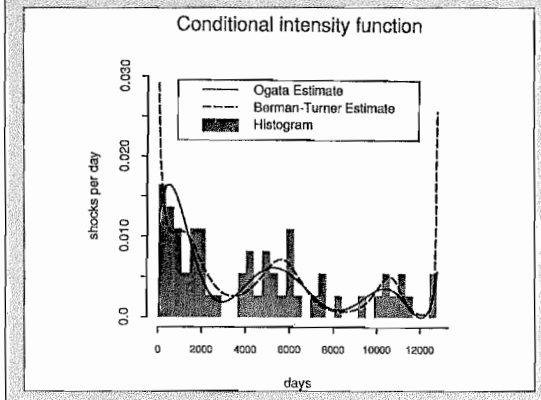
The graphics facilities include scatterplots, lineplots, barcharts, piecharts, contour plots and perspective plots. The user can specify many details of the plots, or else accept default settings. Laser printers or plotters provide publication-quality hard copy.

The Division is developing additional modules for S-PLUS, and distributes the software within Australia. We have found that researchers are demanding and innovative users of the software, and the feedback from these users is a positive stimulus to the software development. So we expect that increased use of the software in CSIRO encouraged by the reduced prices will assist their work.

An example: the cost of a single user licence on a Sun SPARCstation or DECstation 3100 is being reduced from $2,800 to $1,400, and the introductory price of the DOS version is reduced from $1,495 to $1,195.

For further information contact Sue Clancy on (02) 413 7549, or electronic mail to clance@syd.dms.csiro.au.

The Figure shows an example of publication-quality graphics.



Conferences and Seminars

8 November Quality Control in the Materials and Manufacturing Industry: Le Chateau Convention Centre, 48 Queens Road, Melbourne, Vic., 3004: $120: contact IMMA, PO Box 19, Parkville, Vic., 3052.

13 November Occupational Health and Safety in the Materials and Manufacturing Industries: Town House Hotel, 701 Swanston Street, Melbourne, Vic., 3053: $120: contact as above.

13-14 November Science and Technology Creating Wealth for Australia (NSTAG 90 Forum): Becker Building, Australian Academy of Science, Canberra: $300: contact Conference Manager, IEAust., 11 National Circuit, Barton, ACT, 2600, tel 06 270 6562, fax 06 270 6530.

3-6 December Third Australian Supercomputer Conference: University of Melbourne: $250: contact Conference Organiser, Strategic Research Foundation, 191 Drummond Street, Carlton, Vic., 3053, tel 03 663 3077, fax 03 663 3348.

Biota 90

...an unscientific experiment

Karen McGhee, a journalist with the Division of Plant Industry, was one of the organisers of Biota 90, a sort of 'science celebration' held at Canberra's Black Mountain site on the weekend of October 13 and 14. Here she offers CoResearch readers her impressions.

If you ever doubted the level of community interest in science or CSIRO's ability to communicate with the masses, the success of Biota 90 should have set your mind at rest.

Biota 90 was 'a communications experiment' staged over a recent weekend by CSIRO's Canberra-based laboratories in conjunction with the Australian National Botanic Gardens (ANBG). Dubbed a 'natural science and environment festival', it was run as a high-profile trial replacement for relatively low-key open days held separately by the two organisations in past years.

There was no doubt that previous open days in Canberra (particularly those at the Division of Entomology which had attracted up to 6,000) were worth running. But was it possible to generate more interest in such events? If the sort of television, radio and newspaper promotions organised for Biota couldn't attract better media coverage and draw in bigger crowds then nothing would.

And, with a little help from some of the best spring weather Canberra has to offer and an enormous amount of time and effort (much of which was voluntary) from CSIRO and ANBG staff, the experiment worked ... better, in fact, than anyone had predicted!

Conservative estimates based on car counts put the number of people who visited the festival at more than 30,000. While that may not seem large when compared to the crowds attracted to CSIRO open days in Sydney, it was impressive considering Canberra's total population. However, the sheer number of people attracted to the event was not the most rewarding aspect of the festival's success. Positive feedback, both from the public and from within CSIRO and the ANBG, has been inspiring. The following letter was typical of the response:

' ... I'm just writing to thank all involved in presenting so many interesting exhibits and hands-on activities to the public in the Biota festival. Having attended on both days, it seemed as though thousands of people were swarming over the two venues. Congratulations on showing so much to so many people! It was rewarding to see so many scientific personnel explaining aspects of their knowledge to visitors and, at all times, welcoming all kinds of queries with calmness, humour and enthusiasm. A special thank you, too, to those with less 'exotic' roles — the parking marshals and mini-bus drivers. I do hope Biota will be repeated. It was a triumph for Australia's scientific community!'

Another letter finished with: 'PS. Any effort the public can make to ensure the CSIRO funding is continued I wish to participate in as I think your work is invaluable to Australia.'

In a typical phone-call, one woman spoke about how her children, aged five, six and eight, had enthused over what they'd seen at Biota 90 and taken their Biota passports to school to show teachers and friends. (A free passport system for kids was used to help guide people around displays at the site. There were different stamps to collect from 13 locations.) She said she thought her kids had learned more from a day at Biota than if they'd spent a month in the library.

So, should there be another Biota? Should it take the same form? And is the expense worth it?

The feeling among the seven CSIRO Divisions that took part in Biota and ANBG is that the festival should be held again, every second year. Exactly what form it takes next time or whether it will emerge as the cornerstone of some sort of 'National Science Spectacular' in Canberra needs to be looked at closely. Biota was not a cheap exercise.

For CSIRO, the direct cost, shared between the Corporate Centre and the relevant Divisions, was in excess of $100,000. That does not take into account the salaries of organisers or the massive amount of voluntary labour over the weekend of the festival.

On simply a cost per visitor basis it would be hard to justify the expense. However, 'bums on seats' can not be seen as the only justification for this sort of exercise. (It is worth noting here that the Black Mountain site could not cope with bigger crowds over a weekend and extending the festival would eat excessively into research time.)

In terms of team-building within and between CSIRO Divisions and the experience in communication that it gave scientific staff, the festival would seem to have been invaluable. In addition, many of the displays prepared for the festival will carry through for future Ministerial, industry and public visits to individual Divisions.

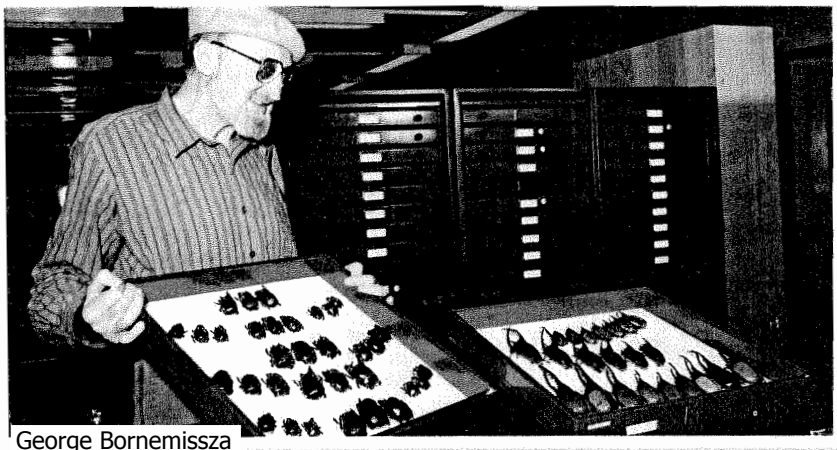
It is also worth acknowledging that the 30,000 who visited Biota were part of a very influential population that includes bureaucrats and politicians who play a major role in decisions on CSIRO funding. Certainly Mrs Ros Kelly, Minister for the Environment, who was given an official preview of the festival, was impressed by what she saw at Biota.

Perhaps the most important facet of an event such as Biota is the opportunity it provides for imparting a more lasting impression than other avenues of communication. For example, a visitor to a museum or science centre will spend 20 minutes at any particular exhibit. In contrast, visitors to Biota spent hours surrounded by the CSIRO message.

And, above all, by providing access to scientific staff it can show the human face of CSIRO in a way that no brochure, newspaper or magazine article, book, television documentary or museum display can.❖

Above, visitors admire Annemieke Mein's environmental textile sculptures, one of the most popular displays at the Biota 90 open days in Canberra. (Photo by John Green of the Division of Entomology.) Annemieke is a professional textile sculptor, devoting herself professionally to full-time work with fibre. The result is an intricate graphic and textural portrayal of Australian flora and fauna. On display in the Division of Entomology's lecture theatre were a variety of her works, featuring insects and birds as a theme. The flora and fauna featured are depicted many times their actual size, encouraging people to have a closer look at nature.

Annemieke Mein's work is unique, and has gained her international recognition. It has heightened public awareness of Australia's natural heritage. The work Annemieke does in the creation of her sculptures highlights the link between science and art. Her workshop shelves abound with insect specimens for use as a reference source, and her bookshelves bulge with reference books on Australia's fauna and flora.



George Bornemissza

Above, Dr George Bornemissza displays some of his several thousands of beetles, collected from all over the world since his retirement. Dr Bornemissza returned from Tasmania to the Division of Entomology in Canberra to explain his collection to the visitors to Biota 90. He has donated the collection, assembled at his own expense, to the Division's Australian National Insect Collection.

It has taken Dr Bornemissza more than seven years to classify and mount the specimens in the display. He said he would never have undertaken the task if he had realised just how complex and demanding it would be. It was his intention from the start to donate the collection to the ANIC. 'It cannot serve its purpose in my possession,' he said. 'I designed it to let as many people as possible enjoy the beetles as I have enjoyed them in my life. I'm just passing on this pleasure to future generations. I've always felt that this tremendously impressive and most versatile group should be brought forward to the public in general and the oncoming generation in particular.'

The photo is by John Green of the Division of Entomology.

An image boost from CSIRO's image makers

CSIRO staff featured prominently at the Second International Conference of the Australian Institute of Medical and Biological Illustration (AIMBI) held recently at the University of Melbourne.

Geoff Lane, from the CSIRO Minerals Research Laboratories in Sydney, won first place in the 'General Illustration — Photography' category, in the professional exhibition, as well as the Institute's National Award for the most outstanding entry.

During the course of the conference Mr Lane's colleagues nominated him as National Chairman of the CSIRO Photographers' Group.

In a speech thanking organisers of the conference Mr Lane expressed great concern at the recent loss of CSIRO positions in photography and allied areas at a time when the Organisation was desperately trying to elevate its profile. He said that many of these people had expertise not only in illustration but in the application of photographic and other imaging technologies to research projects.

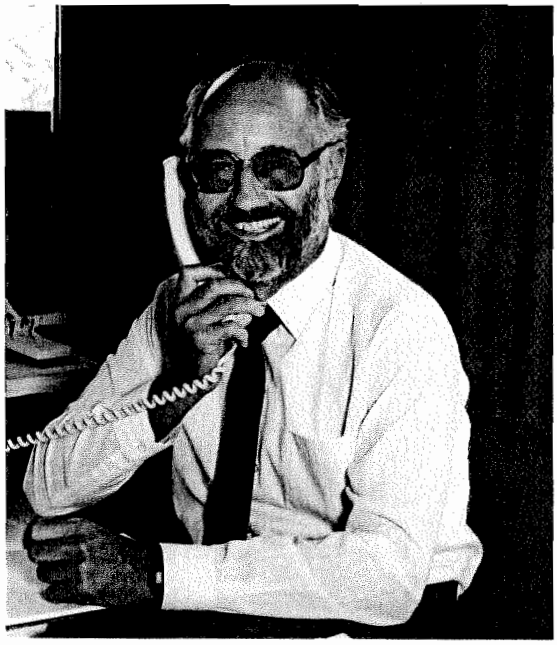
Mr Lane also stressed the importance of keeping up the relationship between AIMBI and CSIRO'S 'image-makers'. The association had great value, he said, not only for the medical and biological fields but for the broader scientific community as well.

Hania Roe, of the Division of Wool Technology's graphics unit in Sydney, gave a half-hour presentation on her work with 'Mirage' computer graphics software. She demonstrated a pioneering excellence in two years of development in the use of this sophisticated program. Ms Roe also exhibited some fine work in the professional exhibition.

Louise Lockley, from the Division of Biomolecular Engineering, gave an excellent talk on photographic aspects of 'small diameter vascular graft development' involving use of the Laser Confocal Microscope — an exciting development in microscopic examination.❖

CSIRO photographers Louise Lockley and Geoff Lane discuss some images used at the Second International and Ninth Biennial Conference of the Australian Institute of Medical and Biological Illustration held recently at the University of Melbourne. Photo by Chris Taylor, North Ryde Site Services.

More accolades for Sirospun



Above, a smiling Dieter Plate learns of yet another award his Sirospun spinning system has collected.

This time it's the highly regarded Warner Memorial Medal, awarded to Dr Plate as head of the team responsible for the outstanding success of the system, developed at the Division of Wool Technology.

Competition for this medal is world-wide, and it complements the Sir Ian McLennan Achievement for Industry Award won by Dr Plate in 1988.

Dr Plate is Assistant Chief, Division of Wool Technology, and Officer in Charge of the Division's Geelong Laboratory.

Sirospun, a method developed to both spin and twist yarn in the same operation, has already collected about $6 million in licencing fees and royalties from approximately 250,000 spindles around the world. The system saves the industry an estimated $40 million annually and has the added advantage of spinning a smoother yarn.

International honour for Peter Somlo

Dr Peter Somlo, Senior Principal Research Scientist at the Division of Applied Physics, has been elected as Vice Chairman of Commission A of the International Union of Radio Science (URSI). The election took place, in his absence, at URSI's recent triennial General Assembly meeting in Prague

Commission A deals with electromagnetic metrology, or the art of precision measurement. Vice Chairmanship of the Commission, which is for a period of three years, is normally followed by Chairmanship.

'I have attended only every third General Assembly,' said Dr Somlo, 'so I believe this nomination was not for 'high-profile committee work' but for scientific achievement, for which opportunity I wish to thank CSIRO.'

***CoResearch* is produced by the Public Affairs Unit for CSIRO staff and interested outsiders. Readers are encouraged to contribute or offer suggestions for articles. Stories may be reproduced, provided acknowledgement is given to both *CoResearch* and CSIRO. The deadline for contributions is the 15th of each month, but earlier is better, as issues fill up fast. Editor: Liz MacKay, PO Box 225, Dickson ACT 2602. Phone: 06 276 6567. Fax: 06 276 6641.**

File Com : CSIRO

CoResearch

No. 337 December 1990 CSIRO's staff newspaper

CSIRO AUSTRALIA

DSIR disbanded

1926 was a historic year for science administration: the southern hemisphere gave birth to a prodigious pair of twins. New Zealand's newborn public-sector science body was christened DSIR, and ours here in Australia was CSIR, later to become the CSIRO. But now our venerable sixty-four year-old sister organisation is to be replaced by a number of separate institutes. The process will be spread over eighteen months, with details still to be worked out; but the decision itself is not open to review.

Announcing the change on 28 November, Minister of Research, Science and Technology Simon Upton said DSIR was 'no longer an appropriate agency given the way we now fund science.'

Other New Zealand Government science agencies such as the research arm of the Ministry of Agriculture and Fisheries would also be restructured into what he called 'Crown Research Institutes'.

DSIR Headquarters would no longer be required once the split had been completed by mid-1992.

Upton hoped for minimal disruption to working scientists, expecting the greatest impact to be more for those who manage and administer, although he did not expect redundancies.

'As I see it, it really will prove to be a pretty popular policy announcement out at a divisional level, and there's a lot of excitement and interest,' he said.

'It's scientists I'm principally concerned for in this reform. It's not a reform for the sake of reform.'

The DSIR and other government research agencies as they existed at present were the result of historical accident, he said.

'There's nothing particularly rational about those organisations.'

The last New Zealand Labour Government in some ways set the course for the restructuring the new National Government was now pursuing, he said.

A Ministry of Research, Science and Technology was recently created by the last Labour Government to give policy advice untainted by the self-interests of actual science providers.

At the same time a semi-autonomous Foundation for Research, Science and Technology was established to give independent advice to the Minister and to allocate funding between science providers on a competitive basis.

Next year the new Institutes will have to bid against each other, and other science bodies, for just under 100 per cent of their funding.

DSIR — the Department of Scientific and Industrial Research — employs around 2,600 staff within 10 divisions and a corporate headquarters.

Already this year it had undergone a major internal restructuring whereby 23 divisions were consolidated into its present 10.

Prior to this latest internal restructuring, Divisions were organised into three groups similar to CSIRO's Institutes.

This group structure was abolished in July of this year, but something similar could now be resurrected with the move to stand-alone institutes, although the actual make-up and size of the institutes will not be decided until mid-1991.

By all accounts many divisional staff were happy with the proposed move away from corporate control, although many were concerned at the loss of both the commercial goodwill and the international reputation associated with DSIR's name.

Many are thought to be still reeling from the previous restructuring of less than six months ago.

Reaction from DSIR's chief executive Mike Collins to the scrapping of his department has been surprisingly muted, and while noting some sadness at the loss of the DSIR identity, he has openly supported the government's policies.

Former Director-General Jim Ellis has been less restrained, however.

When the National Party policy was revealed prior to the October election he attacked it publicly, saying it would further unsettle New Zealand science.

The success of DSIR as New Zealand's major science organisation had caused it to suffer the 'usual Kiwi-knocking syndrome', and the thought that other countries' systems were better, he said. 'We seem not to value a thing until it has died or emigrated.'

In a newspaper article he said Mr Upton joined the ranks of theorists who saw an answer to science problems in more restructuring.

'New Zealand is so tiny as to be fragile to the extent of being almost non-viable in a number of activities, including areas of science. Mr Upton uses policy concepts from large European countries where research institutes may individually be as large as the whole of DSIR.'

He said a multitude of small institutes would duplicate overheads and equipment. There would not be the overall management insistence on co-operation between science disciplines and a sharing of facilities such as existed within the DSIR.

One aspect of the government policy which has been more universally welcomed by scientists, however, has been the promised move away from increasingly commercially driven research.

Mr Upton said the institutes would be established under special legislation making it clear they were principally there to do 'public-good' research.

'I think there's been a tremendous amount of *angst* on the part of scientists in recent years as they have wondered whether they were really working increasingly for commercial organisations,' he said.

'We take the view that public sector scientists are basically there to do public-good research and we want to spell that out in the statute.'

Denis Anderson of CSIRO's Entomology Division worked for DSIR for five years until 18 months ago. While he thought the re-emphasising of public-good and long-term research would be welcomed, he was surprised that the DSIR identity could be so easily discarded.

'Overseas, people have always heard of DSIR, but if you mention the Entomology Institute of Auckland or whatever, people will go 'What?"

'It seems amazing to me because DSIR has got a good name worldwide. It's like you can talk to every Joe Blow over there, the ordinary person in the street, you mention DSIR and instantly people say 'Oh DSIR, yeah.' They have this positive view of the institution, yet somehow the government doesn't seem to regard that as meaning much. I couldn't see a place like CSIRO going that way, because again the public tends to support it so much.'❖

Simon Upton, New Zealand Minister of Research, Science and Technology: DSIR no longer an appropriate agency

Mike Collins, Director-General of DSIR: some sadness, but full support for government policy

Mike Collins

Is New Zealand shooting itself in the brain?

John Stocker offers a personal view on the dissolution of DSIR

I must say I was surprised at the decision of New Zealand's new National government to do away with DSIR, but of course it's nothing new for governments to flounder with science policy. In fact the Australian Science and Technology Council has recently released an excellent report on national priority setting in research in which they come to the conclusion that few countries have really got it right so far.

But the report also identifies three characteristics of successful priority setting:

- those leading the exercise have appropriate expertise and are accepted as legitimate;
- those carrying out the detailed analysis have technical credibility; and
- there is authority to implement the results.

CSIRO fills that bill, and has taken on the job of setting its research priorities.

The ability to make a success of this national leadership role and to follow through with the task is the best justification for a national research body. If CSIRO did not exist as a structure prepared to do this, then some other structure would have to be dreamt up.

Any such new structure would be most unlikely to measure up to the ASTEC checklist. It would be unlikely even to be sustainable: governments come and go, and change their fashions even while they're there. The people who made the decisions could be long gone when their results came home to roost.

CSIRO is one national research organisation that has proved it is capable of sustained delivery and is now prepared to look ahead at priorities, to redistribute its resources according to where it sees the nation's best opportunity. That's a pretty strong argument for government to support it vigorously. This seems to be happening.

I wonder though, as Chief Executive of CSIRO, what New Zealand is going to do about setting its national research priorities. I wonder whether they have really thought through the issues of the methodologies they need for doing that, and whether the new structure is really going to create for that country the ability to step back and look at what it's doing.

I am worried by the idea of disbanding something and then having to generate a new layer of bureaucracy, one without those attributes that have been identified by ASTEC as being necessary to set priorities.

The risk is that there will be a lot of squabbling for resources, and the settling of those squabbles will be in the hands of people who are neither technically qualified nor responsible in the long term for implementing their own decisions. That seems like folly. Not to mention their lack of the sort of internal and external credibility DSIR has surely built up over its sixty-four years of scientific service to the community. Its good name, in short.

Australia seems to have come through the period in which science policy was all about disbanding successful structures. The present Labor government is very much on-side with CSIRO's new priority setting approach, and we are getting good support from the Shadow Minister and his colleagues in both the National Party and the Liberal Party for the leadership role we are taking.

In fact this whole business of our setting national priorities has been attracting a gratifying level of attention. I've given presentations on it to the National Science and Technology Advisory Group, the Australian Science and Technology Council, the Co-ordinating Committee for Science and Technology, the National Farmers' Federation, the Parliamentary Party of the Australian National Party in Parliament House, and to the Departmental Secretaries from about six Commonwealth Departments. All these groups have shown great interest.

Finally, I'd like to wish all staff a very happy Christmas season. I hope you all find time to do the things that most appeal to you. As for me, I'll be out in the fresh air on my farm, tying up grape vines and thinking with gratitude about the warm welcome you have given me to this great organisation.

The ASTEC report to which Dr. Stocker refers in his column is titled 'Setting Directions for Australian Research / A Report on National Priority Setting'.

Letters to the Editor

Dear Editor,

Your apparently indefatigable correspondent, Alister K. Sharp, on the anniversary of what we initially took to be a hoax (his extraordinary and wrong assertion that Corporate Centre had allowed surreptitious budget cuts) has now discovered a dark plot to remove his access to technical translations.

Again, your correspondent got it wrong. Had he approached his Division's management instead of resorting to your pages, he'd have found that the Technical Translation Service has certainly not been disbanded.

He would have learned that Institutes were allocated the corporate funds previously used for technical translations and that in turn, his Division received an allocation for that purpose. He would also have discovered that a drop in demand for technical translations led to a reduction of the extent of the service. However, the service has continued and we are in fact in the process of translating Dr Sharp's article now that we have it.

The Library Network Committee has been involved in the Technical Translation Service changes, details of which have been sent to Chiefs and Divisional Librarians.

Satisfying what amount to Alister K. Sharp's personal needs for information via the pages of *CoResearch* is neither productive nor desirable and we enjoin him to participate in the CSIRO team.

B.J. Mithen
Assistant General Manager
Information Services Unit

Dear Editor,

Last edition's launch featuring Project Ambassador was very interesting and I think the concept is a terrific idea. However, I was extremely disappointed in the 'CSIRO's greatest hits' section of the grey insert.

I realise that it would be impossible to list all of CSIRO's past achievements; however, I think it should have listed at least one achievement from the north. The Divisions north of Sydney were once again left out in the cold (or should I say heat). As a Divisional communicator, it's going to be a tough job convincing the staff here of the value of Project Ambassador when they are treated as fringe dwellers.

I hope that this situation will be rectified in future publications and I look forward to the success of Project Ambassador across all of Australia.

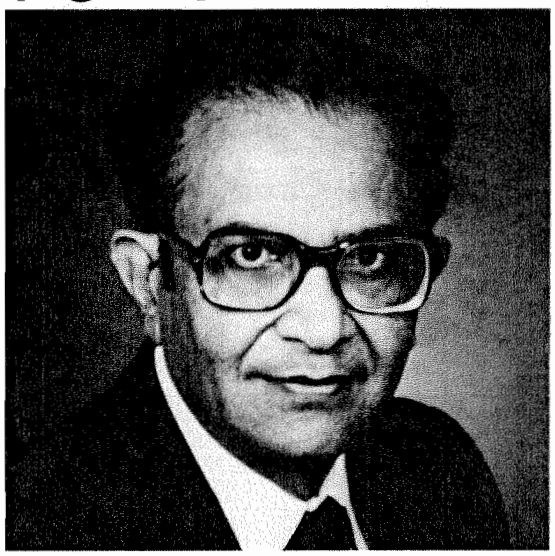
Jenni Metcalfe
Communications Manager
Division of Tropical Crops and Pastures

Dear Editor,

I have just returned from an overseas trip during which I was presented with some small mementos in appreciation of my visit. A U.K. scientist on the same trip was better prepared than I. He had brought with him some small presentation plates bearing his organisation crest and he used them to express his appreciation to his hosts. Perhaps we could learn from this. Perhaps CSIRO could consider the manufacture of some small presentation articles bearing our logo and perhaps a divisional motive as well. Possible articles include small plates (imitation is the best flattery), paper knives, and CSIRO ties. (There are some people who still wear them.) Constraints are that they need to be light and intrinsically attractive. Any other suggestions?

Jim Barrow
Division of Animal Production

Let's hear it (again) for Hari



The Institute of Physics, London, has awarded Dr P. (Hari) Hariharan its Thomas Young Medal for 1991.

This award, which was instituted in 1907 is made in alternate years 'without regard to nationality, in recognition of distinguished work in optics'.

Dr Hariharan worked initially at the National Physical Laboratory, New Delhi, and the National Research Council, Ottawa, and was Director of the Laboratories at Hindustan Photo Films, Ootacamund, and Professor at the Indian Institute of Science, Bangalore, before joining the CSIRO Division of Applied Physics in Sydney, where he is now a Chief Research Scientist.

Dr Hariharan has more than 150 publications in international journals to his credit as well as two books, 'Optical Holography' (Cambridge University Press, 1984) and 'Optical Interferometry' (Academic Press, 1985). He is a Fellow of the Institute of Physics, London, the Optical Society of America, SPIE, the Royal Photographic Society, the Indian Academy of Science and the Indian National Academy of Science. He played a prominent part in the formation of the Australian Optical Society and was its President in 1988. He is also Chairman of the Australian National Committee for Optics. He was elected to the Bureau of the International Commission for Optics as a Vice President in 1984 and is currently its Treasurer.

Dr Hariharan was the recipient of the Optical Society of America's Fraunhofer Award for optical engineering in 1989 and the Henderson Medal of the Royal Photographic Society of Great Britain earlier this year.❖

Einstein Award to Nossal

CSIRO Board member Professor Sir Gustav Nossal is this year's winner of the much-coveted Albert Einstein World Award of Science.

Professor Nossal was nominated for the award by an international jury of 50 members of the World Cultural Council, a group of some 300 internationally renowned intellectuals, including 20 Nobel Prize winners.

The award recognises Professor Nossal's pioneering discoveries in immunology, which revealed how cells make antibodies, and is only the latest in an imposing list of international prizes and appointments he has gained by his brilliant research.

He recently became the first Australian member of the French Academy of Science and was made emeritus professor of France's foremost health advisory body. Sir Gustav has been a consultant to the World Health Organisation for the past 20 years, and is a Florey Lecturer of the Royal Society of London. He was knighted in 1977 and made a Companion of the Order of Australia last year.

(Picture of Sir Gustav on p. 4)

Are the oceans getting warmer?

If we sit very quiet and listen they might tell us ...

In January 1991 scientists at receiving stations around the world will be listening for the first signals transmitted from a remote and chilly site in Australia's bleakest waters, 68 kilometres off Heard Island. They'll be listening carefully, because these signals will be the first hard data they've been able to get hold of that might help them determine whether the earth's oceans really are warming up as Greenhouse theorists have been claiming. It's an exciting moment for world science, and CSIRO is very much involved.

Andrew Forbes, a Senior Experimental Scientist at the Division of Oceanography in Hobart, was recently appointed a Green Foundation Visiting Scholar for a period of ten months at Scripps Institution of Oceanography at the University of California, San Diego.

The appointment, beginning in March 1991, came as a result of his work over the past two years with the Institution's Professor Walter Munk. They worked together on a joint American–Australian experiment aimed at using a new acoustic technique to measure global ocean warming.

Professor Munk, widely acknowledged as one of the world's leading oceanographers, is a pioneer in the field of ocean acoustic tomography, which is used to map vertical 'slices' of the 'velocity structure' of the ocean over distances of up to 1,000 kilometres.

It occurred to Munk that changes in the temperature structure of the ocean — which strongly influences sound velocity and is usually regarded as 'noise' in tomography — could influence the travel times of acoustic signals over very large distances. If, as many atmosphere and ocean physicists believe, the oceans will warm with the Greenhouse Effect, then travel times of acoustic signals along 10-15,000 km paths should decrease by about 150 milliseconds per year.

If he was right, then the difference could be measured.

Using a computer simulation to trace acoustic rays, Forbes started searching for a position on the globe from which sound signals could be heard simultaneously in all of the world's oceans.

The ideal location for an acoustic transmitter turned out to be near Heard Island, one of Australia's most remote territories, halfway across the Indian Ocean, in the freezing 'Furious Fifties' of the Southern Ocean.

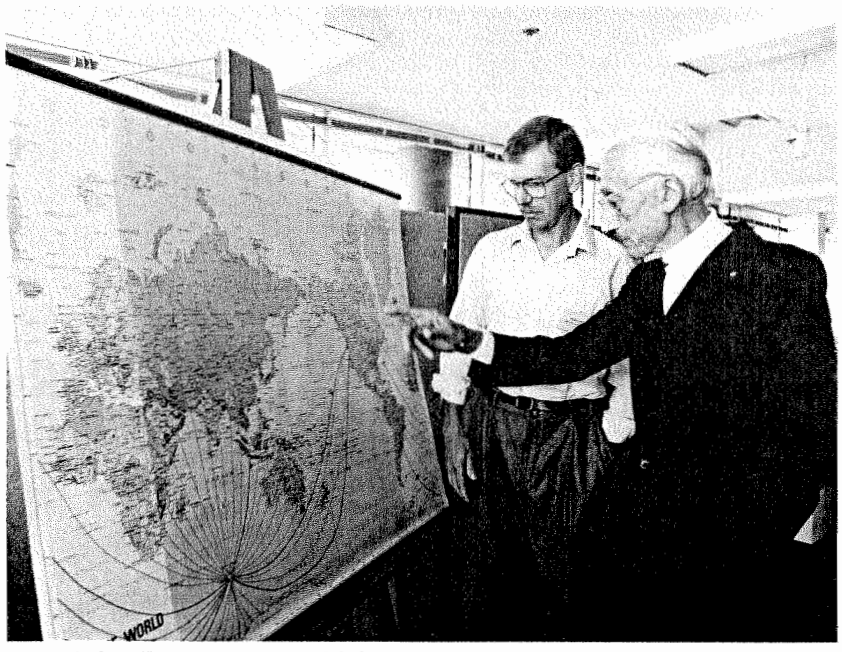
To conduct such an ambitious experiment from this inhospitable location was beyond the scope of a single institution, so a collaborative group of scientists from Scripps Institution, CSIRO's Division of Oceanography, the Universities of Washington and Michigan, and the Australian Antarctic Division was formed to plan and carry out the project.

In May and June this year, Forbes conducted an oceanographic survey of the proposed acoustic source site, 68 kilometres off Heard Island, on the maiden scientific voyage of the 'Aurora Australis'. It proved to be, in all respects, a suitable site, and so the plan was formed to carry out a series of test transmissions over a period of ten days in late January, 1991.

Twenty-one receiving stations around the world will listen for and record the signals from Heard Island. This will provide a 'snapshot' of global ocean temperature, something that has never been achieved before.

Over the next few years, a series of such synoptic views of the oceans should provide firm data on which it can be determined whether the oceans are indeed warming.

Forbes' appointment as a Green Scholar comes at a critical stage in the experiment, when the first results will be gathered from the global network of receivers. Professor Munk said 'You have taken a leading role in preparing for the experiment, and it is very important that you participate in the analysis of the observations'.❖



Above, Andrew Forbes explains the global ocean warming project to Jacques Cousteau during the famous environmentalist's visit to the CSIRO Division of Oceanography, Hobart, in February this year. (See CoResearch No. 331.) Photo by courtesy of the Hobart Mercury

CSIRO Medals

'refreshingly relevant' research

Well, it's all over bar the shouting. But there has been quite a bit of shouting over this year's CSIRO Medals, as the winners included the team of CSIRO scientists whose advice last year to the Federal Government on the Wesley Vale pulp mill landed them in the midst of fierce public controversy .

The team received one of this year's five highly regarded CSIRO Medals, which were formally presented by Professor Sir Gustav Nossal in Sydney on 27 November.

Oceanographer Dr Chris Fandry, marine ecologist Dr Bob Johannes and pulp mill technologist Dr Peter Nelson were members of a CSIRO team formed in March 1989 to deliver urgent scientific advice to the Federal Cabinet on the planned Wesley Vale pulp mill.

That advice, delivered two weeks later, pointed out major inadequacies in the proposed mill's environmental impact assessment. The Federal Government then made approval of the pulp mill conditional on environmental guidelines that had not yet been formulated. The pulp mill proponents said this was unacceptable, and abandoned the project.

The three CSIRO scientists were involved in drawing up the new guidelines, and their report, 'Pulp Mills: modern Technology and Environmental Protection', was a landmark document. It has been one of the most important factors in establishing CSIRO as an honest broker in Australia's environment debate.

Sir Gustav, high-profile member of the CSIRO Board and latest winner of the Albert Einstein Award (see story page 3) said the work of all the winners was 'refreshingly relevant'.

It showed, he said, that CSIRO was now willing to look at the consequences of its research as well as the pure science.

'One of today's winning teams in particular,' he said, referring to the Wesley Vale group, 'has been chosen largely for its preparedness to become involved in the debates and concerns of the nation, and for its ability to use good science to help resolve a contentious environmental issue.'

Other winners of CSIRO Medals included a Division of Animal Health team from Melbourne led by Dr Paul Wood. The team developed a new test for bovine tuberculosis that will save the Australian cattle industry an estimated $80 million and help rid the country of the disease.

Another Melbourne-based team, the Specialty Polymers Group from the Division of Chemicals and Polymers, won their Medal for developing innovative ways of making chemical polymers. The group, led by Dr Ezio Rizzardo, developed new techniques for making paints, plastics and other polymers with a wide range of industrial applications.

Dr Geoff Poulton and Dr Trevor Bird from the Division of Radiophysics in Sydney won a CSIRO Medal for their design of a spot beam antenna for the AUSSAT–B satellites. It will be used to produce shaped signal beams covering Western Australia, the North-West Shelf and Christmas and Cocos Islands.

Every year one CSIRO Medal goes to a research project from outside the Organisation, and this year the winner was a team from the University of Newcastle led by Professor Graeme Jameson. Professor Jameson's team developed a radical 'flotation cell' for separating minerals from ore using froth flotation. The technology is now used around the world to recover minerals such as lead, zinc, copper, gold, and even coal.

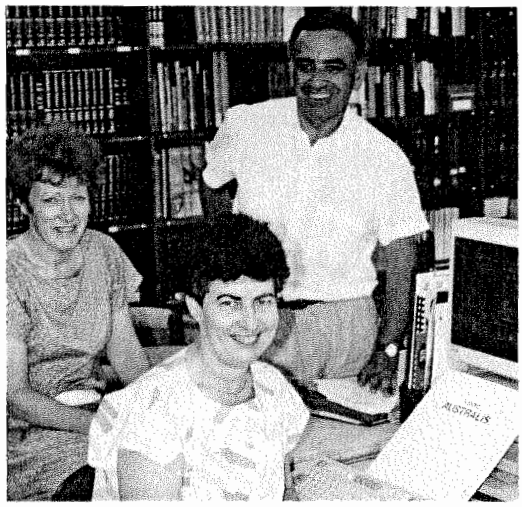
CSIRO Chief Executive Dr John Stocker said the CSIRO Medals were Australian science's equivalent to the Logie, AFI or Walkley Awards.

'To win a CSIRO Medal you really do have to be the best of the best,' he said. 'They recognise outstanding scientific achievements and research leadership.

'In each case today ordinary Australians will benefit from the great work these scientists have done.'❖

Back row, left to right, Dr John Stocker, Sir Gustav Nossal, Professor Graeme Jameson, Dr Peter Nelson, Dr Chris Fandry, Dr Bob Johannes, and Dr Paul Wood. Front row, left to right, Dr Ezio Rizzardo, Dr Geoff Poulton, and Dr Trevor Bird. Photo by Maria Basaglia, Division of Applied Physics

What do we need a corporate library for?



Left to right, Margie Enfield, Ramon Cornejo-Rios, and Helen Keenan, of the Corporate Library and Information Service. Photo by David Salt of Education Programs.

Well, for one thing, it's hooked up to CLINES — CSIRO's library network system. You might as well make use of whatever holdings the corporate library has as well as your own and those of all other Divisions. Can't hurt.

(In fact, the corporate library staff are rather puffed up about being the first library in the network to control its loans on CLINES.)

But apart from that they actually offer quite a bit you might not know about.

For example, the corporate library produces a weekly bulletin called SCANFILE, designed to keep readers on top of current issues in science and R & D policy.

SCANFILE consists of abstracts of journal articles of relevance to scientists and managers. It's something like a media-monitoring service, only more intellectual. The abstracts are condensed from articles in 300 Australian and international journals.

A new acquisitions list is also sent out with SCANFILE, showing the latest government reports and books.

The service is available to CSIRO Divisions for $100 a year, and includes photocopies of any article on request. (Outsiders pay more, of course.) Samples are available on request and you can place orders through your own library. And even if you don't order any articles, it keeps you abreast of the literature.

The SCANFILE data base (SCAN) goes back to 1982 and is available for searching online on CSIRO's AUSTRALIS system. Divisional libraries are welcome to make use of this rich source of science management information *at no charge*.

Other special features of CLIS (that's the Corporate Library and Information Service) include a large occupational health and safety video collection, CCINFO (Canadian Centre for Occupational Health and Safety) on CDROM, covering chemical information and OHS, and a television and radio monitoring service on request.

The corporate library is run by librarians Margie Enfield and Ramon Cornejo-Rios with the help of their assistants Helen Keenan and Phillip Hancock.

The main strength of the library's written collection is in science policy and management, but as the ACT arm of the National Information Network they also answer some 20 queries a day, both phoned and written. Some of these are referred to Divisions for technical or scientific help, but most are satisfied within CLIS. Staff are always on the lookout for emerging trends that might affect CSIRO and information that might help them cope with follow-up enquiries.

The corporate library extends a special plea to Divisions to give their Division, Unit, scientist's name, contact address and phone number to the media whenever they are reporting any research. This helps greatly in tracking down answers. (And it doesn't hurt CSIRO's publicity chances and reputation with the media, either!)

A gloss on the future

It's never too soon to be thinking about the 21st century. That's the view of the Commission for the Future, and to back up its belief it's joined forces with the ABC to produce a magazine of the same name, 21-C.

Science is expected to take pride of place in the line-up of articles for the quarterly magazine, which is produced in association with ABC-TV's Quantum program.

But as Commission for the Future Chair and Science Show presenter, Robyn Williams, emphasises, it will be science in a social context.

He praises 'lay people who've become thoroughly involved in scientific affairs'. There's no question the reverse process is of equal significance.

In the first issue of 21-C Williams draws attention to the need for people to come together from different walks of life to tackle national and global problems.

'In the 1990s we are chillingly aware of the nature of choice and, if we don't choose wisely, of the possible consequences,' he writes.

'With traditional politics in Australia being so much a matter of sloshing about, we need at least one small reminder that there is next decade, next century, even next millenium to think of.'

21-C draws on some of Australia's leading thinkers, in both science and art — for example poet Judith Wright, economist 'Nugget' Coombs, rock artist Peter Garrett and scientist Alex Pucci — to focus on how the world is changing as we approach next century.

Regular contributors will include David Dale and the ABC's environment series team.

As a 100-page colour glossy packed with information and thought-provoking views, 21-C will be hard not to notice.

It maintains science is sexy. If we want to make it lasting, a subscription to the magazine at a special offer of $30 wouldn't go amiss.

Enquiries to the Subscription Section, Australian Government Publishing Service, GPO Box 84, Canberra ACT 2601.
Phone (06) 295 1111 or (06) 295 1188.

Our very own batmobile?

Above, a miner clears the spiral radio-receiving antenna mounted on the shuttle-car, part of the 'proximity detector' — a new system developed by the Division of Radiophysics to improve mining safety. Photo by John Masterson of Radiophysics.

Australian coal miners often find themselves working in conditions where they are rendered almost as blind as the proverbial bat, and over the years this has led to some nasty accidents.

Well, why not do what the bat does? He sends out sound waves continuously, just in case. (A kind of whistling in what might otherwise be his graveyard.) When they start bouncing back too thick and fast he knows he's about to liaise with something hard, and takes appropriate action.

An investigation into the death of a coal miner in 1986 has led to the development of a new high-tech alarm system that uses something like the bat's highly effective whistling technique.

The management of Newcom Collieries, the district mines inspectorate and the miners' union found that the miner had been killed when he was crushed between the continuous mining machine cutting coal from a seam and the shuttle-car coming to collect it.

More importantly, they found that the accident happened because underground coal mines are so dark and noisy that the shuttle driver finds it hard to see the miners and they find it hard to hear him. It was easier to explain why the miner had died than why others hadn't.

After a brief shudder, they approached the government for funds to make sure the same thing didn't happen again.

The Federal Government agreed to fund a working party from Newcom Collieries and the Australian Coal Industry Research Laboratories through its National Energy Research Development and Demonstration Council. The working party then asked CSIRO's Division of Radiophysics to design a system able to warn miners of a possible collision as two vehicles approach each other.

Radiophysics has come up with the 'proximity detector', a device that uses radio waves and ultrasound to measure the distance between two vehicles. An alarm goes off when the converging vehicles are still 10 metres apart.

The system is tough enough to work reliably, without human intervention, in the harsh conditions of an underground mine. It has been successfully tried out over the last few months at Myuna Colliery on the central coast, and is ready for commercial development.

Launching the new device on 28 November, CSIRO Chairman Neville Wran said the proximity detector would have applications beyond mining, since it could be used in any situation where two vehicles had to approach each other without colliding.

For example, he said, it might be used at airports.

❖❖❖

Animal Production scientist to be Professor at UNSW

Climatic stress — particularly heat stress — will become more and more important as the greenhouse effect raises world temperatures and as the average age of populations increases.

The effects of this sort of stress have long been the special study of Dr Robert Hales, until recently a Chief Research Scientist at the CSIRO Division of Animal Production at Prospect. He has edited three books on heat stress, and has concentrated his research on cardiovascular aspects of heat stroke.

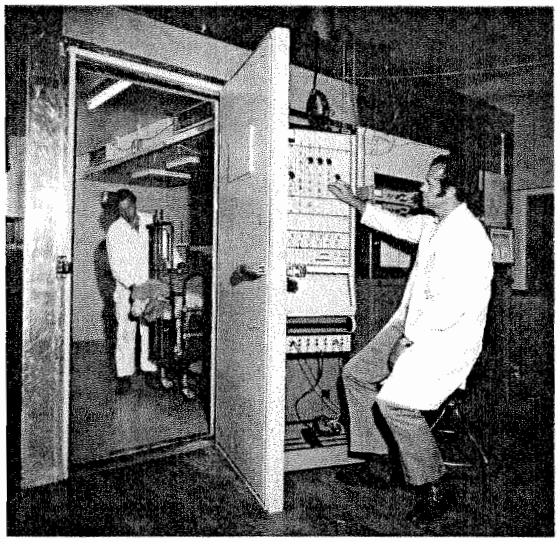
Now, by virtue of a co-operative agreement signed on 28 November, he is to be Research Professor of the School of Physiology and Pharmacology at the University of New South Wales, where he will remain for five years.

The University wants him to continue his research into integrative physiology, paying special attention to heat stroke in humans.

Under the agreement, CSIRO will continue to pick up the bill for Professor Hales' salary and other expenses.

The simultaneous transfer of Dr Hales' research assistant of over 20 years, Mr Alan Fawcett, and his experimental equipment, will allow him to continue, with minimal interruption, his researches into the effects of heat stress and mechanisms of thermal regulation in sheep.

The University of NSW has recently assigned a General Development grant of $80,000, and the Ramaciotti Foundation has granted $40,000, for Professor Hales to establish a research and teaching program in thermal physiology.❖



Dr Bob Hales, right, adjusts conditions in the climate chamber, while Alan Fawcett checks one of the experimental sheep used to study the physical effects of heat stress. He will continue the same studies in his new position at the University of NSW.

Mimosa pigra threatens Kakadu

Members of the House of Representatives Standing Committee on the Environment, Recreation and the Arts got to see the Mimosa pigra problem of Northern Territory wetlands first hand on their recent visit to Darwin.

CSIRO Division of Entomology scientist, Dr Mark Lonsdale, took the Committee on a tour of the devastating weed, which already has formed dense impenetrable thickets across 80,000 hectares of the Top End's wetlands and threatens the World Heritage listed Kakadu National Park.

Dr Lonsdale, who is based in Darwin, is working on the ecology and biological control of Mimosa. The House of Representatives Standing Committee was in the Northern Territory as part of its national inquiry into the protection of the coastal environment.

Pictured above, inspecting Mimosa pigra on the Adelaide River floodplains in the Northern Territory are, left to right, Harry Jenkins, MP for Latrobe, Victoria, Alistair Webster, MP for Macquarie, NSW, Dr Mark Lonsdale, CSIRO Division of Entomology, and David Crawford, Project Officer.❖

Preparing Budgets for Grant Applications

Have you prepared a budget recently for submission to a potential grantor? If you have you will be aware of the repercussions of failing to include all possible expenditure items.

The MIS Branch of the Corporate Service Department has developed a computer system to help Divisional staff prepare budgets for grant applications. The system is called JOBCOST, and was released to Divisions in October. It is also very handy for costing jobs within your Division.

JOBCOST includes a checklist of budget items in the salary, travel, assets and operating categories. You can add budget items to any of these categories at any time.

The system is linked to personnel and designation data to ensure that accurate salary costs are included in your grant proposals. It enables you to nominate specific staff by ident, or to nominate the appropriate designation. A percentage of time on the project for each person can also be nominated.

JOBCOST includes default salary on-cost percentages. However, you can change the defaults to suit your own requirements.

It also lets you include a salary margin in your calculations. The margin can be on either direct salary costs or direct salary costs plus salary on-costs.

JOBCOST was designed to be used by either administrative or research staff. If you are interested in using it, either to prepare a budget for a potential grant or as a job costing exercise, you can find out more from the admin people in your Division.

North Ryde revamp — an update

The North Ryde complex is one of CSIRO's major research centres and one of its most valuable assets. The pressing need to improve the facilities for CSIRO scientists there and the pressure on all government-funded organisations to pay more of their own way have resulted in some innovative plans for the site.

Late in 1988 a Parliamentary Public Works Committee approved the construction of new laboratory facilities for the Divisions of Exploration Geoscience and Biomolecular Engineering, a new internal ring road and traffic lights to control entry from Delhi Road. For its part CSIRO agreed to give high priority to building a new fire-testing facility at the National Building Technology Centre (NBTC) when it was transferred to CSIRO.

In the event, the Government has been unable to fund the construction of these new facilities, and has told CSIRO to find ways to pay for them from within its own resources.

The Government noted that the North Ryde site had a considerable amount of under-utilised 'surplus' land, particularly after the transfer of the former NBTC site to CSIRO, and considered that the sale of some of this land could finance the construction of the required facilities.

So, over the past 12 months a working party, with the help of Rice Daubney (consultants), has been developing options for setting up new research facilities at the North Ryde site.

They have come up with a Strategic Plan for rationalising and redeveloping the site, and the CSIRO Executive Committee and Board have given it the go-ahead. The plan allows for the setting up of a child-care facility.

Dr Alan Reid, Director of the CSIRO Institute of Minerals, Energy and Construction, is chairing a committee set up to oversee the Strategic Plan's implementation.

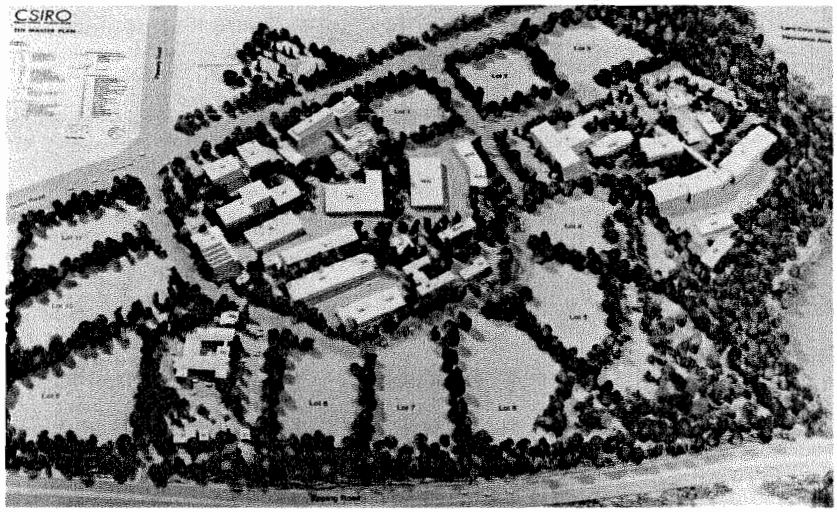
The next big hurdle will be to get formal approval of the plans from the Parliamentary Works Committee.

In the meantime a Project Manager will be appointed to provide expert management assistance for the development. One of the Manager's first tasks will be to organise detailed consultation with staff employed at the site to work out ways of accommodating their special requirements.

Dr Reid said that such detailed consultations will be needed to decide the actual workings of the plan and make sure there is the least possible disruption to staff while the development is going on.

He said that CSIRO had a unique opportunity to develop and implement a plan to meet research facility needs at North Ryde for the next 20 years.

'The Strategic Plan is based on the best available independent advice,' he added, 'and the project, as it proceeds, will be managed by experts in property development and management. We intend to see that CSIRO gets the best possible long-term outcome for its scientists and organisation.'❖



Above, a model of the proposed redevelopment of CSIRO's North Ryde site

Australia wins Spanish gold

1,000,000 Pesetas sounds more glamorous than A$12,800, but either way it's a good amount to win with a video about fire.

That, and the 'Golden Fireman' Trophy is what a joint CSIRO–Melbourne University video recently earned when it was awarded first prize at the highly regarded 'Video-Fuego 90' contest in Spain. The only Australian entry, it won against stiff competition: 51 film and video documentaries on the subject of fire, from the USA, Great Britain, France, Sweden, Canada, and, of course, Spain.

The video combines results of CSIRO's field and laboratory research, carried out by the Division of Building, Construction and Engineering, and architectural advice from Melbourne University's Department of Architecture and Building. With actual bushfire footage and explanatory graphics it answers the questions: What are bushfires like? How do they spread? How do they destroy your home? What can you do to build a better house, or renovate the one you have to protect it against the next bushfire?

The video has won a previous award, the 'Silver Mobie', from the Australian Chapter of the International Television and Video Association.

The 20-minute video, called 'Buildings and Bushfires — Improving the Chances of Survival', is available from —

Video Education Australia P/L
111 Mitchell Street
Bendigo Vic 3550
phone
(054) 422433
or, toll-free
(008) 034282

Wran: CSIRO has regained leadership

Neville Wran thinks CSIRO has come to terms with the changes of the past decade and regained its leadership in the Australian community.

Mr Wran made the statement in his 'Chairman's Foreword' to the CSIRO Annual Report for 1989–90, tabled in Parliament on 6 December.

Science and technology had won greater recognition from both the public and the government in the last year, he said, and that had meant more recognition for CSIRO and more money for its research.

'Over the past year CSIRO has found itself much more in the public eye — and this is how we want it to be,' Mr Wran said. 'We welcome our role as 'honest brokers' in policy debates in areas of our expertise.

'Our most public involvement was in the Wesley Vale pulp mill debate, where our independent scientific advice had a major influence on the outcome.

'We are continuing to work with Government and industry to find acceptable solutions to the management of Australia's forests — essential to reducing our annual $2 billion deficit in timber products.'

The Report also detailed some of CSIRO's most striking scientific achievements for the year, including —

- new statistical models to help the Ford Motor Company conduct crash tests of its 'Capri' for export to the United States;
- mineral processing work with the Queensland Metals Corporation to help make products from the company's large magnesite deposit at Kunwarara;
- the Young Eucalypt Program: a way of boosting wood yields in eucalypt forests by innovative management;
- a new vaccine to prevent the livestock disease lupinosis, which costs industry about $100 million a year;
- a fast-working microwave reactor that is revolutionising laboratory work and industrial processes;
- the start of a major land and water care program aimed at finding practical solutions to land degradation and water pollution.

New biology text for schools

Dr Jim Peacock, Chief of the Division of Plant Industry, is Chairman of an Academy of Science committee that has just released an impressive new biology text book.

Jim Peacock: 'Not many people are able to go to an expert in every topic, as we were able to.'

For well over 20 years now the standard biology text in high schools has been *The Web of Life*, but the Academy's new production, *Biology — the Common Threads*, may change all that.

Whether, or to what extent, the text will be adopted in high schools is not known. It is aimed at Year 11, but there are many competitors, and the choice will be up to individual teachers in individual schools.

But where it is used it can hardly fail to do a great deal for the image of CSIRO: of the 74 scientists contributing articles in the new book, 32 are presently working in CSIRO. And apart from the authors, much of the subject matter is drawn from CSIRO as well. 'An enormous amount of the material in the book,' said Dr Peacock, 'is CSIRO's discoveries and doings'.

The approach the committee took was to identify the best possible scientists in Australia in the various subject areas and ask them to write a few pages on the topic they were expert in. The scientists also suggested diagrams or photographs.

Then the committee's own team of writers 'rewrote everything to try to make it more homogeneous and [to put it] into a language suitable for high-school children'.

'What's come out of it,' said Dr Peacock, 'is something that you couldn't expect any other textbook really to have, this enormous range of quality [material] right across biology; not many other people are able to go to an expert in every topic, as we were able to.

'We started planning about three years ago, and the hard-working part of the book we did in the remarkably short time of about 18 months, I think. We've got a second volume being prepared now, and it will come out in about 10 months' time.

'This one is basically aimed at Year 11. The second volume will have more abstract concepts and will deal with the cellular and molecular aspects of biology, which is more suited to Year 12.'

High schools may be where the new book will — and should — have its greatest impact, but Dr Peacock thinks it could go down well with the general public too. 'I think it's very readable,' he said, 'and because there's such a high Australian content it's really very interesting'.❖

CSIRO wins more contracts from Boeing

A CSIRO team comprising staff from four Divisions is back home after a visit to the Boeing headquarters in Seattle, USA, with contracts pointing to a fair body of future work.

The purpose of the trip was to review existing projects worth $12 million and to discuss with Boeing planners details of new projects worth a further $6 million.

The Australian contingent was led by the Managing Director of Sirotech, Dr Colin Adam, and included project managers Dr A.V. (Rama) Ramamurthy, Division of Materials Science and Technology, Dr Jonathan Hodgkin, Division of Chemicals & Polymers, Dr Warren Thorpe, Division of Manufacturing Technology, and Dr Keith Ryan, Division of Applied Physics.

Dr Ken Hews-Taylor, Manager, Acoustics and Mechanics, in the Division of Applied Physics, Mr Trevor Thacker, General Manager, Commercial Development, in the Institute of Industrial Technologies and Dr R. H. (Bob) Frater, Director of the Institute of Information Technologies, were also present to discuss future projects.

Mr Thacker said the existing projects were all on schedule.

'Boeing was pleased with our progress and we are also Looking towards an increase in new work to be undertaken,' he said.

'The expansion in the number of projects is a good indication of the successful relationship between the CSIRO and Boeing being enhanced.'

Mr Thacker says some of the CSIRO's technological developments could be applied in Boeing's new 777s.

In October Boeing announced an order worth $US22 billion from United Airlines, which included 34 firm orders for the new wide-body 777.❖

Apology

The November issue of CoResearch, No. 336, carried a story on page 3 entitled 'Field trials of new bacterium begin'.

The second sentence should have read 'The original Pseudomonas bacterium — used in control of the wheat disease 'take-all' — has been genetically 'tagged' to distinguish it from other similar soil micro-organisms, allowing its path to be tracked in the soil.'

In transcription the words 'used in control' were lost, giving the false impression that the bacterium itself causes the disease. In fact 'take-all' is caused by a fungus, and the Pseudomonas bacterium, far from causing the disease, has been used to control it. I apologise for any confusion this may have caused.

•••

Readers please note: as usual there will be no January issue of CoResearch. No. 338 will appear in early February. So have a great holiday season! — Ed.

From Brisbane to Nigeria, it's all in a day's work

Nigeria is a long way from Australia, but getting to know the locals is all in a day's work for Brisbane resident, Mr John Hodgkinson.

As a Senior Technical Officer with the Division of Tropical Crops and Pastures, he was called on recently to deliver a training course on hand-held computers to Nigerian scientists.

He said he leapt at the chance to run a course that could help developing countries improve their skills in agriculture and animal husbandry. Many of his students were experts in these fields, but still had a lot to learn about computers and, specifically, how they could be put to use to gather data in the field.

'While I got a great deal of personal satisfaction out of giving the course, travelling to Nigeria gave me a valuable insight into how scientists deal with local problems,' he said.

'Also, CSIRO and Australia should benefit from the exchange of information on farm and land management that an opportunity like this offers.'

Mr Hodgkinson said the Australia–Nigeria link should be strengthened next year by a proposed visit of Nigerian scientists to Queensland University at St Lucia.

He hopes to be recalled to Nigeria at a later date. 'I'd leap at the chance to do it again, and given that the Nigerians are thinking about more data management courses there's a good chance — but money is tight,' he said.

Sponsored by the Crawford Fund for International Agricultural Research, CSIRO's John Hodgkinson is one of many scientists and technicians travelling the world helping people in developing countries.

'The main aim is to train people so they can train others,' he said. 'And I hope my Nigerian visit has done just that.'❖

Above, Senior Technical Officer John Hodgkinson, left, shows a team of Nigerian scientists how to use computers to improve their understanding of the environment.

Merilyn Sleigh woos Apex

Dr Merilyn Sleigh, Assistant Chief of the Division of Biomolecular Engineering, had a chance last month to do her bit for CSIRO's new Project Ambassador campaign.

Using our recent submission to the Public Accounts Enquiry as a source of information, she prepared a talk for her local Apex Club in Sydney. Some of the CSIRO successes she described for her audience were

- Interscan;
- the Ford Capri crash testing;
- biological control developments such as myxomatosis and water hyacinth control;
- our improvements in wool-spinning technologies; and
- the $10 banknote.

Dr Sleigh followed this list of triumphs with some discussion of the increased commercial focus of CSIRO, and how we are now choosing research areas and priorities. And of course she spoke of some of the work of her own Division, Biomolecular Engineering, in particular.

In spite of coming right after a speech by Kathryn Greiner — which Dr Sleigh described as 'a hard act to follow' — the talk stimulated lively interest and a barrage of eager questions. (What was CSIRO doing about cockroaches and the cane toad, for example?)

'*They* told *me* about some CSIRO successes I had never heard of!' said Dr Sleigh.

Discussion far outran the time allotted and the 'Contribution to the Nation' booklets 'went like hot cakes'.❖

New honour for DIT Chief

AURISA? The letters stand for Australasian Urban and Regional Information Systems Association Inc., and it's the peak body of professionals in the field of land and geographical information. AURISA has named Dr John O'Callaghan, Chief of the Division of Information Technology, as its Eminent Individual for 1990.

The award is given for individual contributions to the development, support and promotion of urban and regional information systems. In particular, Dr O'Callaghan's contribution in creating CSIS (the Centre for Spatial Information Systems) was emphasised, as well as the depth of his interest and the duration of his active participation in the field.

AURISA's president, Mr Harry Darlington, presented the highly regarded award at the opening of the AURISA conference in Canberra on 21 November. Dr O'Callaghan acknowledged the importance of the award, but claimed the honour for his colleagues at CSIS as much as for himself.❖

CSIRO man to oversee Telecom–OTC merger

At the Government's request Mr David Hoare will now be in charge of the interim Board they have set up to oversee their recently decreed merger of Telecom and OTC.

Mr Hoare is no longer a member of the CSIRO Board, having completed his four-year term on 4 December.

Another CSIRO Board member who has accepted a government appointment is Dr Tony Gregson. He will join the Grains Research and Development Corporation.

Dr Gregson had also completed his term as a CSIRO Board member, but has been re-appointed for a two-year term from 5 December 1990.

***CoResearch* is produced by the Public Affairs Unit for CSIRO staff and interested outsiders. Readers are encouraged to contribute or offer suggestions for articles. Stories may be reproduced, provided acknowledgement is given to both *CoResearch* and CSIRO. The deadline for contributions is the 15th of each month, but earlier is better, as issues fill up fast. Editor: Liz MacKay, PO Box 225, Dickson ACT 2602. Phone: 06 276 6567. Fax: 06 276 6641.**