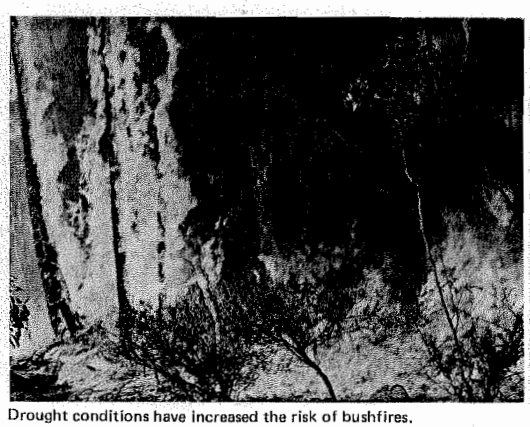
Coresearch

A monthly publication for CSIRO staff

January 1978 219

Bushfire knowledge proves relevant

Bushfires in the Blue Mountains of New South Wales, with a tragic loss of life, have brought home to most people just how serious the situation is this summer. Coresearch is therefore highlighting some of CSIRO's research into the predicting of bushfire potential and frequency, and what to do if a fire threatens you or your home.



Drought conditions have increased the risk of bushfires.

In the Canberra Division of Forest Research for example, Alan McArthur has designed a pocket-sized cardboard meter which is the basis for most bushfire warnings on press, radio and television in Australia.

The meter, which is simple, easy to use and can accurately show how quickly a fire will spread, is soon to be used by Mediterranean countries.

A special panel has recommended the testing of the meter to a United Nation's FAO/UNESCO meeting on forest fires in that region.

The meter works on a series of pivoted cardboard discs to indicate fire danger at low, moderate, high, very high or extreme levels.

Its pivoted discs can be rotated independently and set to take account of seasonal drought, recent rainfall, temperature, relative humidity and wind speed.

When the information is fed into the meter, the fixed outside disc will indicate the existing fire danger and a fire's rate of spread.

Armed with this information fire controllers at all levels can assess the chances of fires starting, how quickly they will spread and how difficult they will be to control.

Alan has just finished redesigning another meter for grassland areas. The new design is able to take into account different pasture types.

Frequency

Other staff at the Division have been studying the frequency of serious fires in the 30 years to 1975.

One of the scientists concerned with this research program, Mr Phil Cheney, has found that the coastal strip from Bairnsdale in Victoria to Newcastle in NSW is the most hazardous area for fires in Australia. The zone includes the area west of Sydney to the Blue Mountains.

'The most devastating fires in terms of monetary damage and lives lost have been the high-intensity forest fires which have burnt into the suburban fringe developments of the major cities,' he said.

'We expect that the number of fire disasters in urban/forest areas will not decrease even with the more efficient fire suppression techniques now being used.'

Despite improvements in fire control, Phil said, large fires will still break and burn out of control in extremely hot and windy weather and where there is abundant fuel.

In pastoral areas, although there may be fewer large fires in future, the damage they do may be greater as improved pastures create more fuel.

'When a fire burns on a day of extreme fire danger,' he continued, 'any fire fighting technique will be largely ineffective. Life and property can only be protected if individuals reduce hazardous fuels like grass, scrub, rubbish and firewood from around their houses and at strategic areas on their properties.'

Brochure

In Melbourne, the Division of Building Research has produced a brochure with the cooperation of the Country Fire Authority of Victoria and Australia Post which gives some serious advice on staying alive if a bushfire should threaten your home.

Entitled 'In Case of Fire', the brochure provides information which may be of interest to CSIRO staff and friends and neighbours.

On a day of total fire ban...

On a day of total fire ban, or when bush or grass fires are burning in your district...

- Check that rubbish and other burnables including leaves, twigs and fallen branches have been cleared from around the house.
- Check that spouting and roof gutters have been cleaned out.
- Check that water supplies are adequate.
- Connect hoses to taps, but remember that mains pressure may fail.
- Place pumps and drums of water around the house exterior: make sure the pumps are working.
- Fill knapsacks and put them in convenient, shoulder-high positions.
- Keep axes, shovels, hoes and rakes handy.
- Keep ladders handy—one for climbing on to the roof, and another for use inside if it becomes necessary to open a manhole and inspect the ceiling.
- Keep valuables, including insurance policies, within easy reach.
- Move stock to safe areas.
- Know where the children are, and what they are doing.

When fires are close by...

If your house is under a cloud of smoke, or if you can detect a strong smell of smoke...

- Close all doors and windows.
- Bring children and pets inside.
- Ensure cars are out of garages and on bare ground, away from combustible materials such as dry grass.
- Close car windows and leave keys in ignition.
- Fill household sinks and troughs with water.
- Leave buckets of water inside the house (along with mops or garden sprays) for use if curtains and other furnishings catch fire.
- Dress children and adults in long trousers (or jeans) and long sleeved shirts. No shorts, no dresses or skirts which don't protect the legs. Do not wear thongs—strong shoes are a must.

If you can see the fire...

- Check for and extinguish any small fires which break out near the house.
- Go inside when fire is very close, but continue to watch its progress.
- Keep checking each room for 'spot' fires.
- Check ceiling periodically.

If the house catches fire...

If the house catches fire and you cannot put it out...

- Stay inside near a door which leads outside. The house will take some time to burn.
- Do not leave the house until you can no longer stand the smoke and heat.
- If you are forced to leave protect yourself with a blanket: run to the car and lie on the floor. Cover yourself with the blanket.

When the fire has passed...

Stay on burnt ground, drink water frequently.

If the house has survived, continue to check that it does not catch fire from flying sparks.

Wait for help...

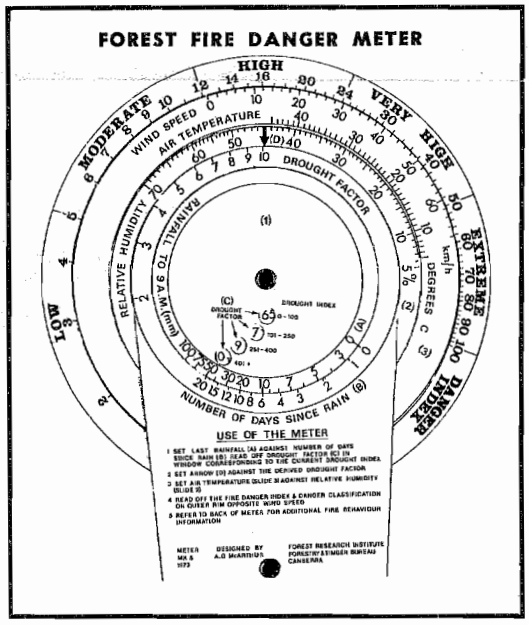
Do not walk or drive over unburnt country. You will be found more easily if you stay with your house or car.

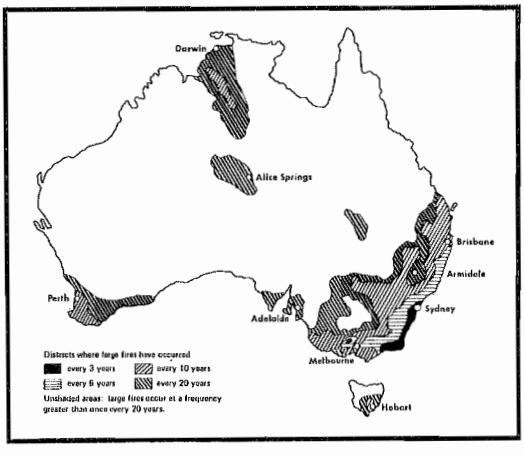
Be prepared...

The smoke will hurt your eyes, and it will be difficult to see. There will be a lot of noise. Communication, even by shouting, will not be easy.

Keep calm...

Do not panic. Your survival inside a house or car is almost certain.





Research takes ecclesiastical turn in WA

Highett's Division of Building Research, spiritually nudged and guided by Perth's Division of Land Resources Management, has finally come unto the fold. Ecclesiastical research is on the up and up or (dare we say it) they are now aspiring to higher things.

The story began a couple of months ago when Justin Murphy (LRM's Liaison Officer) received a call from the verger of a charming old ivy-covered sandstone Perth church. All was not well with the earthly structure—paint was blistering and peeling from walls, salt was encrusting on the blisters, and rising damp was rising fast.

'Beelzebub? Mephistopheles? Satan?' thought Murphy, suspiciously. Probably not, he concluded, and immediately thought of Bob Couper instead, the inscrutable, debonair and at times pontifical roving trouble-shooter from DBR in Melbourne. Murphy knew that Couper would soon be in Perth on a Divisional crusade, so he booked him for an appearance at the clammy cloister.

So early one sunny December morning, Couper was to be seen reverently chewing at his sunglasses, minutely inspecting spires, belfries, parapets, leadlights, flashings, footings and damp courses, breathing incantations all the while.

An eerie hush descended as he pondered; the passing rush-hour traffic somehow slowed and became less raucous, and an air of expectancy spread around. Robins and thrushes gathered in the trees, small creatures emerged from the hedgerows, and everyone waited...

And then, a blinding flash, and thus spake Couper...

'Grow ivy, much more ivy! It's all happening on the weather wall. The cruel winter westerly winds of Perth are driving the bleak rains constantly at this unfortunate divine structure, and the unprotected western wall is suffering. Thousands of little green leafy umbrellas are what we want, and it wouldn't hurt to stuff up some of the worst cracks in the wall too!'

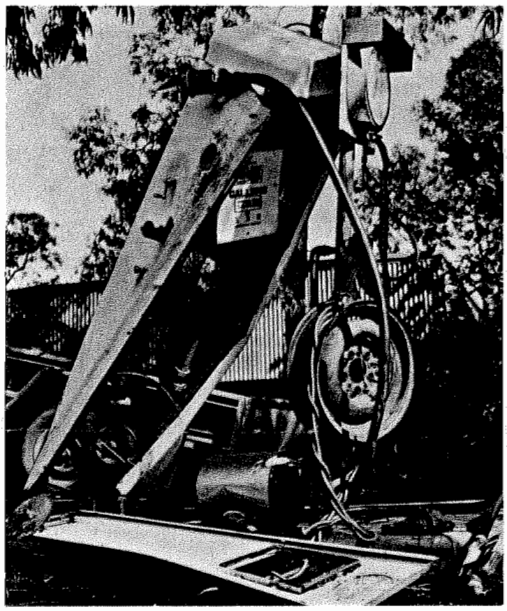
And indeed, the worthy Couper was truely correct.

The trouble was that some years ago the parishioners had rendered and painted the inside surface of the wall, and that was when the trouble began.

The wall which had once breathed happily now could not, because the render was in the way.

Not wishing to recommend that they go to the expense of de-rendering the whole surface, Bob was suggesting a true remedy of nature, plus a few more technical suggestions like attention to the flashing, gutters and so on, which were of venerable appearance.

And with those words, Couper continued on his healing way. The pall of gloom was lifted, and birds sang once again around St. Albans.



I felt such a fuel!

LRM's Justin Murphy, a staunch practitioner of Murphy's Law which states that if a thing can go wrong it will, was driving a CSIRO vehicle one wet morning (an event in itself in Perth at the moment) when he realised the car needed petrol.

He drove it to the on-site bowser at the Floreat Park Labs and the filling proceeded in the normal way.

Justin went into the office, signed the appropriate sheets, waited for a lull in the downpour, and sprinted (well, moved somewhat faster than usual) back to the car.

The car was started and Justin pulled smartly away from the bowser.

To his surprise, he noticed, in the rear view mirror, that the bowser was following him.

At least it followed him for a short distance before falling over.

The bowser attendant suggested that the hose should have been removed from the petrol tank before pulling away.

Photographer Bill van Aken unkindly captured the damage on film as a permanent reminder.

Tony Culnane is new RAO in ACT

Tony Culnane has been appointed Regional Administrative Officer in Canberra. He has been acting RAO since the retirement of Ken Prowse in September.

Tony joined CSIRO in 1965 and has held various positions at Head Office (Melbourne and Canberra), the Division of Soils, the Division of Entomology and the RAO Canberra.

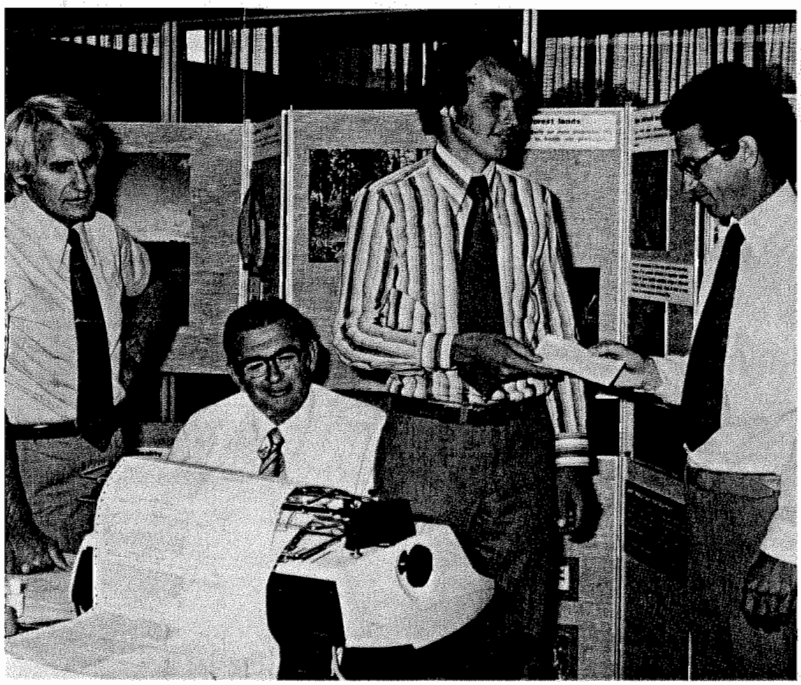
Tony Culnane

He was the liaison officer for the transfer of the Forestry and Timber Bureau to CSIRO in 1975 and for the recent transfer of the Materials Research Laboratory in Adelaide to CSIRO.

Tony is a director of the Laboratories Co-operative Limited and a member of the ACT Regional Committee of the Technical and Trades Staff Development Advisory Committee.

He is an external student at the University of New England, Armidale, NSW, and expects to complete a degree course in Social Science shortly.

New system at RAO, Perth



The Regional Administrative Office, Perth has begun accounts payable activities. Previously the RAO Melbourne paid all accounts in WA. The new system will allow for faster processing and payment of claims. Dr Norman Adams (right) of the Division of Animal Health receives the first check produced in Western Australia from Tim Dean, Head Office. On the left is John Brophy, Regional Administrative Officer, and seated is Ken Turner from the RAO Brisbane.

Staff Development publication

The CSIRO Staff Development Group is planning a regular journal this year to keep all staff in touch with its programs.

These include a wide ranging technical and trade staff development program, senior and middle management conferences, counselling and selection interviewing, group dynamics seminars, public speaking, letter and report writing and clerical induction

While the title of the journal has not yet been officially conferred, 'Sirostad' is the current favourite, the last letters standing for Staff Training and Development. No prizes will be awarded to those who suggest alternatives for the 'a'.

The journal will include articles and features on staff development, reports on programs and appropriate news from round the ridges. Each issue will feature a lead article by an outside consultant or other leading personality.

The first issue will appear April/May but after that it should be produced each March, July and November.

The publications committee includes the head of the Group, Don Gwynne, his offsider Ian Jackson, editor of the journal, Ron Murnain, Development Group Staff Section, Dorothy Braxton, CCU, and Heather Kidd, CILES.

The Regional Committees conducting Technical and Trade Staff Development also publish newsletters on their activities. The journal is not intended to diminish the purpose of these newsletters. 'Sirostad' will include material from the regions and provide a co-ordinating media for all staff development activities.

Study Awards

Application forms and information sheets for the 1978 CSIRO Study Awards are now available. The applications must reach Head Office on or before 1 March.

NML

Most of the staff of the National Measurement Laboratory have now moved to their new address at Bradfield Road, Lindfield, NSW, PO Box 218, Lindfield, NSW 2070. The telephone number is 467 6211 STD 02.

Annual Pye Dinner

The F.C. Pye Field Environment Laboratory of the Division of Environmental Mechanics at Canberra held its 1977 Dinner late last year. The function is an annual event in honour of Mr F.C. Pye, the NSW grazier whose gifts to CSIRO enabled, among other things, the building of the Laboratory. Unfortunately, Mr and Mrs Pye were unable to attend the dinner this year but the show still went on.

In addition to the staff of the Division, the guests included three members of the Executive, Dr N.K. Boardman, Dr A.E. Pierce, and Dr H.W. Worner, and their wives; Mr B.E. Butler, retired O-i-C, Canberra Labs, Division of Soils; and Dr E.M.O'Loughlin, of the Division of Forest Research.

Now what did Dr John Philip, Chief of the Division of Environmental Mechanics (standing) say to Dr Keith Boardman at the dinner? Whatever it was it left Dr Boardman smiling and two other guests, Dr David Smiles and Professor Robert Mansall (right) wondering.

Make mine milk

Workmates raise their milkshakes as Brian Banks wishes Robert Sonnet (with hat on) good luck in his new career as a missionary.

A long standing tradition at CSIRO's Printing Unit at Rokeby Street, Melbourne, was broken just before Christmas when the Unit's staff said goodbye to one of their workmates, Robert Sonnet.

Instead of drinking the customary glasses of amber liquid that would normally have been downed on such an occasion, Robert and his colleagues said their farewells with milkshakes! Moreover it was Robert who went out and bought the 32 drinks.

Breaking with the tradition was the 'last wish' of Robert before he takes up his new work as a missionary for the Church of Jesus Christ of Latter Day Saints in Western Australia.

Robert joined CSIRO as an apprentice to letterpress machining in 1974 and has been responsible for all the letterpress halftones over the past three years.

Described by his workmates as 'a most likeable chap', it is nevertheless on record that throughout his employment with the Organization, Robert didn't succeed in making a single convert.

That's not to say he didn't try. He loved music and his deep bass voice was frequently heard booming around the printery, though not always to the enjoyment of some of his colleagues.

It has been said, in fact, that his singing had a stirring effect on his supervisor, Brian Banks, but not necessarily in the way that won ecclesiastic acclaim.

Robert won the admiration of his colleagues when he set out to save enough money to be completely self-supporting throughout his mandatory two-year period of missionary work. This allowed little room for self-indulgences.

New Year honours

Members of the staff on the New Year Honours list included:

Companion of the British Empire

Dr Albert Lloyd George Rees, of North Balwyn, Vic., for service to the science of chemical physics. (Chief, Division of Chemical Physics)

Order of the British Empire

Dr Donald Martin, of Hobart, Tas., for scientific service to the apple industry. (Former Officer-in-Charge of the Tasmanian Regional Laboratory)

Member of the British Empire

John Patrick Brophy, of Floreat Park, WA, for public service to science. (Regional Administrative Officer, Perth)

Miss Jean Athola Conochie, of East Melbourne, Vic., for public service to science. (Principal Librarian, CILES)

Kenneth Archibald Metcalfe, of Lockleys, SA, for public service to defence, science and technology. (Division of Tribophysics)

British Empire Medal

Eric Stanley Smith, of Pascoe Vale South, Vic., for public service in photography. (Senior Technical Officer, Division of Animal Health)

Obituaries

Mr Eric West

The founder of the Division of Irrigation Research, Mr Eric West, has died at Griffith at the age of 81. He was Officer-in-Charge of the Division for 34 years.

A pioneer in his field of agricultural technology, Mr West encouraged and developed a more scientific approach to the problems in this field. For example, he advocated banding of fertilisers in the soil for orchard and field crops, and only recently has this become common practice.

He not only had a brilliant career in agricultural technology and applied science, but he was highly regarded by those who worked with him and under his supervision.

Mrs Wim Pearson

The death occurred recently of Mrs Wim Pearson, a member of the Bovine Tuberculosis Section of the Division of Animal Health, Parkville.

Wim was a highly competent person with a friendly disposition. She had an aptitude for obtaining relevent obscure information, for running a smooth operation, and for bridging the gap between the young and the old, the slow and the impatient, and the calm and the tense.

She came to CSIRO in 1967 having previously worked as a science teacher at Clarendon Presbyterian Ladies College, Ballarat. Prior to that she was a bacteriologist with the Animal Industry Bureau Laboratory in Alice Springs.

Doctorates

Dr Mark Hutton, former Chief of the Division of Tropical Crops and Pastures, was awarded an Honorary Doctorate of Agricultural Science from the University of Queensland.

Sir Ian Wark, former Chief of the Division of Industrial Chemistry and Member of the Executive from 1960 to 1965, was awarded an Honorary Doctorate of Applied Science from the University of Melbourne.

Fellowship award

Dr Robert Adler of the Division of Mathematics and Statistics in Sydney is one of seven Australian scientists awarded a Queen Elizabeth II Fellowship.

The fellowships, which are open to young Australian or British scientists of exceptional promise and proven ability for original research, provide for two years of full-time research in the physical and biological sciences at an Australian university or approved research institution.

Dr Adler will carry out investigations into probability and stochastic processes at the University of New South Wales.

Purchasing scheme

Members of the CSIRO Officers Association are reminded that a purchasing scheme exists through which discounts can be obtained on cash sales at certain firms.

Goods for which discounts apply are—auto parts, tyres, batteries, household goods, clothing, hardware, electrical goods and light fittings.

For further information please contact your group representative who can provide details of where discounts apply.

Watchbird

Is there a message here?

The NSW Government has announced that the Criminal Investigation Branch will move to the Remington Centre in Sydney this year. This means the Sydney RAO will now share the building with:

- the CIB (the people's watchdog)
- the State Ombudsman (the NSW Government watchdog)
- the Federal Ombudsman (the Australian Government watchdog)
- the Defence Department (the Nation's watchdog)
- the State Planning and Environment Commission.

With such company someone has asked: Do we still need our internal auditors?

Secretarial seminar

The seventh secretarial seminar organised by the Staff Development Group was held at the Division of Food Research, North Ryde, from 12-14 December. Attending the seminar were (from left) Julie Scholte, Atmospheric Physics, Muriel Baxter, Fisheries and Oceanography, Melanie Rankine, Horticultural Research, Margaret Crichton, Chemical Engineering, June Byrne, Animal Production, Diana Kirkwood, Tropical Crops and Pastures, Gerda Zietek, Course Manager (Head Office), Don Gwynne, Senior Staff Development Officer (Head Office), Shiela Shannon, RAO Sydney, Olive Bembrick, Fisheries and Oceanography, Pam Garlick, Fuel Geoscience Unit, Doris Evans, Fisheries and Oceanography, Joan Reeve, Textile Physics and Flo Whyte, Mineral Physics.

Urrbrae award

Dr Peter May, Assistant Chief of the Division of Horticultural Research, has received the Urrbrae Memorial Award for 1977 for his contributions to Australian agriculture over the past 10 years in the field of horticulture and viticulture.

The award is offered biennially and consists of an inscribed gold medal and $1000 in cash.

It was established by friends of the Urrbrae Agricultural High School, Adelaide, to commemorate students who gave their lives in World War II.

Dr Peter May

Siroforum

Meal money

Recently I was required to travel to Sydney on urgent CSIRO business, at one hour's notice. Money was provided from petty cash for incidental expenses; I was met at the airport so that my expenses amounted to a taxi fare to Sydney airport and my lunch there, which I managed to take at 3 pm. The receipts for both and the remaining money were returned to petty cash the next day.

I have now been asked to return the amount spent on my lunch since all my travelling fell within normal working hours.

I realise that under CSIRO's Terms and Conditions of Employment I am required to travel inter-State when necessary and I accept those Terms, but I wish to voice my protest at the regulation which states that meal allowances are not paid, when travelling inter-State on CSIRO business, during normal working hours.

In similar circumstances to those described above, an officer may find him or herself under some hardship or discomfort and I feel strongly that the least CSIRO can do is to allow provision for a meal allowance at such times.

Inquiries have shown that my experience is not an isolated one, indeed it is mild compared to some. I feel it is time CSIRO had a closer look at this problem.
David Marshall
Head Office

The 'funnel'

I feel I must comment on the nature and substance of a brief article 'NML "funnel" ' is not appreciated (Coresearch No. 217). The article refers to the works commissioned by CSIRO for the Bradfield Park Laboratory from leading young Australian sculptors.

The writer of the article obviously does not know the meaning of the phrase 'objets d'art'. It is not sufficient to literally translate French and large sculptures are certainly not 'objets d'art'.

CSIRO, on commissioning these works, sought the help of the Public Works Committee of the Visual Arts Board of the Australian Council. I was a member of the Board at that time and know the care with which the exercise was carried out.

I was also delighted that Fred Lehany and his colleagues set about the exercise in such a thoroughly professional way.

The self-appointed critics within the NML who do not like the works would be very upset if a sculptor walked into their laboratory and told them that their research work was of a poor standard. They would be quite entitled to ask the sculptor what his qualifications were that enabled him to make such a value judgment.

May not the sculptor ask the scientist what his qualifications are that permit him to make such a disparaging aesthetic judgment about a work of art?

If such exercises are left to rank amateurs the results are usually appalling kitsch. The suggested logos for CSIRO printed in Coresearch this year indicate what happens when amateurs attempt to do a professional designer's job! 'Render therefore unto Caesar the things that are Caesar's; and unto God the things that are God's'.
J.B. Davenport
Division of Food Research
North Ryde

Cleaning contracts

In the December issue of 'Chemistry in Australia' there is an obituary notice of Dr John A. Mills, a former CSIRO scientist.

Dr Mills died of cancer of the lung and alongside his obituary notice is printed an article 'Cancer in the Chemical Laboratory' which he wrote a short time before his death.

In this article he discusses the hazards of droplet-borne infection and dangerous dusts. The latter are well suited to absorb a wide range of chemicals from the laboratory atmosphere and thus to have their toxic properties enhanced.

Dr Mills was very critical of the methods used to clean laboratories, and recalls that every laboratory he ever worked in was cleaned by sweeping and dusting rather than by vacuum-cleaning.

In recent years there seems to have been a policy to contract out the cleaning of CSIRO buildings to operators whose methods are probably adequate for offices, but when used in laboratories are certainly open to the same objections as those raised by Dr Mills.

Until recently the amount of technical assistance available in CSIRO probably allowed some sort of 'spring cleaning' to be carried out, perhaps once a year, but with the current drastic reduction in the number of TA positions even this is likely to be neglected. Many of us are already the highest paid washersup in the business and are disinclined to add laboratory cleaning to our list of chores.

I have discussed this problem with colleagues and many feel, as I do, that a return to a system whereby cleaning is done by trained staff who are employees of CSIRO is long overdue.

Such cleaning staff would be capable of thoroughly cleaning all laboratories at suitable intervals by arrangement with, and under the supervision of, the research staff involved. In addition, the routine day-to-day cleaning would be more capably carried out.
D.J. Cosgrove
Chairman,
Safety Committee,
Division of Plant Industry,
Canberra

Portrait

A simple ceremony was held at CILES, East Melbourne, in December to mark the hanging of a photographic portrait of the late Miss Betty Doubleday, former Chief Librarian of CSIRO.

The ceremony was attended by a number of her former friends and colleagues now retired, as well as present staff.

Included among the former were Jeannette Dunstone, Stella Gilbert, Ann Forbes, Maude Bridges, Marjorie Simpson, Gwen Pike and Sir Robert Price.

Peter Judge, Peter Dawe, Jean Conochie, Clyde Garrow and Sir Robert Price spoke of Betty's contribution to CSIRO and to the Australian Library and information community. A message from Sir Frederick White was also read to the gathering.

Misdirected

Staff at the Cooper Laboratory have been suffering from stiff necks since the recent completion of the World Parachuting Championships.

The Laboratory scored a number of embarrassed competitors with one in the meteorological station paddock, three in the lucerne experiment and four across the driveway of the O-i-C's residence.

Vern Dawson (right) presents Jack Cavanagh with the 'Vern Urn', a perpetual golf trophy that Vern organised and donated. The third annual winner, Jack had a round of 70, two over par.

Farewell at LUR....

Vern Dawson, the man who has spent much of his career organising the logistics for CSIRO survey teams going off to remote areas of Australia and Papua New Guinea, has retired after 25 years with the Organization.

He joined the Division of Land Use Research as Supply and Transport Officer for the Northern Australian Survey teams. It was up to Vern to arrange for gear, supplies, food, transport and necessary back-up.

Later he transferred to the Papua New Guinea Resource Survey team and had to learn a whole new bag of tricks, including how to walk rather than drive.

One of the stories told about Vern concerns his first survey in PNG.

On the northern Australian survey trips the rule was that all vehicles must return to camp by nightfall. If they didn't the party was assumed lost and searchers were sent out.

Vern didn't know that this rule did not apply in PNG. Sudden heavy rains often caused flooding which made it impossible to return by evening.

On his first day in the field there was just such a rain and he tried to get back through the mud and water.

About 9 pm, his friends realised what might have happened and went to look for him. They found him—up a tree, surrounded by flood water.

.... and at RAO

Over 100 well-wishers and friends gathered to say farewell to Molly Aiken when she retired from the Melbourne Regional Administrative Office in November.

Molly joined CSIRO in 1964 and took over the task of Typist-in-Charge of the Typing Section at 314 Albert Street.

The girls that trained under Molly's experienced eye are indebted to her for the opportunity to learn the 'tricks of the trade'.

To wish Molly a happy retirement and to thank her for her services and friendship, her colleagues presented her with a silver tray and six silver goblets.

Soil scientist visits Australia

Professor Miroslav Kutilek, from the Soil Science Laboratory, Department of Irrigation and Drainage, Czech Technical University, Prague, Czechoslovakia, has been visiting the Division of Environmental Mechanics, Canberra, for six weeks under the Division's Pye Fellowship scheme.

Professor Kutilek is one of the most eminent active East European soil physicists. His major research interests, which closely parallel one of the Division's research programs, concern soil water, particularly solid-liquid interface relationships and the flow of water in swelling and cracking soils.

Professor Kutilek

Science at work

Sirosam, the bionic ram, who managed to match the pace of Australia's fastest artificial inseminator for six days before giving up ewes altogether. He has since been put down because of improper advances to a champion stud ram.

'Coresearch'

'Coresearch' is produced by the Central Communication Unit for CSIRO staff. It is also circulated to some people outside the Organization who have a professional interest in CSIRO activities.
Members are invited to contribute or send suggestions for articles. The deadline for material is normally the first day of the month preceding publication.
Material and queries should be sent to the Editor, Box 225, Dickson, A.C.T. 2602, Tel. 48 4476
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Assistant Editor: Barbara Hartley

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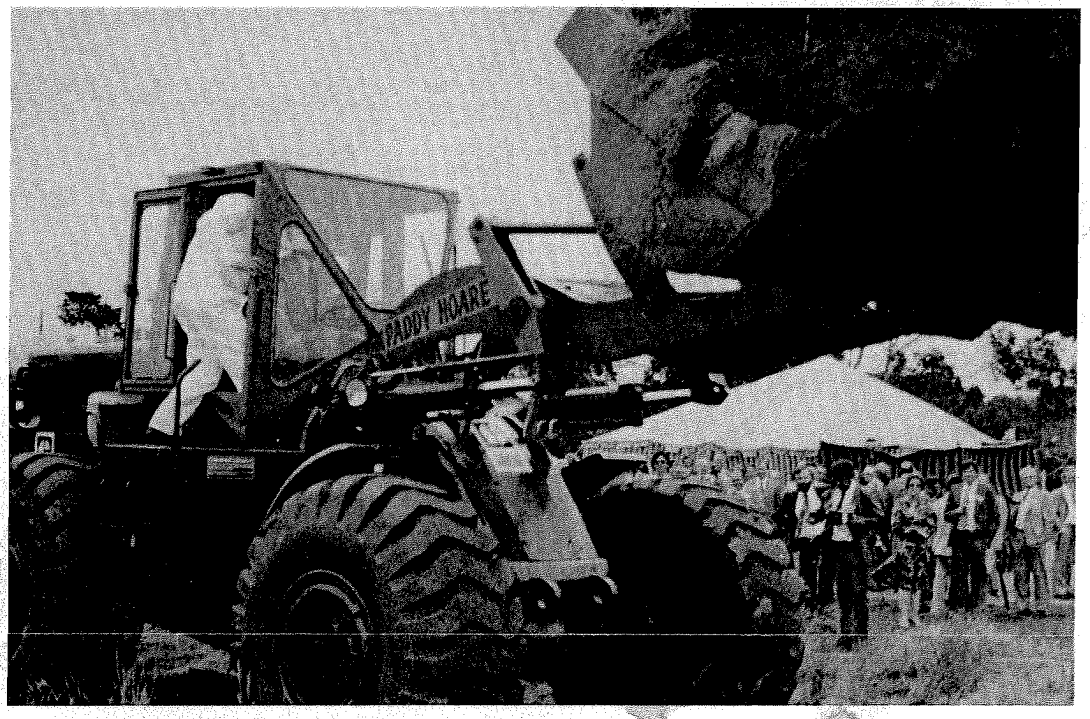


The Prime Minister, Mr Fraser, 'turns the first sod' of the ANAHL project at Geelong.

Work begins on important new CSIRO laboratory at Geelong

The Prime Minister, Mr Fraser, sat at the controls of a front-end loader and took a large scoop of earth out of the ground in an area at Geelong where the old rifle range was once located. With this mechanical method, the Prime Minister 'turned the first sod' and marked the start of site work for what will be CSIRO's biggest building project yet—the Australian National Animal Health Laboratory (ANAHL).

The Laboratory, which will be administered and operated on behalf of the Commonwealth Government by CSIRO is designed to provide a valuable insurance against the devastating effects that the accidental introduction of an exotic livestock disease, such as foot and mouth disease, could have on Australia's animal industries.

Following Government approval for the project in 1974, a large team, including engineers, architects and scientists from the Department of Construction and CSIRO, have been engaged in a period of intensive research and design.

The sight of the Prime Minister digging the front-end loader into the soil was therefore particularly gratifying to the members of the ANAHL team, and to senior officers of the Department of Primary Industry who have been closely associated with the project.

The construction of ANAHL should be complete in about six years. It will then take a further year for testing and commissioning.

ANAHL is expected to cost about $83 million and the Government's decision to spend that much money on the project was, according to Mr Fraser, 'not taken lightly'.

'In providing funds, we were conscious of several major factors', he said, speaking at a function held to mark the occasion.

'Firstly, the dependence Australia has on primary industries for almost half of our export income; secondly, the vulnerable position of livestock industries from the introduction of exotic diseases to Australia.

'If a disease such as foot and mouth were to become established in Australia, apart from the direct costs of eradication measures, the loss in export trade to overseas markets would be close to $50 million a month'.

Mr Fraser said that in building the Geelong facility the Government was taking a major step to minimise such losses.

'Unfortunately, the risks of such diseases entering the country are increasing with greater international movement of people, livestock and livestock products,' he said.

'In recent years, three exotic diseases affecting horses have been detected in Australia.

'Emergency action was required to prevent devastation of the poultry industry by fowl plague and a strain of bluetongue was discovered in northern Australia'.

The Minister for Science, Senator Webster, was also a speaker at the function. The laboratory, he said, was designed to provide a facility for the diagnosis of diseases that managed to penetrate Australian quarantine barriers, to assist in their control and eventual eradication and, most importantly, to allow research into these diseases to be carried out in complete safety.

Former staff for UN posts

Two former CSIRO staff have been appointed to senior positions with the United Nations.

Professor Ralph Slatyer, formerly a senior scientist at the Division of Land Use Research and presently of the Institute of Advanced Studies at ANU, will take up the position as Australia's ambassador to UNESCO after the middle of the year.

Mr Guy Gresford, senior advisor on science, technology and environment to the Department of Foreign Affairs, has been appointed deputy secretary-general of the UN Conference on Science and Technology Development from 3 April. Mr Gresford had been seconded from Head Office to the Department since 1973.

He joined CSIRO in 1942 and was Secretary of the Organization from 1959 to 1966. He was then appointed Director of Science and Technology in the United Nations' Department of Economic and Social Affairs and headed the secretariat of the Advisory Committee on the Application of Science and Technology.

Staff changes at Longpocket Laboratories

Substantial changes have taken place among senior staff at the Long Pocket Laboratories at Indooroopilly in Brisbane.

The Officer-in-Charge (Entomology), Dr R.H. Wharton, has been appointed Officer-in-Charge of the Centre for Animal Research and Development, Bogor, Indonesia, for a period of three years.

The Officer-in-Charge (Animal Health), Mr Peter Durie, has retired.

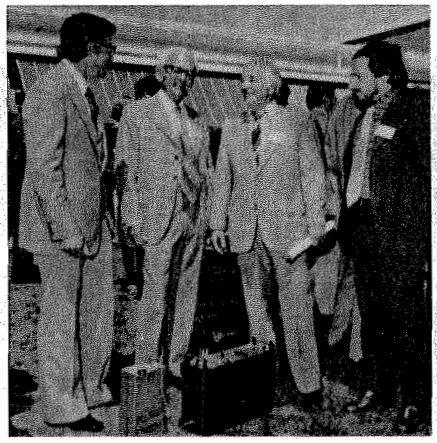
Dr Wharton will transfer to Indonesia in June when Mr A.F. Gurnett-Smith, who has been Officer-in-Charge of P4 for the past two years, returns to Australia.

The position of Chairman, Committee of Management, alternates every two years between Animal Health and Entomology. Under the new arrangements this position will be held by Dr D.F. Mahoney who has been appointed Officer-in-Charge (Animal Health).

Dr J. Nolan is Acting Officer-in-Charge (Entomology) until Dr K.L.S. Harley returns from overseas in May.

Another change involves Mr Stan Carne, Divisional Administrative Officer, who has been seconded to the Centre for Research and Development, Bogor.

This is the way it works—the Minister for Science, Senator J.J. Webster (right) gets a lesson in ore detection with Sirotem from Brian O'Neill, Jock Buselli and the Chief of Mineral Physics, Dr Ken McCracken.



Happiness is a successful joint venture—Brian O'Neill (left) and Jock Buselli (right) share a proud moment with the Chairman of CSIRO, Mr Victor Burgmann and the Managing Director of Geoex, Mr Ed Burnside.

Jock Buselli (left) shows Dr John Nixon, President of AMIRA, the on-site computer print-out from the demonstration.

Ore detector handed over to Australian industry

The Sydney team of scientists who developed Sirotem, an instrument which will detect hidden ore buried beneath the surface of the earth, last month saw the culmination of many months of hard work when they were present at a function to watch the first commercially manufactured model of the instrument handed over to industry.

The men were Dr Ken McCracken, Chief of the Division of Mineral Physics, and his colleagues, Dr Jock Buselli and Mr Brian O'Neill.

The licence to manufacture Sirotem was awarded to the South Australian company, Geoex Pty Ltd which has already had models working in the field in a number of places in Australia.

The first commercial model has been bought by BHP for use in base metal exploration in Australia. The cost of each instrument is $19 000.

The ceremony, held at the Australian Mineral Foundation in Adelaide, was jointly hosted by CSIRO and Geoex, and was attended by representatives of the mining industry from many parts of the country, by State and Federal politicians, and guests from State and Federal Government departments and authorities, and from universities.

The Minister for Science, Senator J.J. Webster, formally handed the instrument over to the BHP representative, Mr R.J.Burge, saying it was 'the best tool of its kind in the world...and a valuable aid for mineral research, both in Australia and overseas.'

Other speakers included the Chairman of CSIRO, Mr Victor Burgmann, the Managing Director of Geoex, Mr Edward Burnside, the President of the Australian Mineral Industries Research Association (AMIRA), Dr John Nixon, and Dr McCracken.

Following the formal part of the function, the guests were able to see how Sirotem would work if it were in the field and had the lawns of the AMF building been hiding any secret resources of uranium, gold or nickel, they would surely have been found under such intensive scrutiny. The Minister was given the opportunity to demonstrate the way the instrument worked.

The technique of TEM

The technique of transient electro magnetics (which is where Sirotem gets its name) has been used in other parts of the world, particularly Canada and Russia, to detect mineral deposits buried under the earth's surface.

Russian-made TEM instruments have been used in Australia but the results were unsatisfactory because unlike other countries, Australia is covered with salty soils.

These soils, known as conductive overburdens, mask the detection of ore bodies and it seemed for a time that TEM would not work usefully in this country.

The scientists at Mineral Physics, however, decided that perhaps the peculiar Australian difficulties could be overcome and set to work to find a way.

The instrument detects the ore bodies by analysing decaying eddy currents within the ore. The unit drives an electric current through a large transmitter loop of wire (up to 100 metres across) which is laid out on the ground. When the current is passed through the loop it creates a magnetic field that extends into the ground below.

When the current is switched off, the magnetic field collapses and in so doing, induces eddy currents of electricity in the ground which then decay within a fraction of a second.

A second receiving loop is used to detect and measure the magnetic fields generated by the eddy currents.

The strength and rate of decay depends on how well the ground conducts electricity. Mineral deposits are usually good conductors, most rocks are not. For this reason TEM instruments can detect orebodies by registering an anomaly in the size of the received transient signal and its decay rate.

By using novel electrical circuitry, the CSIRO research team was able to overcome the problems found with the use of ordinary TEM instruments here.

Then in 1974 microprocessors came on the market, which meant that a 20kg minicomputer could be replaced by a 200g printed circuit card.

This allowed the research team to devise an instrument that is compact in size—it fits into two suitcases—and light in weight—it weighs only 16kg. This makes it ideal for using in outback areas.

The portable unit is simple to operate, produces a printout on the site from its microprocessor, and is far more sensitive than other methods of ore detection.

Geoex is already negotiating other sales of Sirotem in Australia and is hopeful that overseas mining companies will also be in the purchasing queue.

Possum study

Mrs Alice Fitzgerald of the New Zealand DSIR Ecology Division has been awarded an ANZAC Fellowship to study the feeding behaviour of the opossum in its original habitat, Australia.

She will be based with the Division of Wildlife Research, Canberra, and hopes to spend some time working in the Physiology Department at ANU.

As many New Zealand opossums originated from Tasmania, Mrs Fitzgerald will also work with the Tasmania Parks and Wildlife Service.

Appointment

Dr D.J. Gauntlett has been appointed Officer-in-Charge of the Australian Numerical Meteorology Research Centre. He succeeds Mr Reg Clarke who has retired.

Management changes announced

Members and Associate Members of the Executive have been given an increased range of individual responsibilities under new interim management arrangements announced last month.

These changes follow a review by the Executive over the last few months of its methods of working.

Commenting on the new arrangements, the Chairman, Mr Victor Burgmann, said that although the Executive could not predict what decisions the Government might make on the future management structure of the Organization, the changes should prove a helpful step towards longer-term proposals as well as having merit in their own right.

The arrangements include:

- The allocation of additional responsibilities to Members and Associate Members of the Executive towards those Divisions with which they already have a special relationship.
- The work of the Program Committee and the interim Executive meetings will now be handled by two types of Executive meetings—the Executive Committee (Operations), chaired by Mr Burgmann, and the Executive Committee (Policy Development), chaired by Dr A.E. Pierce.
- Each full-time Member and Associate Member of the Executive has been allocated a senior personal assistant to help with the additional responsibilities. These positions have been filled by the five assistant secretaries of the Science Branch. They will continue to retain their other duties as well.

The appointments are:

Executive		SPA
Dr H.W. Worner	-	Dr J.B. Allen
Dr A.E. Pierce	-	Mr A.W. Charles
Dr N.K. Boardman	-	Mr K. Avent
Dr J.P. Wild	-	Mr H.R. Webb
Dr K.A. Ferguson	-	Dr J.R. Yates

The responsibilities of Mr Peter Butler and Mr Paul Grant remain unchanged.

At the same time as these arrangements took effect it was announced that Mr Burgmann and Dr Boardman had agreed to their terms of appointment to the Executive being extended to 24 September. Dr Wild has also agreed to continue serving as an Associate Member of the Executive for the same period.

Pleasing preview

When the Gallery Huntley in Canberra hosted a preview of wildlife paintings by Frank Knight, it was a quietly pleased artist who received the congratulations of guests.

Frank, who is the artist of the Division of Wildlife Research, had good reason for his pleasure... about half of the 34 paintings had been sold before the opening and by the end of the preview, only two remained for sale.

The paintings, which brought forth many favourable comments, were on show for a fortnight.

Since he first began drawing mammals for Divisional publications, Frank has developed a style of painting and drawing wildlife which is refreshingly different from the work of many other artists.

The animals (and that includes birds) are painted with scientific accuracy. As well, Frank goes to considerable trouble to make certain their background is also realistic. Bark, leaves and flowers are collected and painstakingly reproduced so that the animals are seen in natural surroundings.

Frank has already illustrated a number of wildlife books, has designed stamps for the Wildflower series and illustrated the mammal leaflets in the Australian Endangered Species series produced by the Australian National Parks and Wildlife Service.

Students visit scientists at field site

During the recent field survey to Western Australia on which the 'fossil' ant, *Nothomyrmecia macrops* Clark, was rediscovered, the taxonomists from the Division of Entomology's Australian National Insect Collection found themselves in a new role.

While working in the Thomas River area east of Esperance they were asked by Mr Tony Moore, manager of Orleans Farms, if they would give a talk to the pupils of the local Condingup Primary School.

Rather than have some of the team 'go to school' so to speak, Mr Moore asked if the children could visit the campsite in the school bus.

This was agreed to and on the appointed day about 20 children and the head teacher arrived at the site some 30 miles from their school. The weather was fine and hot, a fortunate change from that which had bogged the party down at Mt Ragged a few days earlier.

Don Colless, the dipterist with the ANIC, spoke on the reasons for the taxonomic study of insects and explained what the ANIC was all about.

Murray Upton, the survey leader, discussed the methods used to collect insects, demonstrating the equipment actually being used in the field.

John Feehan, from the Dung Beetle Section, showed how these beetles were trapped and the beneficial effects they have on the pastures.

Following these talks the children, in small groups, were shown through the field laboratory where John Lawrence, the coleopterist with the ANIC, showed them specimens of small beetles being cultured.

The entire collection of insects made by the team was also on display in the laboratory

Judging by the questions asked and the difficulty experienced in getting the last children out of the laboratory they obviously enjoyed their visit.

Students from the Condingup Primary School, SA, enjoy the opportunity to see CSIRO entomologists at work in the field. On the right is Dr John Lawrence and standing next to him is Dr Don Colless.

100 000 people have 'Listened to the Stars'

The number of people who have seen the three-screen audio visual production 'Listening to the Stars' at the Parkes Visitors Centre has now exceeded the 100 000 mark.

The Canberra family that won the honour were given special treatment which included a VIP tour of the radio telescope.

The audio visual presentation is an integral part of the Centre's activities. It was installed in May 1975 at a cost of $34 000 (including equipment).

From the outset the Executive agreed to a charge being made for the theatre. Visitors are also able to buy souvenirs and books about astronomy.

The revenue of the Centre since the opening now exceeds $82 000 of which $39 000 represents entrance fees to the theatre.

Not all visitors see the show, but most who have the time to stay for it, do so (the presentation lasts 27 minutes).

Later this year it is hoped to start installing an impressive new display at the Centre, adding to the attraction it already has for the travelling public.

New FRS

Dr Keith Boardman, a member of the Executive, has been elected a Fellow of the Royal Society of London in recognition of his outstanding contribution in biochemistry.

Industry scores CSIRO walking 'data bank'

The Minerals Research Laboratories have just performed a high level technology transfer to industry. Not a process, an instrument or a patent but the man himself, a walking data bank on fossil fuel energy.

Dr R.A. Durie has left the Division of Process Technology to become Chief Scientist for R.W. Miller (Holdings) Ltd. In his newly created position, he will be advising the company in many areas of its coal interests, including the planning of future mines as well as ensuring high quality production and preparation.

Through personal projects within the company and his membership of several national bodies such as the Institute of Energy, the Institute of Engineers and the Australian Academy of Technological Sciences, Dr Durie will continue his activities in world coal affairs and research.

As leader of the Fuel Chemistry Section in Process Technology, Bob has been one of CSIRO's most-consulted experts on fossil fuels for many years.

Since 1954 he has been involved in most aspects of coal research in the laboratories at North Ryde and in recent years has directed a major part of CSIRO's oil from coal program, and in particular a substantial coal conversion project based on flash pyrolysis.

Dr Bob Durie

Address change

As from 15 March the new postal address of the Dung Beetle Research Unit will be:
Dung Beetle Research Unit,
Private Bag X5,
Lynn East,
Pretoria, 0039, South Africa.

Name changes for two Divisions

The Division of Tribophysics has been renamed and will be known in future as the Division of Materials Science.

The Adelaide branch of the Division has been renamed the Production Technology Laboratory.

It was formerly the SA branch of the Materials Research Laboratory of the Department of Defence and was taken over by CSIRO last year.

The Division of Chemical Engineering has also been renamed and will now be known as the Division of Mineral Engineering.

Lab 'useful' became leader in scientific photography

Eric Smith, the man who is regarded as the father of scientific and technical photography in Australia, has retired.

His last day at work was 13 April, the day he received his BEM from the Governor of Victoria.

Few people can look back over so much of the history of CSIRO, and know they were personally associated with it, as Eric. He not only grew up with much of that history as it was happening but he made a photographic record of it.

Eric joined the Division of Forest Products as a boy of 14 in 1931 when the Division had its headquarters in the stables and kitchens at the back of what was then Head Office at 314 Albert Street, Melbourne.

In those days he was a 'lab useful' but before long he moved into photography. He was to develop those skills to a high degree, setting a pattern and a level of efficiency for every other CSIRO photographer who followed him.

Eric developed a creative touch that was his own, a flawless technical skill and the ability to adapt to any situation. These qualities he combined with perserverance and a systematic attention to detail.

Occasionally when his mind was in a capricious mood he would capture (on film) beautiful girls around the labs, and he produced some of CSIRO's best 'funnies'.

When he turned away briefly from photographing the world of science, he turned to photographing people, the ordinary ones he saw around the back streets of Melbourne, a change from the famous who were also in his gallery.

In 1945, Eric was seconded to the Film Unit and with Stan Evans, then its Officer-in-Charge, visited every Division and Section making films for post-war showing in England.

Eric however, decided that still photography was more to his liking and he returned to Forest Products. In 1948 he transferred to the Division of Building Research while for the last 11 years he has been the photographer at Animal Health.

Eric is also a Fellow and past-President of the Institute of Photographic Technology.

Looking back over 47 years, Eric feels he has been privileged to have spent his life working in research 'among sincere, dedicated and intelligent people and engaging in photography.

'My work in recording, illustrating and publicising the work of the Organization has given me a rare insight into research programs and the minds of research workers, that comes to very few,' he said.

To express the regard they hold for Eric, the Victorian photographers gave him a farewell dinner and the staff of Animal Health said their farewells on the day of his departure.

Eric Smith

US honour

Dr C.H.B. Priestley, Chairman of the Environmental Physics Research Laboratories until his retirement last year, has been elected an Honorary Member of the American Meteorological Society, an honour which is reserved for persons of acknowledged preeminence in the atmospheric sciences.

Address change

CILES Editorial and Publications Service, previously located at 372 Albert Street, has been re-located at 314 Albert Street, East Melbourne, 3002.

Telephone and telex remain unchanged at (03) 419 1333 and 30236 respectively.

Fisheries scientist works on krill research in Antartic

The resources of the Antarctica and how best they should be managed is a subject close to the heart of David Tranter (right) of the Division of Fisheries and Oceanography.

He has recently returned from a two-month cruise in the southern waters on board the research vessel *Walther Herwig* as a guest of the West German Government.

The vessel is a stern trawler of about 80 m, fitted out for both fisheries and oceanographic research and is similar in design to that proposed for CSIRO in recent years.

The *Walther Herwig* carries a party of about 42 equally made up of scientists, officers, fishermen-sailors and service personnel.

It is capable of midwater trawling for krill and bottom trawling for ground-fish and has machinery on board for processing fish into fillets and fish meal.

On David's cruise, newly installed machinery was used to produce protein-rich krill-meal using driers adapted from those designed for producing powdered milk.

Accompanying the *Walther Herwig* was the *Julius Foch*, a commercial trawler under charter to the German Government.

The expedition left Buenos Aires in Argentina and returned to Ushuaia in Tierra del Fuego, the main area of exploration being the waters around the Antarctic Peninsula, Scotia Sea and South Georgia.

For a great part of the time the ship worked on the edge of the pack ice and in the iceberg zone. Just south of South Georgia an iceberg 64 km long by 40 km wide was encountered heading for South Georgia—it could well be the largest iceberg in the world at the present time.

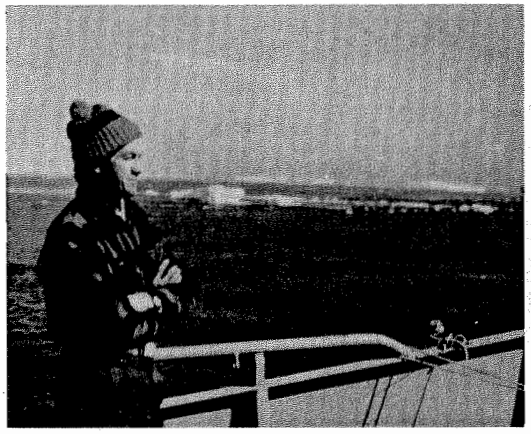
The research on board was centred on the biology of the Antarctic krill *Euphausia superba*. This is a small planktonic shrimp present throughout Antarctic waters but concentrated in enormous numbers in certain areas such as the Scotia Sea. The *Julius Foch* could take 10 tonne of krill in a single haul, more or less at will, using echosounders to locate the swarms.

The *Walther Herwig* used the 'Multisonde' to profile temperature and salinity with depth, an *in situ* fluorometer to gain an indirect measure of the abundance of phytoplankton (depending on their physiological state), arrays of water bottles to collect stratified water samples for chlorophyll analyses and measurements of primary production, and a range of plankton nets, in addition to the large trawl nets for midwater and bottom trawling.

David's observations revealed a 10-fold difference between 'new water' at the ice-edge, that is, ice which has just melted, and 'old water' some miles away. Rich zones of phytoplankton were discovered to the south of South Georgia and west of Graham Land.

During the course of the cruise, the ship visited the British research station on South Georgia, the American station at Palmer on the Antarctic Peninsula, and the Argentine bases of Esperanza and Porto Cove.

These countries are participating in the international scientific research program BIOMASS which runs for 10 years from 1978 to 1988. It is centred about the biology of krill which appears to be the key organism in Antarctic ecology, the food for a variety of whales, seals, fish, squid, penguins and other birds.



David Tranter on board *Walther Herwig* in the Weddell Sea

Outside this cruise made by David, CSIRO has little involvement in Antarctic oceanography.

However, the Antarctic Division of the Department of Science is planning to expand its activities into the field of marine biology and David and Dr Graham Chittleborough of the Division of Fisheries and Oceanography are members of the Australian National Committee for Antarctic Research (ANCAR) Biology Sub-Committee.

TA President dies suddenly

Mal Franklin, President of the CSIRO Technical Association for the past four years died suddenly last month aged 31.

Mal had been with the Division of Food Research since 1966. He worked in the Plant Physiology group and was particularly interested in developing techniques to detect and measure plant hormones.

Shortly before he died Mal spent some months in the Phillipines helping Dr Barry McGlasson set up a laboratory and train people in specialised techniques related to tomato research.

His election as the youngest President of the Technical Association clearly showed his leadership qualities.

A measure of Mal's character was that throughout the time of his presidency he knew he had Hodgkin's disease.

For all that, he chose to lead the Association through some difficult years and developed it into one of the liveliest of the staff groups.

He will be well remembered for his efforts in what became known as the 'Connor affair' when the Organization was threatened with the loss of some of its Divisions.

Mal was unassuming to talk to, but he had a gift of quietly determined leadership. He had a love for science, and what CSIRO stood for. That came first.

Mal left behind a wife, Rhonda and two children and to them, CSIRO has extended its sympathy.

Secretary farewelled

Friends at Head Office gathered to say farewell to Sue Hanmore, secretary to the Chairman, Mr Victor Burgmann. She has been with the Organization for seven years and was also Sir Robert Price's secretary.

Helen Barry has now taken over Sue's responsibilities.

Women to meet

The fifth International Conference of Women Engineers and Scientists will be held in Rouen, France, from 4-8 September. The theme of the Conference is 'Technology and Freedom'.

Interested CSIRO staff members may obtain application forms from the following address: Cinquieme Congres des Femmes Ingenieurs et Scientifiques, Association Francaise des Femmes Diplomees des Universites, 4 rue Chevreuse, 75006 Paris, France.

'Our man in Moscow' speaks of Russian attitudes to science

The value of a Government interested in science and the acceptance of a minimum five-year planning period for its national economic project in which science and technology play a major role were two useful lessons Australia could learn from science in the USSR.

The negative lessons to be learnt were not to get too bureaucratic, centralised or authoritarian.

These pluses and minuses for science under the Soviet system were outlined in Canberra last month by Mr J.G. Downes, Australia's Scientific Counsellor at the Embassy in Moscow.

In a talk to CSIRO staff in Canberra during a return visit to Australia Mr Downes explained the massive effort put into research and development in the USSR.

He said science and technology were regarded as key ingredients in the country's national development plan.

Currently there were 1.3 million professional scientists in the Soviet Union, not including such workers as engineers and technologists. If these categories were included there was a massive number of almost four million science-orientated workers.

If Australia was to gain a relative position per head of population it would need 70 000 to 80 000 professional scientists.

Between two per cent and three per cent of the USSR's gross national product went to scientific research and development—including defence research, Mr Downes said.

This cost 20 billion roubles a year. On a comparative scale this would come down to $A1 billion per year.

'There is great populat interest in science and technology in the country,' Mr Downes said.

'Posters in the street proclaim praise for the work done by scientists, and one popular scientific magazine has a print run of five million.'

Mr Downes said science had, in many respects, made the USSR a super power. It led the world in the production of coal, was a leading oil and steel producer, and the world's biggest cotton grower and grain producer.

Health standards were high, life expectancy had increased markedly, education was compulsory, the people were adequately dressed, and no-one was starving.

'In fact, they can claim the achievement of an economic miracle,' he said.

'However, there are still many shortcomings.

'They are behind the West in the consumer goods and service areas and despite intensive planning there are an extraordinary number of production bottlenecks.'

Scientific performance was patchy with brilliant achievements in some areas and mediocre results in others.

Mr Downes said he believed the authoritarianism of the State produced a lack of initiative, a difficulty in getting new ideas into production, and reluctance to take responsibility.

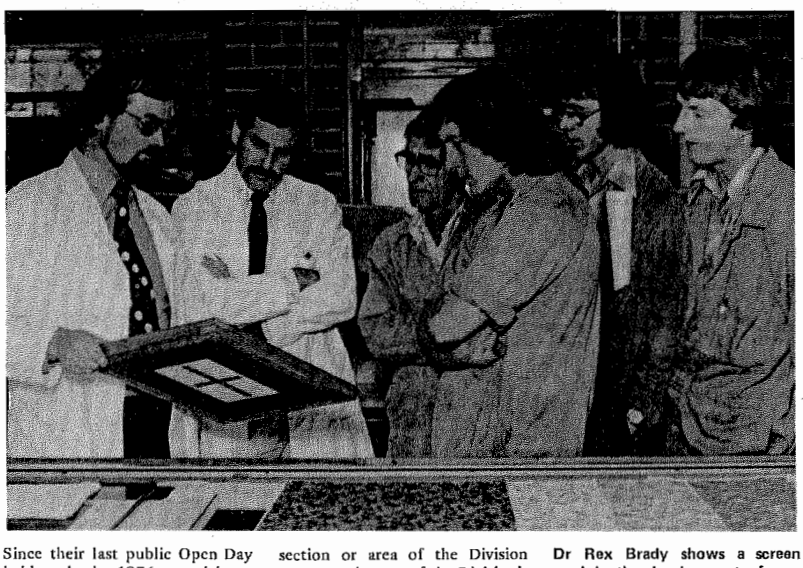
Conference

The third Annual Conference of the Australian Radiation Protection Society will be held in Sydney 24-26 May at the University of Sydney.

The scientific program will include both review and technical papers covering a range of radiation safety topics.

For further information and offers of papers please contact Mr A.P. Cardew, Radiation Branch, PO Box 163, Lidcombe, NSW 2141.

Staff open day at Geelong



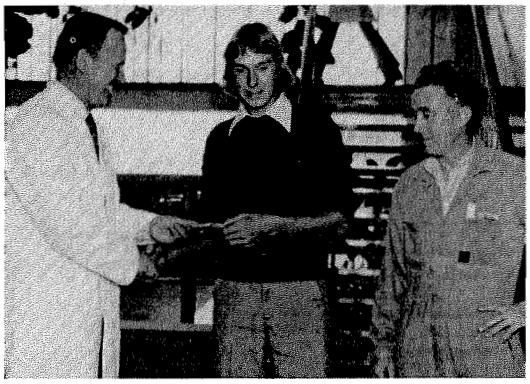
Dr Rex Brady shows a screen used in the development of new printing techniques for wool to (left to right) Barry Hirst, Don McLaws, Peter Eastgate, Steve Cotton and Jeff Baum.

Since their last public Open Day held early in 1976 to celebrate the Jubilee, the Division of Textile Industry, Geelong, has organised a number of mini-open days for the benefit of staff only.

Every two or three months, a section or area of the Division opens to the rest of the Division's staff to show and explain its research and/or service activities.

The latest day was held in December, when the Division's dyeing, printing and finishing section was open to viewing.

He's the top apprentice



Greg Mulder (centre), formerly of the Division of Textile Industry, Geelong, has been awarded the 1976 Arthur Frost Memorial Award.

The $100 award is made annually to the apprentice trained by the Organization who is judged to have achieved the most significant improvement in overall performance in the final year of his apprenticeship.

Greg left the Organization on finishing his apprenticeship and is now working in Dampier, WA but returned to Geelong for the presentation. This was made by the Chief of the Division, Dr Don Taylor (left), on behalf of the President of the Laboratory Craftsmen Association, David Alexander.

On the right is Di Williams, the Geelong Divisional Representative of the Laboratory Craftsmen Association.

LRM and ABC produce documentary on WA

The Division of Land Resources Management in Perth is soon to take to the nation's electronic media. It has co-produced a 50-minute environmental documentary in collaboration with the ABC and the Western Australian Environmental Protection Authority.

The documentary is scheduled for screening on 16 May in NSW, ACT and SA, 24 May in WA, and 30 May in NT, Qld., Vic., and Tas.

The script, written by Robin Juniper of the ABC and Justin Murphy of LRM's Communications Unit, was directed by Jeni Kendall and produced by Craig Collie, both from the ABC in Sydney.

It will concentrate on the major environmental issues in the region known as 'System 6'—an area of the south-west which extends from the Moore River (north of Perth) to around Busselton in the south and runs inland to the forested Darling Range.

System 6 is of particular interest because the vast majority of Western Australia's one million people live there and consequently many of the major environmental issues and problems occur there—problems like stream and groundwater salinity, jarrah dieback, urban waste disposal and wetland management.

DBR has advice for home handyman

With a bewildering array of ceramic or clay based tiles on the market, the home handyman's biggest problem is to decide which tile matches the use he has in mind for it.

And, according to the Division of Building Research, making that choice is where many homeowners make mistakes.

Mr Max Murray of the Division's Ceramics Section in Melbourne says that too many people choose tiles on appearance rather than on their ability to do the job expected of them.

'For example, earthenware tiles are simply not suitable for very heavy duty paving, for outside or for very wet areas although they are quite suitable for internal walls if they carry a quarantee against crazing,' he said.

'Our investigations indicate that too often the choice of tiles is based on how they look and what they cost, and performance data are ignored.

'It is inevitable that failures will occur, even though they may take some years to become evident.'

Mr Murray suggests that homeowners considering buying ceramic tiles should follow this guide:

- Low risk areas—in dining rooms, bedrooms and other areas which are not exposed to moisture or heavy traffic, glazed and decorated earthenware tiles and glazed quarry tiles are suitable.
- Medium risk areas—in kitchens, rumpus rooms and other areas subjected to heavy traffic, use earthenware tiles if they are laid on a concrete floor, but use either glazed or unglazed stoneware or quarry tiles if the floor is wood.
- High risk areas—in laundries, shower recess floors, outside patios and verandahs where tiles are exposed to excessive moisture (including the weather), the use of stoneware and good grade quarry tiles is recommended.

Mr Murray warns however, that strong detergents, sugary liquids and fruit juices can cause rapid deterioration of the grouting between tiles.

Divisional 'review' at Chemical Technology

When you talk about Divisional reviews at Chemical Technology, you need to make quite sure that everyone is on the same wavelength. The phrase 'Divisional review' can apparently have two meaning if this picture proves anything.

This review, staged by the staff, was appropriately known as 'Don's Party'. It's a bit difficult to tell who got their gear on and who got it off, but the staff sang their way through the most successful show the Division has yet produced. Even Fifi D'Amour, the message parlour girl, put new pin-ups round her message board for the occasion.

New publication will be guide for special events

When Divisions, RAOs or Head Office staff are confronted at some time in the future with the task of planning the opening of a new laboratory, holding open days, staging a conference, symposium or seminar, or organising a field day or some other special function, they soon will no longer have to say: 'But where do we start?'

Last year an ad hoc working party was set up to produce a guidelines publication to cover just that question. It is now in the process of being edited and hopefully it will be printed and distributed later this year.

The publication will give helpful suggestions on many aspects of such projects, from the initial stages of planning an event, the protocol it may involve if Ministers and other politicians are invited, catering, preparing exhibits and manning them, the complete how-to-organise-a-conference, a suggested timetable for the preparation of participating in a metropolitan or country show, suggested security arrangements, and a whole host of other ideas.

Much of it has been planned as a check list, starting with ideas on choosing the day. No one is recommending that a horoscope be consulted for the choice of an auspicious occasion, but when VIPs are to be invited, there are calendars and programs which can be consulted to see if there is at least a chance that they might be available.

Each section of the publication has been prepared by different members of the working party but the members don't regard it as the complete bible for such functions.

They believe it will be the starting point—and a good deal more—for such events but those using it can later add their own particular requirements to it since all areas differ at least slightly.

By making it a loose-leaf publication, Divisions and Offices can add their own notes to it as recommendations for future events they might stage.

The working party has as its chairman, Dr Brian Stacy, Assistant Chief, Division of Animal Production. The members are: Stan Boston (Textile Industry), Dorothy Braxton (CCU), Bob Couper (Building Research), Peter Thompson (Tropical Crops and Pastures) and Maurie Woodward (Land Resources Management). Mr George Williams, Manager of the Central Communication Unit, has also been closely involved with the group.

When the working party has been together it has taken the opportunity to meet other people in the area involved in communication work within CSIRO and it was out of those discussions that the idea grew of setting up the wider Communication Resources Coordinating Group (see page 7).

Can you help?

There is a small but steady demand for sets of the 'CSIRO Author Index', published in 14 blue paper-bound volumes between 1964 and 1967, which is now completely out of print. At least two copies are needed urgently.

Spare sets would be gratefully received by the Chief Librarian, 314 Albert Street, East Melbourne, Vic. 3002.

Social activities

The 'newly reformed' 314 Social Club at CILES has been enjoying a busy round of social activities—ethnic dinners, film screenings, after-work get-togethers and raffles.

The latest happening was a 'Bushwackers Night' with an all-Australian flavour of roast meat, bush band and an early Australian feature film.

Guests mixed in an authentic atmosphere of gum leaves and hurricane lamps.

T-shirts for Melbourne Division

Staff from the Division of Chemical Technology, Melbourne, proudly display the Division's new T-shirt. Mrs Margaret Skukies won the competition held to find a suitable design. It features a test tube with bubbles in the form of the Southern Cross with the words CSIRO and Chem. Tech. prominently displayed. The Division has sold about 100 of the T-shirts to date.

CSIRO says goodbye to more retiring members of staff

Mr Alan Patterson, the Regional Administrative Officer, Melbourne, has retired after having given more than 44 years service to CSIRO and its predecessor—CSIR.

Alan began his career as a temporary messenger in the Head Office of CSIR at 314 Albert Street, East Melbourne, in December 1933.

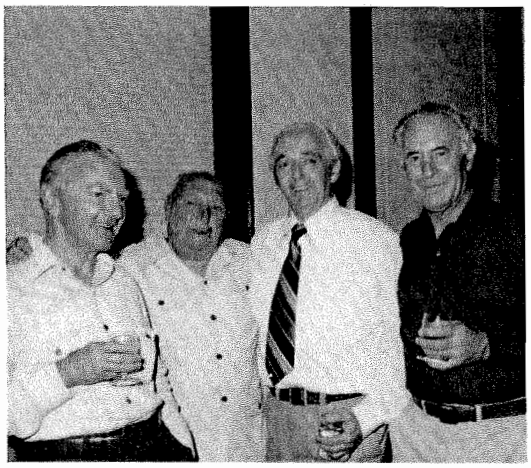
Later he served for a number of years as Divisional Clerk at the Division of Industrial Chemistry at Fishermen's Bend, and subsequently he moved to the National Standards Laboratory in Sydney.

A few years later he returned to Head Office in East Melbourne and when the RAO was established in 1963, he was appointed as the first Regional Administrative Officer.

Alan was keenly interested in the welfare of the staff, and he was a Director of the CSIRO Co-operative Credit Society from 1965 to 1976.

A farewell function for him was attended by more than 100 fellow officers and friends from various offices and laboratories. All paid tributes to his contribution to the development of CSIRO, and to the friendships he made during his long career.

Alan plans to spend some time fishing and relaxing by a particular river in East Gippsland. He also intends to travel overseas again with his wife, Ronnie.



Some of the 'oldies' of the CSIRO family turned out to help Alan Patterson celebrate his retirement—from left: Ray Viney, Jeff Foley, Alan Patterson and Ray McVilley.

Colourful career

Long Pocket staff held a barbecue to say farewell to Dr Durie who was a member of CSIRO for 31 years.

His career was a colourful one. After graduating from university, he served with the Army, the Munitions Department and the Air Force. He claims the time spent supervising 200 women munitions workers was the most dangerous of his wartime service.

In 1946 he received CSIRO's first Ian McMaster scholarship while later his research work was recognised when he was elected as a Fellow of the Australian Society for Parasitology.

Dr Durie was appointed Officer-in-Charge of the Animal Health group in Queensland in 1967.

He has always been a builder at heart, and supervised the construction of the excellent laboratory and animal accommodation facilities which Animal Health enjoys at Long Pocket. Due largely to his drive, the sophisticated insect-proof accommodation for cattle at Indooroopilly was completed just in time to meet the challenge posed by the Division's recent isolation of bluetongue virus in Australia.

Cattle are productive creatures in more ways than one, and Dr Durie gained some notoriety in select circles by constructing the 'Durie Faecal Disposal Unit' at Long Pocket, an essential laboratory facility, known there by a pithier apellation.

However, it is for his warm and friendly personality that he will be remembered best. Scientists are not easy people to administer and the harmony which has prevailed among his staff was due to his wisdom, tolerance and sense of humour.

Only briefly

Norman Sanders, Scientific Assistant to the Chief at the Division of Animal Health for 14 years, has had one of the shortest retirements in CSIRO.

Leaving the Organization in September he was reengaged within a few weeks to write a special report for the Executive and the Minister for Science, Senator J.J. Webster, concerning the bluetongue crisis.

Norman graduated Bachelor of Veterinary Science, University of Sydney, in 1936 and after two post-graduate years working with the Australian Wool Board, joined the Colonial Veterinary Service, Department of Agriculture, Fiji in 1939 and remained there until transferred to the Department of Veterinary Services and Animal Industry, Uganda, East Africa, in 1948.

He retired as Director of Veterinary Services and returned to Australia at the end of 1963.

Norman was farewelled by his colleagues at functions in both Sydney and Melbourne. He recently built a home at Saratoga near Gosford, NSW, and when he finally has the opportunity to retire he plans to pursue his two most favoured hobbies, gardening and fishing.

'Temporary' clerk

Keith Wenham, DAO at the Division of Applied Geomechanics, has retired after 31 years of service with the Organization.

He joined the then CSIR in 1946 as a temporary clerk in the records section.

In 1958 he transferred to the Soil Mechanics Section of the Division of Soils and when the Section gained independence shortly after, he became its first Administrative Officer.

During the following 19 years Keith saw the Section become the Division of Applied Geomechanics and its staff grow from four to 101.

Keith was a strong supporter of credit societies in CSIRO.

He was also a foundation member of the CSIRO Benevolent Fund in Victoria and retained that position until his retirement.

Keith will be remembered for the warm relationships he established with all members of the Organization that he worked with and for the wise council and guidance given in his administrative capacity.

Solar engineer

Bob Dunkle, Chief Research Scientist at the Division of Mechanical Engineering, retired in December. He joined the Division, then the Engineering Section, in 1959.

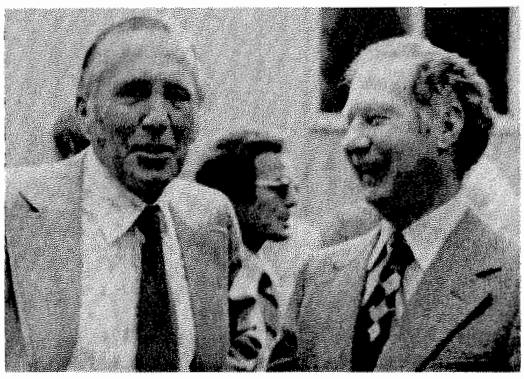
Bob came to Australia from California, where he had been Associate Professor of Mechanical Engineering at the University of California at Berkeley.

While he was with CSIRO, Bob led the Solar Energy Utilisation and later the Heat and Mass Transfer Groups in the Division.

Now, on retirement, Bob is farming nuts at his Gembrook property and continuing attempts to reduce his golf handicap.

He is also an Honorary Research Fellow at the Division, and from time to time he visits Highett maintaining his interest in the research activities there.

Peter Durie and his wife Betty enjoy a joke with a group of friends at his farewell barbecue.



Keith Wenham and the then Chief of the Division of Applied Geomechanics, Dr G.K. Aitchison, share a laugh at the Division's farewell to Keith.

Bob Dunkle (left) and his wife, Margaret, talk with Dr Barry Rawlings, Chief of the Division, at Bob's farewell.

Bushfire book is published

A new book entitled 'Bushfires in Australia' has just been published by the Australian Government Publishing Service for the Forestry and Timber Bureau and the CSIRO Division of Forest Research.

It deals with the many facets of fire control and fire behaviour in Australia and has been written particularly for volunteer bushfire brigade members.

It is also seen as being useful to any person who resides in an area which is likely to be affected by bushfires.

The authors are Harry Luke and Alan McArthur. Alan, with the Division of Forest Research, is perhaps best known for designing the forest and grassland fire danger meters, the basis for most fire danger ratings throughout Australia.

The book brings together detailed and practical information on fire control and fire behaviour.

It includes a full chapter on safety and survival that is of vital interest to all readers.

Picture: Co-authors Harry Luke (right) and Alan McArthur sign a presentation copy of their new book 'Bushfires in Australia' at a book launching.

Winners

The Division of Forest Research recorded another achievement last month—its 'Allstars' football team won the ACT 2nd Division Touch Rugby Competition for 1978 (Walter Burley Griffin Shield).

High flying staff make solid touch downs

Two members of CSIRO's staff have been involved in aircraft accidents in recent weeks and both have survived to tell their stories.

The men were Brian Leaver, a member of the Internal Audit Group at Head Office in Canberra, and Derek Staples, of the research staff of the Division of Fisheries and Oceanography located at Cleveland.

Brian escaped serious injury when he crash-landed his Piper Cherokee after a mid-air collision during formation exercises north-west of Canberra.

A member of Canberra Aero Club's formation flying team, he was training for this year's national championship competition which was to be held mid-March.

As Brian told his story: 'I was flying as No 3 in a three-ship V formation. I broke off during a slow steep left turn and then, while I was searching above the horizon over my right shoulder for my leader (No 1), I made an unexpected spectacular rejoin. It ended with my ramming him under his right wing.

'Pieces of aircraft hurtled out of a cloud of dust, No 1 bounced forward, pitched up and turned through 180 degrees to pass under No 2 in a spin.'

Brian's cabin roof was crushed to seat level behind the pilot's seat, and the left engine mounts, a magneto, ignition harness, fuel line and oil line were cut away.

Both pilots made successful emergency landings despite the damage to their aircraft.

Brian, who walked away from the crash with only a headache, tends to agree with one of his instructors who later made the laconic comment: 'You were lucky, buddy.'

The third pilot radioed the control tower at Canberra airport to summon the emergency services but little assistance from the ambulance teams was needed, the other pilot escaping with only a cut forehead and a sprained ankle.

Undaunted by the experience, Brian took part in the Canberra Week's Air Show last month when he piloted one of the two planes used by the Canberra Sky Divers for their formation display.

Derek Staples was not as lucky as Brian and was badly injured when the amphibian plane in which he was a passenger crashed in thick bush soon after take-off from Weipa, on the eastern coast of the Gulf of Carpenteria.

The plane was on a charter flight for the Division of Fisheries and Oceanography's prawn sampling survey in the region's remote rivers.

It appears that the plane lost engine power soon after leaving Weipa. The pilot was able to bring it down to tree level before hitting the trees and somersaulting engine first into the ground.

Derek managed to push himself clear of the wreckage with his uninjured leg but was then pinned down among some branches and lay in the tropical sun for five hours before rescue. The pilot was also severely injured.

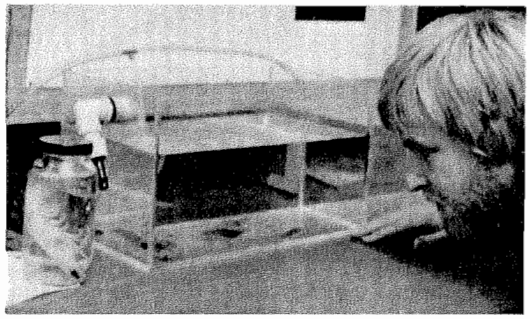
A routine search was started when the plane failed to return to Weipa at the scheduled time.

Just as two young people driving along a nearby road saw the wreckage a search plane flew overhead and spotted it.

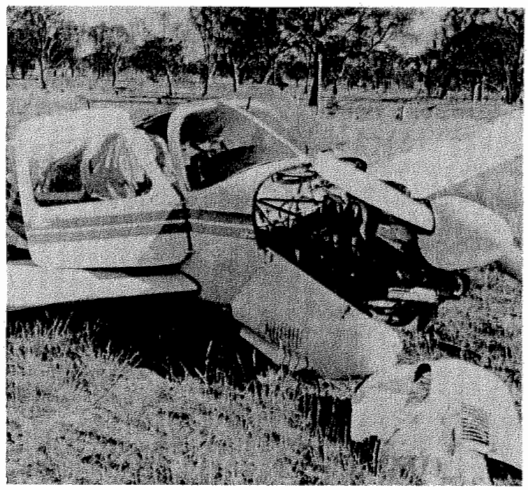
Derek and the pilot were taken by air ambulance to Cairns Hospital after being treated at Weipa Hospital.

The pilot is now all right and Derek is up on crutches after being critically ill for eight days.

His wife Judith was flown to Cairns to be with him while he was in the intensive care unit.



Derek Staples—happier in his laboratory.



Brian Leaver walked away from this mess.

Obituary

Mr Jock Hebron

The death occurred recently of Mr Jack (Jock) Hebron, a member of the maintenance staff of the Division of Chemical Technology, Melbourne.

Jock started duty with CSIRO in 1947 as a sheetmetal worker; later he became supervisor of sheetmetal and associated works.

Jock was recognised as having assisted with and contributed greatly to projects throughout the Division during his 30 years with CSIRO.

Most staff would have had cause, at one time or another, to thank him for his assistance and for his friendship.

Communication resources to be built on

In an effort to maximise the uses of the communication resources available within CSIRO, particularly for shows, exhibitions, visitors centres, and open days, the Executive has set up a Communications Resources Coordinating Group.

The group consists of 11 members drawn from Divisions, Head Office and the Brisbane RAO who have an interest and involvement in the preparation of displays and exhibitions.

While they by no means include everyone in the Organization who could contribute information and assistance in this work, they represent a range of staff from all States except Tasmania.

All have been involved with the organisation of such events, most have had considerable experience in 'crowd handling' and they are all familiar with a wide range of CSIRO activities.

The members are: George Williams, chairman (Manager, Central Communication Unit), Robin Austin (Fisheries and Oceanography), Stan Boston (Textile Industry), Dorothy Braxton (CCU), Bob Couper (Building Research), Anne Frodsham (Horticultural Research), Jenny North (Process Technology), Wendy Parsons (Forest Research), David Thomas (RAO, Brisbane), Peter Thompson (Tropical Crops and Pastures) and Maurie Woodward (Land Resources Management).

The recommendation to establish the group grew out of a meeting of an ad hoc working party which has been preparing a guideline publication for Offices and Divisions which plan to hold open days, open new laboratories, participate in shows or establish visitors centres.

Members of the working party felt that no one communication unit or information section had the staff and financial resources to easily cope with the presentation of a major display in a fully professional manner. Yet there existed considerable experience and knowledge within the Organization if this could only be coordinated.

At its first meeting in Geelong at Textile Industry, the group decided its initial assignment would be to make an inventory of what display material is available for loan in CSIRO, the size of the display and its nature, and what plans Divisions and Offices have for participation in events during the next two years.

The group will have a special interest in any corporate components of displays and will be asking what is planned along those lines when it makes the inventory.

It will also be looking at handout material, give-aways and so on in an effort to make the widest use of anything that is produced for any one particular event.

Officers-in-Charge of Adelaide laboratory change over

There has been a change of Officers-in-Charge at the Production Technology Laboratory in Adelaide. The laboratory is now part of the Division of Materials Science, more familiarly known as the old Division of Tribophysics.

Mr John McNeil proceeded on sick leave in February, prior to his retirement later in 1978. He has been replaced by Dr Colin Perrott, a member of the Division's staff in Melbourne.

John first went to the laboratory in 1947 when it was the South Australian branch of the Materials Research Laboratories of the Department of Defence.

Over the years he guided it through a dual role—that of serving defence needs and the vital part it played in giving assistance to industry in the State, especially in the early years when manufacturers in South Australia were trying to resume peacetime activities.

Colin, who expects to move with his family to Adelaide in a few weeks, was the holder of CSIRO studentships for both under-graduate and post-graduate studies.

His thesis was concerned with the thermodynamic properties of ionic solids.

On moving to the Division of Physics at the National Research Council of Canada in 1969, he switched his interest to the electronic properties of metals at low temperatures.

Another change of emphasis occurred when Colin joined Tribophysics in 1971. Since then he has been concerned with the utilisation and optimisation of materials used in mining and processing industries—mainly involving the control of wear and failure.

His recent research papers deal with various aspects of welding, ferrous casting, tooling for mechanical excavation of rock and economic theory.

Retiring Officer-in-Charge, John McNeil (right), welcomes incoming Officer-in-Charge, Colin Perrott, to the Production Technology Laboratory in Adelaide.

Awards

The services of two CSIRO staff were recognised in the recent Australia Day Awards.

Officers in the General Division of the Order of Australia—AO

Frederick John Lehany, Hunters Hill, NSW, science and industry. (Director, NML)

Michael Vincent Tracey, Gordon, NSW, science, research. (Chief, Division of Food Research).

Poetry prize

Frank McMahon, Head Office, Canberra, won the John Shaw Neilson Poetry Award, one of a number of awards announced by the Victorian Fellowship of Australian Writers. His poem 'Late Getting Home', won the award and his 'If I Could Write' was commended.

Siroforum

The 'funnel'

I am grateful to J.B. Davenport (Coresearch No. 219) for his reply to the criticism of the sculptures commissioned for the new NML site at Bradfield Park.

In questioning the ability of scientists to criticise works of art, he counsels us to 'render unto Caesar...' etc., but does not make it clear who is Caesar and who is God in this case.

The bestowal of the 'Funnel' upon NML certainly resembles the act of a vengeful god upon this uncomprehending flock. Would some prophet kindly enlighten our ignorance as to the hidden message?

John Macfarlane,
NML,
Bradfield Park, NSW

★ ★

I am aware that a great deal has been said and written about the 'Funnel' but I feel compelled to reply to Mr Davenport's letter.

It is to his credit that he is prepared to defend his selection of 'art works' for the NML laboratories but the fact remains that the majority of NML employees do not want what can only be described as the ultimate in obscenity.

Despite the opposition to its installation it would appear that we are still going to have it forced upon us, presumably because Mr Davenport and his friends have decided that they know best what we should like.

True, if the exercise had been left to the members of NML the result might have been regarded as 'appalling kitsch' by Mr Davenport but at least it would have been self-inflicted and might have turned out to be less offensive than the piece of visual pollution that is being inflicted on us.

'Tender unto Caesar that which is Caesar's and to Davenport that which is Davenport's.' If Mr Davenport will send his address I feel sure that I will be able to raise sufficient funds from NML employees to pay for the transport of this load of scrap iron to his home where he can set it up in his back garden and spend all his spare time appreciating it, that is, until the neighbours complain.

The most we can hope for is that the perpetrators of this act of desecration will be permanently recorded on a plaque firmly fixed to this monument to their bad taste so that future generations will know who to blame.

P.W. Smart,
NML

★ ★

J.B. Davenport (Coresearch No. 219) suggests that NML staff who express reserve about the 'Funnel' are behaving as improperly as a sculptor would be who disparaged the work of NML. Surely the two cases are incompatible.

Suppose the sculptor said: 'If you do this instead of that, you'll greatly improve the precision of your measurements'.

The point is, not that this advice may be resented, but that in principle it can be tested to the satisfaction of both parties.

Eventually, one of them will have to admit that the other is right.

Would the reverse situation permit this happy outcome?

I may be wrong, but a feature of many modern works of art is the apparent irrelevance of standards of excellence. Some serious modern music sounds like noise that anybody could invent and make, and so on.

In 'The Two Cultures', C.P. Snow said of contemporary literature, comparing it to science: 'It hasn't the same automatic corrective, and so its misguided periods are longer'.

Might this not describe the other contemporary arts as well?

'Funnel' may well be a lasting work of art, but the NML attitude towards it (perhaps described best as good-humoured resignation) must be expected when people, working in a field where skill can be sharply distinguished from its opposite, view the product of a different field where the distinction often appears (perhaps unjustly) to be blurred.

R.B. Frenkel,
NML

★ ★

As one who is puzzled by much modern art and has made desultory but unavailing attempts to understand it, I was interested in Mr Davenport's perfervid defence of the NML 'funnel' (Coresearch 219).

He suggested that a non-artist is no more entitled to pass judgment on a work of art than is a non-scientist to judge science.

A good try, but it won't do! Nowadays a publicly-funded scientist is expected to be able to explain in layman's terms the objectives of his research, and how it will contribute to the advancement of science or the solution of a problem.

Is it not reasonable similarly to ask an artist whose works the taxpayer is funding why his work is good and what it contributes to art?

I don't think I am totally insensitive to the visual arts.

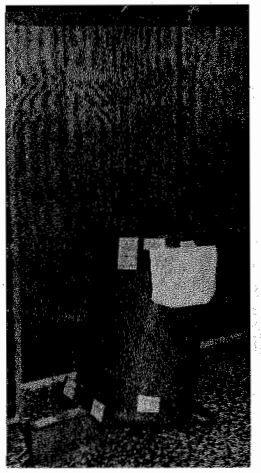
On several visits to Rome I have never failed to visit the Church of San Pietro in Vincoli just to admire again Michelangelo's 'Moses', and his Pieta in St. Peter's is tremendously moving.

My problem is that I seem to have been born a few centuries too late to appreciate the contemporary scene.

For example, my impression from the photographs I have seen of 'Woman V' is that it would not stand out in any pre-school line-up of drawings of 'My mum'. Only the fond mum would look at it twice.

Can anyone tell my why it's good? If not, I side with the philistines who don't appreciate the 'funnel' and feel we are quite entitled to express our views.

A.W. Charles
Head Office
Canberra



The picture above shows a model that was made of the 'funnel' two years ago. Coresearch has been unable to get a photograph of the sculpture as it has not yet been erected but promises to do so as soon as possible.

Mistake

I have just received my copy of Coresearch 219 (January 1978), and am perturbed to find the legend to the map, bottom left on the front page, to include the statement 'Unshaded areas: large fires occur at a frequency greater than once every 20 years.'

Once every 10 years is a greater frequency than once every 20 years; once every 5 years is greater still. What was intended was 'smaller' rather than 'greater'.

Also it should perhaps have been pointed out that the frequencies given are *average* frequencies.

B.H. Neumann
Mathematics and Statistics
Canberra

The Division of Forest Research has acknowledged the mistake in the legend referred to and has asked us to advise readers that the table will be altered in future releases.—Ed.

'Coresearch'

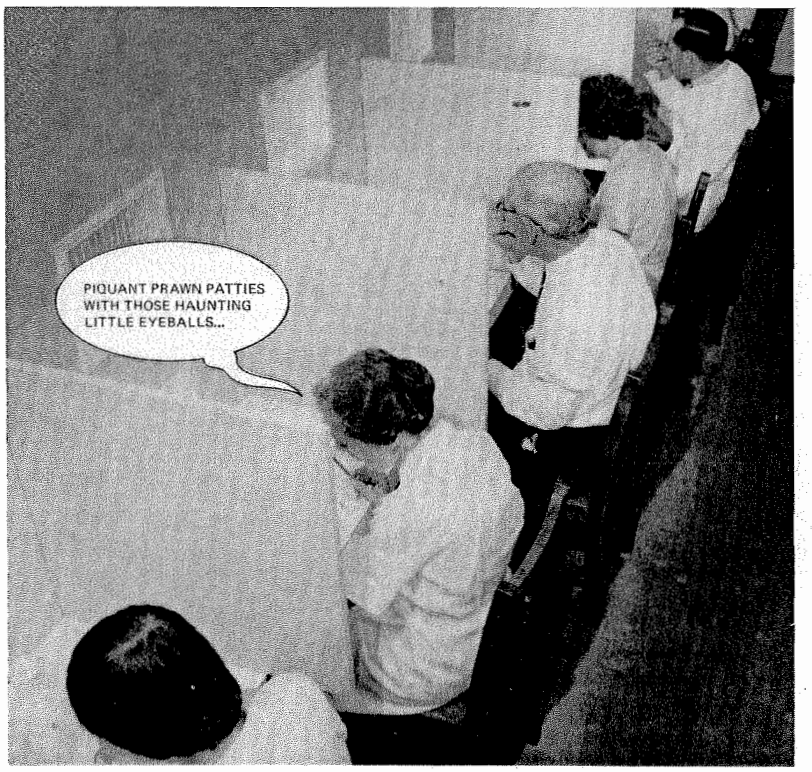
'Coresearch' is produced by the Central Communication Unit for CSIRO staff. It is also circulated to some people outside the Organization who have a professional interest in CSIRO activities.

Members are invited to contribute or send suggestions for articles. The deadline for material is normally the first day of the month preceding publication.

Material and queries should be sent to the Editor, Box 225, Dickson, A.C.T. 2602, Tel. 48 4476

Editor: Dorothy Braxton
Assistant Editor: Barbara Hartley

Science at work



Interest rate drops

The CSIRO Credit Society Limited Cooperative has celebrated its move from Albert Street, East Melbourne, to 9 Queens Road, Melbourne, 3004, with the announcement that as from 1 March the basic interest rate for loans will be decreased by .5% to 10.5% pa, still calculated on quarterly rests.

The money on deposit rates will remain unchanged at present. These are:

Class 1: Amounts deposited by fortnightly deductions from salary—9%

Class 2: Fixed amounts deposited for 12 months or less—9%

Class 3: Fixed amounts deposited for more than 12 months—10%.

Shame on our sham ram

Scientists are usually painted as a deadly serious lot, but the media people who promote that popular image are pretty po-faced themselves if the events of recent weeks are a guide.

It began with January's 'Science at work' photograph in Coresearch (219), showing Sirosam, the Bionic Ram.

Sam, we said, had paced Australia's fastest artificial inseminator for six days before giving up ewes altogether and making improper advances to a champion stud ram—a deed for which he was duly despatched.

It's not the first time the 'Science at work' photo has been taken seriously, but it was thought people would recognise that Sirosam, bless his nuclear little heart (and other unmentionable atomic appendages), would be seen for what he really was—a sham ram.

But no, a lady from *The Australian* rang and inquired where she might learn more of this lately-departed mutton-making miracle. Learning it was a hoax, she put it in her paper.

Undeterred, Sydney's *Daily Telegraph* also rang with a similar request, and finally a Sydney-based wire service picked up the story and sent it to subscribers.

The *Hobart Mercury* printed it, telling its readers 'CSIRO was yesterday inundated with telephone calls from pet lovers objecting to the killing of Sirosam, a champion bionic ram.' The same article revealed the hoax.

Which raises certain questions, for instance—how did all those pet lovers get hold of Coresearch? Do two telephone calls make an inundation?

Or is bionic fertility enjoyed by media minds as well as rams?

Coresearch

A monthly publication for CSIRO staff

May/June/July 1978 221

Act to be changed in August

The Budget session of Parliament beginning in August is expected to provide a green light for fundamental changes recommended for CSIRO by the Birch Committee.

Amendments to the Science and Industry Research Act 1949 under which CSIRO operates cannot be made until Parliament reconvenes, but meanwhile groundwork for change is being laid.

However, many of the Government's recommended changes are not dependent on legislation being amended.

A Steering Committee has been formed to study the Government decisions on the Birch Committee Report.

It comprises the Chairman, Mr V.D. Burgmann, Dr N.K. Boardman of the Executive, Dr J.R. Anderson, Chief of Materials Science, Mr L.G. Wilson, CSIRO Secretary, Mr J. Coombe, Assistant to the Chairman, and Mr K.J. Thrift, who is the Committee's executive officer.

The Committee is studying the Report's recommendations and planning their implementation, which in many cases will require the assistance of a sub-committee or individual.

In addition, it will oversee the preparation of the enabling legislation, and prepare progress reports for the Minister.

The Committee has already sought the views of Chiefs and interested staff on what many regard as the most radical proposal of the Birch Committee—the grouping of research Divisions into Institutes.

Staff are understandably keenly interested in the composition of the Institutes, but no information is available.

For speculators, some clues may be found in the number of research Institutes recommended—a maximum of six—and the present mainstreams of research in CSIRO. Rough groupings can be arrived at in this way, but it will remain a guessing game at least until August, and probably longer.

The lack of information about proposed changes stems partly from the fact that planning is still at a basic stage, and most of the fine detail has not been touched.

It is also due to the fact that the present Executive, to which the Steering Committee is reporting, is near the end of its term and would not want to pre-empt decisions of the new Executive which will guide CSIRO through the two or three years it will take to put most of the decisions into effect.

Similarly, matters such as an increase in CSIRO's funding and a raising of staff ceilings must await decisions on fine detail.

Although the major thrust of the Birch Committee's recommendations is aimed at improving CSIRO's efficiency, the extent of changes would appear to demand some increase in both funds and staff ceilings, particularly if the Organization's flexibility and ability to respond to new demands are to be enhanced.

Other key recommendations of the report, such as the implementation of voluntary retirement at age 55, will almost certainly have to await a change in Government policy for all Commonwealth employees, not just those in CSIRO.

The Prime Minister, Mr Malcolm Fraser, congratulating Dr Paul Wild after the announcement that he would be the next Chairman of CSIRO. Photo: Ross Mackenzie

Dr Paul Wild to be next Chairman

Internationally recognised radio-astronomer and solar physicist, Dr J. Paul Wild, 55, is to be the new Chairman of CSIRO.

The seven-year appointment was announced on 30 June by the Minister for Science, Senator J.J. Webster.

He said Dr Wild would become the seventh Chairman of CSIR/CSIRO on 25 September upon the retirement of the current Chairman, Mr Victor D. Burgmann.

'Dr Wild's appointment is a keystone of the wide-ranging new measures being introduced following the Government's consideration of the report of the Independent Inquiry into CSIRO earlier this year', Senator Webster said.

'His seven-year term of office will provide the necessary stability in top management to enable CSIRO's strengthened links with industry, the community and Government to be put into effect and sustained.'

He said Dr Wild was elected a Fellow of the Royal Society of London in 1970, has been a Fellow of the Australian Academy of Science since 1962, and this year (1978) became a Fellow of the Australian Academy of Technological Sciences and was created Commander of the Order of the British Empire for his services to radiophysics.

'Dr Wild is the man who led the CSIRO Interscan microwave aircraft landing guidance system research team to success in collaboration with the Australian Department of Transport,' Senator Webster said.

'He has worked in the Organization for 31 years and is recognised internationally as one of Australia's most outstanding radio-astronomers and possibly the world's foremost solar physicist.

'His many abilities should fit him well for the demanding job of leading CSIRO—one of the world's leading Governmental scientific research bodies whose innovative work is of such national and, increasingly, international significance.'

Senator Webster said Dr Wild, a former Chief of the Division of Radiophysics, had been an Associate Member of the CSIRO Executive since March 1977.

He would become a full-time Member between 1 July and 25 September while he is Chairman-designate.

'The current Chairman, Mr Burgmann, was appointed in March 1977 when Sir Robert Price retired,' Senator Webster said.

'Mr Burgmann has earned wide respect for his leadership of CSIRO during the period the Organization was under review.

'His contributions to CSIRO successes, particularly in the development of Distance Measuring Equipment (DME) as a navigation aid for civil aviation and later his significant work in the field of the objective measurement of wool—now an internationally accepted practice—will long be remembered.'

PM outlines planned changes

If any reminder were needed of the great contribution made by CSIRO to Australia, it was the success of Interscan, the Prime Minister, Mr Fraser, told the House of Representatives.

In his statement on the findings of the Independent Inquiry into CSIRO, Mr Fraser repeated the Inquiry Committee's observation that 'the world reputation of CSIRO is a source of pride and morale to its scientists and to Australia.'

The Government had decided that, in line with the Inquiry's recommendations, CSIRO should be substantially reorganised.

However, it would remain a single multi-disciplinary research entity responsible to the Minister for Science.

The Government agreed that CSIRO's role should be more clearly defined by the Science and Industry Research Act (1949) to make it clear that its main role would be scientific and technological research in support of Australian industry, community interests and other perceived national objectives and obligations.

The physical and biological sciences would remain the major concern of CSIRO research, he said.

Long-term research for the community's benefit which industry and other research organisations were unable to carry out, and fundamental and short-term problem-oriented research related to the role of the Organization would be undertaken.

CSIRO would have a major role in helping Australia meet its international obligations, contributing to the scientific and technological needs of Third World countries as part of Australia's foreign aid program.

CSIRO's autonomy in setting research project objectives would be maintained, with Ministerial discretion being retained as an option.

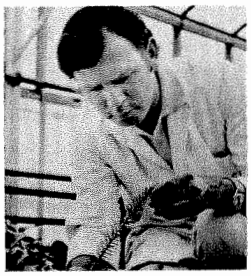
Mr Fraser said the Government had accepted the recommendation that current programs should be terminated where judged inappropriate by CSIRO's revised advisory and consultative machinery.

Farewell

A large gathering of CILES staff farewelled Jack Chamberlain, Officer-in-Charge of the Printing Unit at a special function at the Printery at the end of last month. Those present included many former colleagues. Good wishes to a man who had made many personal contributions came from inter-State Divisions and the Chairman, Mr Burgmann, has sent a special message to him on behalf of the Organization.

1978 Study Awards announced

Hart Schroeder



John Adeney

Wendy Parsons

Don Gwynne

The 1978 CSIRO Study Awards have been granted to Hart Schroeder, John Adeney, Don Gwynne and Wendy Parsons.

Hart Schroeder, a senior technical officer in the Storage Protein Biology group at the Division of Plant Industry, will study chromosome rearrangements in peas and the genetic basis of seed albumins at the Institute of Genetics in Bonn, West Germany.

At the Wiebullsholm Plant Breeding Institute in Landskrona, Sweden, he will investigate computer based linkage analysis in peas and chromosome and gene mutants in the World Pea Collection.

An experimental officer at the Division of Irrigation Research, John Adeney will go to the University of Florida to take a course in the identification, control and utilisation of aquatic plants.

He will also visit the US Army Corp of Engineers' Waterways Experiment Station at Vicksburg, Mississippi, where biological control of aquatic plants is underway.

Don Gwynne, senior staf. development officer at Head Office, will study advancements in management development programs and in industrial democracy.

He will visit the Manchester Business School, Loughborough University at Leicester, the Tavistock Institute of Human Relations in London, Stanford Research Institute in California, Harvard Business School in Massachusetts and DSIR in New Zealand.

The media-liaison and public relations officer at the Division of Forest Research, Wendy Parsons, will study techniques of science and technology communication.

Wendy will visit forestry organisations in Canada, United States, United Kingdom and Europe to learn methods of preparing and presenting scientific material.

She will also investigate the ways in which the media uses this material and is particularly interested in any feedback mechanisms that help to evaluate it.

First award holders meet in Washington

Two of the holders of the first CSIRO Jubilee Study Awards, Maurie Woodward, senior draughtsman of the Division of Land Resources Management in Perth and Brian Lee, science writer at Head Office, recently met in Washington, D.C.

Maurie, after spending several weeks at the Department of Instructional Media, Utah State University, went to Washington to work at the Smithsonian Institute and other public relations-oriented agencies including the National Park Service and National Geographic Society. He has since spent some time in Chicago.

Maurie's main interest has been in modern techniques of graphic reproduction for publicity and public education purposes. He returns to Australia later this month.

Brian, who is more concerned with the written word, found Washington equally exciting. He made contact with editorial and writing staff from Science Magazine, BioScience, Mosiac (National Science Foundation), US Department of Agriculture, the Smithsonian Institute and a number of others. Brian will visit the UK before returning home.

DBR staff answer 'queeries'

Sitting at the end of a telephone to answer enquiries on all types of building problems does have some lighter moments, according to the staff of the Technical Enquiry Service of the Division of Building Research.

Information Officers, Harry Heath, Hal Christian and Rob McNamara receive 15 000 phone calls annually from all over Australia.

Two recent 'queeries' presented no great problem to the service.

An architect wanted to know how high up a building should he put fly-wire screens. Multi-storey building costs being what they are he wanted to know how high flies flew. Not without a sense of humour the staff suggested these answers:

Over 3000m it was possible to use 15mm mesh. Over 10 storeys it did not matter as the flies would use the lifts.

Another officer suggested a one-way screen to stop flies coming in but allowed those who did to get out.

However on a more serious note it was pointed out to the caller that for buildings over three storeys screens to stop flies were somewhat redundant but lights in the building would tend to attract other insects. Fly-wire screens can in this way be seen to have a multi rather than a single purpose.

Another call was from a most distressed man who lost his favourite false teeth to the sewer via the toilet. He rang up to find out if he could hire or borrow any remote control equipment to retrieve them.

It was suggested he uncover the sewer inspection opening near the front boundary of his property and lower down chicken wire.

He was told to flush his toilet continuously until the teeth became caught in the wire—presuming they had not already passed this point. He was then to lower down a stringed weight with a mastic solution on one end and gently retrieve his teeth.

An hour later he rang back to say that after 20 minutes of continuously flushing the toilet the teeth arrived at the chicken wire, and, following the instructions, he easily recovered them.

Asked whether he intended using them, he replied:

'Certainly, but, of course, I'd wash them first.'

Personal assistant to RP Chiefs is honoured

Two members of the staff of the Division of Radiophysics received awards in this year's Queen's Birthday Honours.

They were Dr Paul Wild, Chief of the Division, who is a member of the Executive and now Chairman-designate, and Miss Sally Atkinson, who has given long service to the Division as personal assistant to the various Chiefs.

Dr Wild received the CBE (Commander of the Order of the British Empire), for service to science in the field of radiophysics, and Miss Atkinson, a BEM (British Empire Medal) for public service with CSIRO.

A number of other people who received honours, though not specifically for their service with CSIRO, have nevertheless had a close association with the Organization.

They included:

Companion of the Order of Australia (AC):
Alfred Moxon Simpson, member of the South Australian State Committee, service to business and industry

Officer of the Order of Australia (AO):
Dr Lewis Walter Davies, member of the Advisory Council, service to science and industry

Companion of the Order of St Michael and St George (CMG):
Lady Price (Joyce Ethel), wife of the former Chairman of CSIRO, Sir Robert Price, service to the Girl Guides
Alfred Dunbavin Butcher, member of the Victorian State Committee, service to the Zoological Board of Victoria

Officer of the Order of the British Empire (OBE):
Mr Victor Edward Jennings, part-time member of the Executive, service to the building industry
Professor Peter Scott, member of the Tasmanian State Committee, service to urban planning
Mr Leonard Antill Pockley, member of the New South Wales State Committee (1954-1963), service to the livestock industry and agricultural education.

Re-appointed to AAT Board

The Governor-General, Sir Zelman Cowan, has approved the re-appointment of Dr Paul Wild, a member of the Executive and now Chairman-designate, for a further term as Chairman of the Anglo-Australian Telescope Board.

Appointment

The Governor-General, Sir Zelman Cowan, has appointed Mr Victor Burgmann a Member of the National Library of Australia for a three-year period.

Correction

In the last issue of 'Coresearch' under a feature headed 'Management changes announced' the names of the Chairmen of the two different Executive Committees were reversed. The story should have read:

The work of the Program Committee and the Interim Executive meetings will now be handled by two types of Executive Committees—the Executive Committee (Policy Development) chaired by Mr Victor Burgmann, and the Executive Committee (Operations) chaired by Dr A.E. Pierce.

Workmanship

Laboratory craftsman Milton Jenkins was a winner of the Rotary Club of Lindfield 'Pride in Workmanship Award'. Milton was nominated by the NML for his outstanding technical ability and dedication to his work which made him a deserving winner.

UNESCO appointment

The Secretary of CSIRO, Mr L.G. Wilson, has been appointed Chairman of the Australian National Commission for UNESCO.

Mr Wilson will fill the position vacated by Professor R. Slatyer who has relinquished the office following his appointment as Ambassador to UNESCO.

New lab

A laboratory being built at the Sydney suburb of North Ryde will improve the processing of coal, iron ore and other minerals used in energy research projects. It will become part of the CSIRO Minerals Research Laboratories complex.

Work on the processing of iron ore will be carried out in a part of the laboratory especially designed and ventilated to avoid contamination between the iron ore and coal or other minerals.

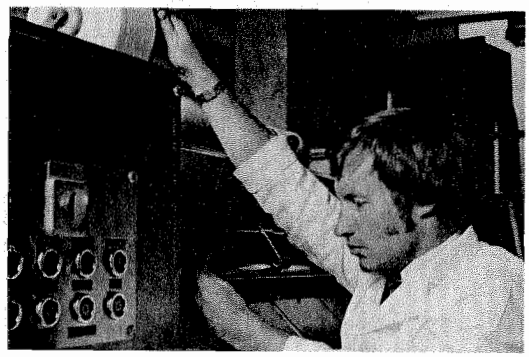
Construction is being carried out under a $692 000 contract awarded to Belmadar Constructions Pty Ltd of Erskineville, NSW. Work is expected to be completed by October.

Cotton research has spin-off for woollen industry

Mention textile research and CSIRO in the same breath and usually wool and the Division of Textile Industry come to mind. The association will, of course, be correct most of the time, but in recent years the Division's research programs on another Australian natural textile fibre—cotton—have grown significantly.

Work on cotton was started in 1968 when a small service group was set up at the Division to test the textile performance of new breeds of Australian cotton.

Jill Trevaskis and Gary Robinson discuss results of strength measurements on a series of cotton-fibre samples.



Grahame Abbott sets up the Division's small open-end spinning machine. Photos: John Card

Since then the cotton-growing industry has expanded to such an extent that this year, for the first time, Australia will be exporting more cotton than is consumed domestically.

With this growth, specific problems with the use of Australian cottons have become increasingly apparent, and since 1972, the unit has become more and more involved in cotton research.

Testing, however, is still a very important function of the section, providing the necessary link between the cotton growers and the textile manufacturers.

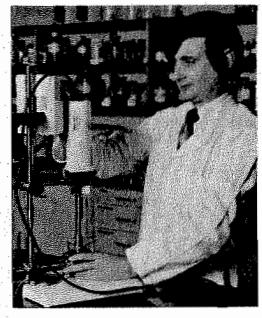
'We now test 5000 samples of cotton a year,' said Gary Robinson, who supervises the testing service.

'Our samples come to us from the Division of Plant Industry's Cotton Research Unit at Narrabri, NSW, and we work closely with the scientists there.

'We test the quality of the cotton they produce, and so are able to advise on whether it will be suitable for the textile market or on what properties need to be improved.

'We are also looking at the consequences for Australian cotton of the widespread introduction of new spinning technology', said Gary.

'We suspect that open-end spinning—a Czechoslovakian development that increases the speed of conventional cotton spinning three to five times—will require different cotton qualities, that is, a stronger fibre but possibly with a shorter length.



John Rippon mixes an experimental transfer-print paste for cotton.

'If this were so then there could be far-reaching effects on agricultural practices.'

Mutual benefits

The mixing of cotton and wool research on one site has brought benefits for both fibres.

In particular for wool, the ready availability of cotton-processing equipment has greatly facilitated investigations of the possibilities of processing wool on this equipment.

Success in this sort of work could dramatically increase the market demand for wool, as 90 per cent of the spinning and associated machinery currently in use throughout the world is designed for cotton.

One early result of the work is a simple modification to cotton equipment which enables certain types of Australian wool to be spun on the modified equipment, without the need to cut or break the fibres to bring their length nearer to cotton's.

'Several mills have adopted the modification, and it is helping the Australian Wool Corporation in a wool promotion campaign in Indonesia, a country with no wool-processing equipment,' said Gary.

As for 'spin-offs' for cotton from wool research, scientist Grahame Abbott is attempting to apply some of the principles of self-twisting to improve cotton processing.

Another improvement to cotton spinning could result from Grahame's studies of the effect of high-voltage discharges (corona) on cotton fibres using techniques earlier investigated with wool. The discharge doesn't damage the fibres but increases the friction between them, so that they form a stronger yarn.

Nature makes it difficult

As with other crops, nature is not always kind to Australian cotton, with flooding or insect infestation often drastically affecting the quality of the product. One result is the high percentage of immature and therefore weaker fibres in the crop.

These fibres break and agglomerate during processing, causing surface 'neps' which dye a lighter colour, giving an uneven appearance to the fabrics.

Textile chemist John Rippon is looking for ways of overcoming this problem.

'One way is to mercerise the cotton—a treatment with sodium hydroxide, which swells the fibres and so eases dye penetration. Unfortunately, this is an expensive process, so we are trying to find cheaper treatments that act in a similar way,' said John.

John is also interested in colouring cotton by transfer printing, that is, printing a design on paper and, at a later stage, transferring it to the textile by hot pressing.

'Use of this technique for polyesters has grown tremendously over the last decade, but so far the results on cotton are not satisfactory,' said John.

The dyes suitable for polyester have poor attraction for cotton, so are readily washed out, which of course is unacceptable to consumers.

'We're trying to develop treatments for cotton which will improve its attraction for the conventional dyes and we're also investigating the synthesis of new dyes.'

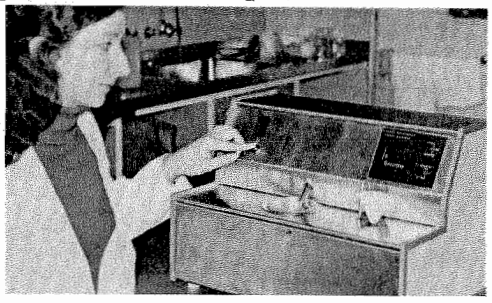
Another area of John's research is the improvement of the easy-care properties of wool-cotton blends, in particular their wrinkle-recovery.

To sum up the work the Division says:

The cotton research unit is helping farmers produce better cotton, helping the textile manufacturer produce better fabrics of both cotton and wool, and helping consumers obtain a better product for their money.

Wheat Research Unit exports first protein analyser to S.Africa

The first overseas order for a protein analyser developed by the Wheat Research Unit and manufactured under licence to CSIRO by Labtest Instruments, NSW, was despatched last month to the South African Wheat Board. Sixty of the machines already have been sold in Australia.



Michelle O'Connor runs some tests on the Labtest rapid biuret protein analyser.

Separating wheat of differing protein content is an annual headache at Australian silos when harvesting is in full swing.

The standard protein test takes at least 20 minutes resulting in costly transport delays. Faster methods have been developed overseas, but the apparatus is very expensive.

Now CSIRO has come up with a solution—a relatively simple, inexpensive analyser capable of measuring a wheat sample's protein content in six minutes.

As Australian wheat is now sold according to a guaranteed protein figure, it is important to segregate the crop according to protein content quickly, efficiently and reliably under hot, dusty silo conditions.

After weighing a ground sample, the 'start' button is pressed on the Labtest instrument and a reagent is added to the sample. After a reaction time of five minutes, a small sample of the reaction mixture is automatically pumped over into a filter funnel.

An inbuilt colorimeter measures the absorbance of the coloured filtrate and converts it automatically into percent protein which is displayed in digital form. This method is accurate to within .1 per cent protein.

The protein content of Australian wheat varies between eight and 16 per cent. Hard wheat of high protein content is in demand in Western countries for bread making, and in Asia for making certain types of noodles.

Wheat of lower protein content is required for biscuits, cakes and Japanese white noodles. Hard wheats of low protein content have very limited market value.

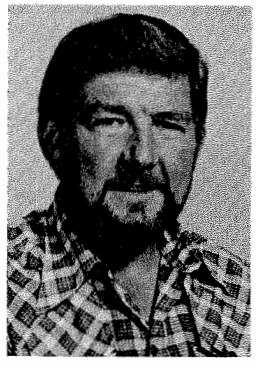
Hard wheat of high protein content commands high prices, and the CSIRO-Labtest analyser will allow high, medium and low-protein grain to be segregated at silos for optimum market prices later on.

Chief awarded D.Sc.

Dr John Possingham, Chief of the Division of Horticultural Research, has been awarded the degree of Doctor of Science from Oxford University.

The degree was conferred in recognition of Dr Possingham's contribution to plant research over the period of his working career which began in 1957 as a member of the Division of Plant Industry in Canberra.

In 1962 Dr Possingham was made Officer-in-Charge of the CSIRO Research Station at Merbein, Victoria. In 1967 when the Division of Horticultural Research was created from the CSIRO horticultural laboratories at Adelaide and Merbein, he became its first Chief.



From radar to Interscan...

Stars and navigation linked from earliest times

There is, if you like to take the long view, a certain historic inevitability about Australia's new Interscan development.

It was the establishment of astronomy as a science that led in the late renaissance to the development of navigation and this in turn to the age of European sea exploration that opened up the modern world as we know it.

Australia, particularly, can trace its origins as a nation to astronomy. Two centuries ago Captain James Cook's Royal Navy expedition to study the transit of Venus—as vital for astro-navigation as it was for astronomy—had as a secondary objective the search for the rumoured (and possibly found and forgotten) southern continent.

For centuries navigators have determined their position using observations of the sun and the stars. These old navigators relied on information provided by the classical astronomers.

It seems appropriate that modern navigational aids for aircraft, operating at radiofrequencies, have been proposed by scientists at the CSIRO Division of Radiophysics, a leader in the field of radioastronomy.

The Division had its origins on the eve of World War II when Britain shared its radio location and ranging secrets with Australia.

There were rapid and independent developments in radar in Australia during the war years for defence against ships and aircraft attack.

Some of the equipment developed by what was then CSIR was acknowledged as the best of its kind available in the world. It played a prominent part in the war effort.

At the end of the war, aviation began its rapid expansion.

Air transport has always been of major importance to Australia because of its internal distances and the even greater distances from its cities to the northern hemisphere countries with which it is linked by trade and culture.

Moving into peace, the Division began to focus not just on radio sources in space but also on aircraft navigational aids, the basis of a safe and efficient air transport network.

By 1945 an experimental distance measuring equipment (DME) set had been built and was operating commercially by 1947.

The discussions focussed on the present VHF (very high frequency) landing systems, which are basically 1940's technology.

These have served the aviation world well but have drawbacks.

These instrument landing systems (ILS) create in effect a sloping narrow track in the sky, extending from the touchdown point on a runway. Indicators on the flight deck tell the pilot if he is above or below or to the left or right of this narrow radio signal.

This means that for every runway there is only a single approach path. This limits runway capacity at peak times. It also means

This article was specially written for 'Coresearch' by the well-known Australian journalist, John Stackhouse.

Installation and alignment of the compact torus antenna at Sydney's Kingsfo announcement of ICAO's choice of Australia's system as the world standard.

While an Australian DME network became established in the 1950s it was not until 10 years later that a similar system was operating in the United States.

Because of commercial lobbying and pressure, a different—and less efficient—frequency for their DME system was chosen. This was a lesson that was not to be forgotten.

The Division of Radiophysics went on to establish Australia as a leader in radioastronomy and to develop radical new techniques and equipment to observe phenomena such as pulsars, which up to then hadn't been known to exist.

But its origins in the problems of locating aircraft by radio means had not been forgotten.

When a new Chief of the Division, Dr Paul Wild, took over in 1971, a dialogue began with what was then the Department of Civil Aviation (now Transport) about new equipment that was believed necessary.

that residential areas underneath are unfairly inflicted with noise.

Another disadvantage is that the signals can be distorted by buildings and terrain.

Moving up the frequency spectrum from very high to microwave irons out the latter disadvantage and also creates the possibility of linking a broader path of radio signals with inflight, automated guidance systems in aircraft so that approaches, curved in horizontal angle and in slope, can be flown.

This gets away from the string of beads problem with today's ILS.

Dr Wild, applying radio-astronomy experience, suggested a time-referenced scanning beam system as the most suitable.

Airport transmitters put out a fan-shaped sweep of signals in both the horizontal and vertical planes, in essence like the light from a lighthouse which has been made to sweep from right to left and back again with a second beam sweeping up and down.

Equipment on the aircraft times the interval between the up and down sweep and in the other plane, the right and left ones.

They combine this with the information from an advanced and highly accurate DME to locate the approaching aircraft precisely.

Its computers can then be programmed to bring it down for an exact touchdown in any weather.

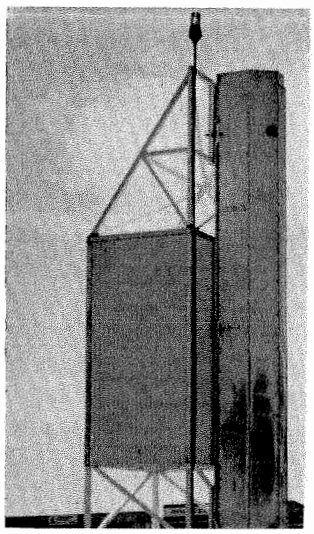
American scientists had also been working on the same idea.

One version was a mechanically swept antenna that awed with its complexity the first Australians who saw it.

Another was a phased array antenna system, which is all electronic and which the Americans have developed to a high degree for defence purposes, but is relatively complex.

Dr Wild and his CSIRO team, in association with Department of Transport engineers (with Amalgamated Wireless (Australasia) Ltd. and with modelling studies carried out by the University of Sydney), developed and proved a reflecting antenna (again a bonus from radioastronomy). This was much simpler and could be patented.

Later as the MLS development continued, they came up with the



The most recently developed antenna i shown undergoing flight tests at Sydney a

Radar project was clandestine work

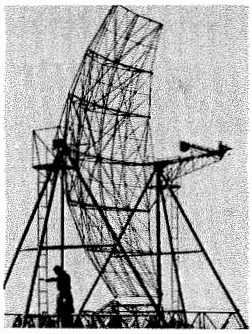
Somewhere around the year 2000, if aircraft have not by then become obsolete, other researchers and engineers will be looking for the next development from Interscan.

And if someone from CSIRO—if it still exists—is writing a story from radar to space travel they will turn back the yellowing pages of wartime days and read about those early years when radar was very much on the secret list.

Perhaps one of the most interesting sidelights of the story as it can be told to date, is that the Division which did the work—Radiophysics—was to produce some of Australia's most distinguished physicists and radio-astronomers. Some have won world acclaim.

It has also produced three of CSIR/CSIRO's seven Chairmen—Sir Frederick White, Mr Victor Burgmann and now Dr Paul Wild.

The first person to be involved was a physicist, David Forbes Martyn, who was chosen by the



A World War II helically scanning microwave early warning radar installed and being tested by Radiophysics staff at Collaroy, NSW.

then Prime Minister, Joseph Lyons, to go on a clandestine mission to England after the Australian Government had been asked to send its top physicist to London where upon he would be briefed on a secret new defence development.

'Utmost secrecy is essential and the choice of the man of greatest discretion possible. . .' read the cable.

Martyn returned with the secrets of radar and to attract as little attention as possible to the group which was set up to work on the new project for Australia, it was attached to the new CSIR National Standards Laboratory then being built in the grounds of Sydney University.

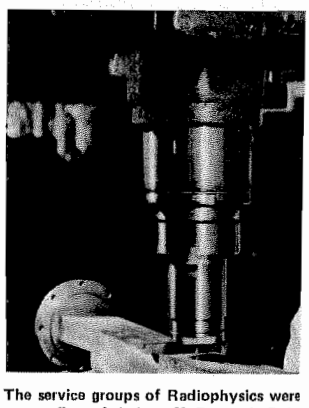
In those covert days of 1940 when the staff went to work through security-guarded gates, the present Chairman, Victor Burgmann, was an electrical engineer. He was given a radar set known as air-to-surface vessel (ASV) which had been sent out from England without instructions. His task was to get it going. Knowing the broad principles of radar he was able to trace the circuit and deduce how it worked.

As he said later: 'It was an interesting moment when I connected it to the mains for the first time and switched it on, hoping I wouldn't destroy the first ASV set in the southern hemisphere.'

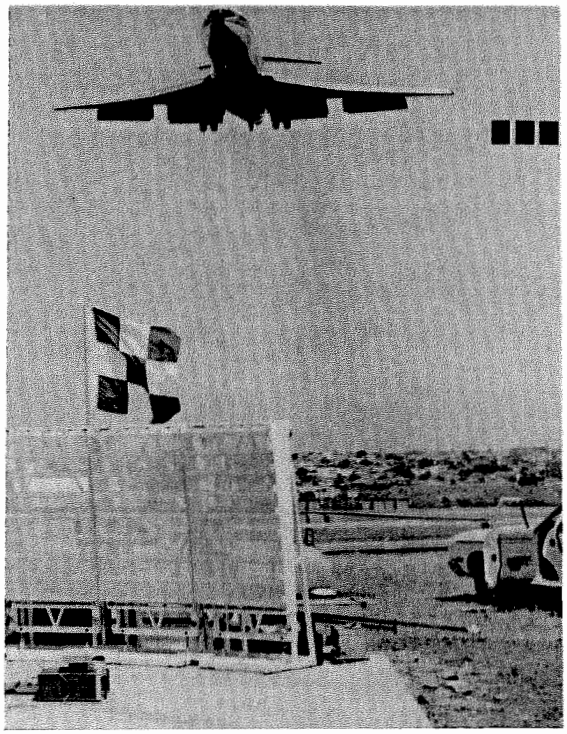
Soon afterwards with the help of a PMG technician, he installed the first set in a DC3 aircraft and Australia received its first echoes from a real target—a merchant ship steaming down the coast.

Shortly after the outbreak of war, Frederick White, then a Professor of Physics at Canterbury University College in New Zealand, was recruited to assist with the research and development of radar in CSIR. In 1942 he became Chief of the Division.

Under his leadership a group of physicists including names like Joe Pawsey, Jack Piddington and Fred Lehany to mention but a few, went on to make significant contributions to the war effort.



The service groups of Radiophysics were gram. One of their staff, Domenic Delv an experimental jig for microwave coupli

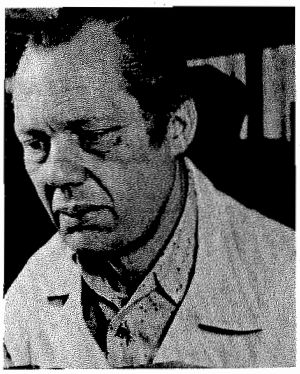


...rd Smith Airport. This photograph was taken shortly before the
Photos: John Masterson

Interscan family of antennas that provide the accurate swept beam required without moving parts.

Once the Australian system was invented and tested, the problem was to get it adopted as an international system.

s the conical elevation lens fed array, irport.



heavily committed to the Interscan pro- ecchio, mills to extremely high accuracy ng measurements.

With memories of the original DME change of frequency gauge, the CSIRO and Department of Transport teams began close co-operation with the Americans.

Having originally gone cold on time referenced scanning beam (TRSB), the Americans now saw its virtues and threw their own efforts behind it.

Other countries such as the Soviet Union backed it so that when the International Civil Aviation Organization's specialists made the eventual choice in Montreal this year, it won by a majority vote from a British-developed Doppler system.

The position now is that Australia holds some key patents for antennas which may be used in MLS installations.

These patents are seen as being the basis for an Australian launch into the MLS equipment market.

The Australian Government, through the Department of Productivity, has established a joint venture company with industry called Interscan Australia Pty Ltd, which will require about $15 m to develop the Australian concepts and put them on to the world market.

Discussions are taking place with a leading United States supplier of aircraft navigational aids in the hope that this will give Australia a share of the big US market.

But on top of this, there are possibilities for Australian contracts in other areas such as the Middle East and Asia where complete 'turnkey' installations will be required.

Government Ministers and spokesmen have pointed to one lesson from Interscan development. This is that big opportunities exist for Australia in areas of high technology exports where the ingenuity and versatility of Australian scientists and engineers give it an edge that labour-intensive products do not have.

High technology can only begin with basic research and innovation. It is by such techniques as keeping its eyes—and its radio antennas—on the stars that these opportunities arise.

'per ardua ad astra'

The people behind Interscan

The credit for the basic concept of Interscan goes to Dr Paul Wild. He had the foresight and drive to get the project going and keep it moving both in Australia and overseas.

But if he 'fathered' the project it has since been mothered and nurtured by an enthusiastic group of colleagues.

There has been a lot of input from people outside CSIRO—from the Department of Transport and from Amalgamated Wireless (Australia) Ltd—but within the Division of Radiophysics there is a strong team which has already put in many long hours on the project. And there is little slackening of work for now they have the responsibility of refining the system and making sure that Australia will benefit.

The main people in the team include:

Mr Harry Minnett (Acting Chief): overall project management and technical leadership in antenna development.

Brian Cooper (leader of the Applied Research Group): systems analysis especially for new lens designs and modulation systems.

Dennis Cooper: development and systems analysis. Represented CSIRO with Dr Wild at international meetings.

Doug Cole: experimental receiver/processor development and antenna monitoring.

Don Dillon: logic design for scanning antennas, monitoring and receiver design.

Zain Kachwalla: experimental work on airborne receiver processor and microwave stripline component development.

John Brooks: microwave engineering of original feasibility torus antenna.

John Craggs: hardware development and initial field evaluation of antennas.

Charles Monticone: static antenna measurements, digital design for antenna sub-systems, antenna hardware development.

Diet Ostry: applied mathematical/physicist—assisted in systems analysis and fundamental antenna analysis.

Bruce Thomas: developed reflector/feed systems for first torus elevation antenna.

Don Yabsley: developed reflector panel manufacturing techniques for first torus antennas.

Frank Tonking: microwave ferrite component developments for landing systems.

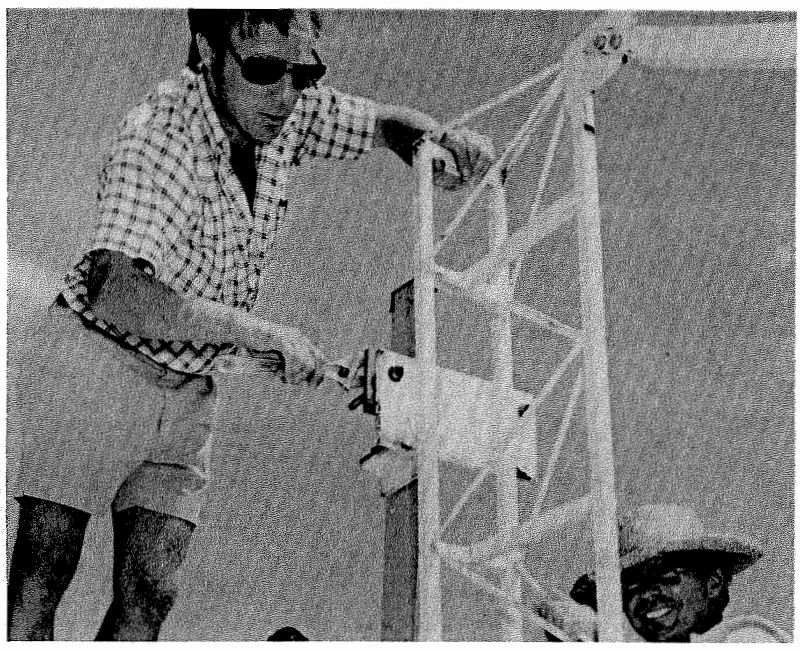
Glynn Rogers: originally worked on Interscan engineering at AWA. In 1976 joined Radiophysics to develop microwave lens technology and modulation systems.

Geoff Poulton: joined program in 1977 to develop folded microwave lens technology. Expert on reflector antenna design.

Geoff Lee and Mark van Hemelryck: technicians assisting with experimental programs and hardware development.

Behind the team there has, of course, been a lot of support from others. There have been the service groups, photographers and drafting personnel, clerical staff and secretaries who have worked long hard hours to get essential service work completed on time. Along with the wives of the team members, they have shared the pressure and the pride.

When it was all over the Division took time out for a celebration—from left: M Harry Minnett, Dr Paul Wild and Mr Brian Cooper.



Charles Monticone and John Craggs adjust an accurate template used for setting the reflector panel surfaces.

Lexie rescues a sick mountain duck in WA

A Western Australian mountain duck which has been an inhabitant of the Perth Medical Centre for some time, owes its life—like a lot of WA birds—to Lexie Nicholls, a technical officer at the Helena Valley Laboratory of the Division of Wildlife Research.

Lexie, who has already been honoured for her wildlife rescue work, was asked to help the bird when it was found suffering from botulism in an ornamental lake.

Respiratory massage for 26 hours kept it alive.

'When the duck arrived it had almost stopped breathing,' she said.

'Its beak was too long for mouth-to-mouth resuscitation so I tried respiratory massage, a gentle version of cardiac stimulation.

'My mother and I continued the treatment every two seconds for the next 26 hours.

'We did not dare stop because every time we tried the duck's eyes would roll up and it would begin to asphyxiate.'

Lexie with the mountain duck she and her mother saved. Photo: Courtesy West Australian Newspapers Ltd., Perth.

Asian food projects get help from CSIRO scientist

Dr Alex Buchanan who has spent the last five years on secondment to the Australian Development Assistance Bureau (ADAB) in Asia, paid a flying visit back to Australia last month.

While he was here he was presented with the Australian Institute of Food Science and Technology Award of Merit for 1978 for meritorious contributions to food science and technology, particularly in relation to the nutritional needs of the developing world.

Before going to Thailand in August 1973, Alex had spent a number of years working at the Dairy Research Laboratory at Highett on the development of new products from milk and its constituents.

He had a particular interest in high protein foods for use in developing countries and this led to the successful Australian milk biscuit which was produced commercially in a number of countries, especially Zambia.

When the Thai Government requested Australian assistance for help in the development of weaning foods for infants, Alex was asked to undertake the project in association with a research team at Kasetsart University.

The project wasn't simply a matter of producing a baby food. It had to be based as much as possible on local raw materials, it had to suit the eating habits of Thai children and the ability of Thai parents to pay for it.

Consideration had to be given to packaging for while it might be cheaper to buy the commodity in the 'large economy size', Thai parents living on a day-to-day existence would not be able to buy in quantity. Moreover, village women seldom have the ability to store food safely for any length of time.

With all those constraints upon them, the team still succeeded in producing a commercially viable product and a dry precooked powder, similar in appearance to 'Farex', is now being manufactured by the university in collaboration with Lever Bros. It is also being test marketed in other countries in Asia.

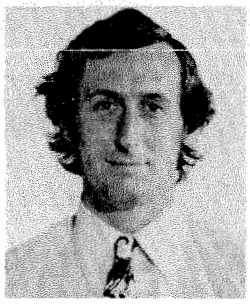
This was by no means the first attempt to produce such a food. The failure of other schemes to succeed has generally been attributed to narrow vision in the overall planning whereas, according to ADAB, an essential factor in the success of this project was the wide experience and expertise Alex had had in all the related fields.

In 1974 Alex was appointed the Australian Liaison Officer to the ASEAN sub-Committee on Protein. The Australian Government has committed $5.5 million to its Protein Project and Alex has been an advisor to various national committees.

The initial research, well under way, includes the identification, development and utilisation of low cost protein foods, the processing and utilisation of full fat soy flour, improvement of soy fermentation technology and nutrition and metabolic evaluation.

Last year Alex was also appointed Australian Liaison Officer to the ASEAN Food Handling Project which covers a range of problems related to handling food products after harvest, including grass, fruit, vegetables, fish and livestock. Australia is also contributing substantially to the cost of this program.

Alex, who now lives in Kuala Lumpur with his family, retains his dynamic interest in this work and, according to ADAB, if it hadn't been for his enthusiasm, scientific capabilities and realistic approach, the progress of some of the sub-projects would have been severely hampered.



Dr Buchanan

RMIT award

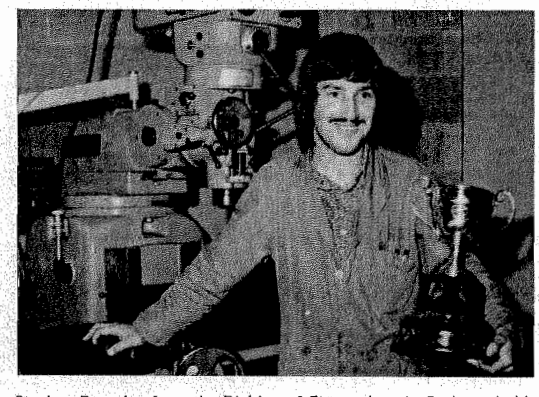
Mr Des Barber of the Printing Unit, Melbourne, has been awarded the certificate of Printing and Graphic Arts and the Planning and Estimating Award from the Royal Melbourne Institute of Technology.

His thesis topic was terminology used in photocomposition and supporting functions.

Australian paper

Edmund Layton, National Measurement Laboratory, was invited to present his paper 'Photogrammetry in Metallic Hardness Measurement Instrumentation' at the 2nd International Measurement Confederation (IMEKO) Symposium in Stuttgart in May. He is the first Australian to present a paper at this international venue since it started in 1952.

Apprentice given award



Stephen Downing from the Division of Entomology in Canberra holds the Principal's Trophy which he was awarded along with the ACT Employer's Federation Prize for his outstanding performance in the Fitting and Machine Trade Course he completed last year at the Canberra College of Technical and Further Education. Steve was also ACT Apprentice of the Year.

SA State Committee secretary retires

Mr Doug Dewey, who was closely involved with the work on trace elements which ultimately led to the production of the cobalt pellet, has retired.

For the past 11 years Doug has been secretary of the South Australian State Committee but before that he spent about 30 years working in the Divisions of Animal Health and Human Nutrition.

It was in 1939 that he joined the team working with Dr Hedley Marston at the Animal Nutrition Laboratory of Animal Health and Doug recalls that this was a time when CSIRO was small enough for the Chairman, Sir David Rivett, to know all the professional staff personally.

Adelaide staff and colleagues paid tribute to his work for the Organization at various farewell functions. In his retirement Doug has a special ambition—'to play golf eight days a week.'

Honours for staff members

Seven CSIRO scientists have been honoured by the Australian Academy of Science.

Dr Lloyd Evans, Division of Plant Industry, has been elected President of the Academy for a four-year term.

A member of the Executive, Dr N.K. Boardman, has been elected Treasurer and Dr H.J. Frith, Chief, Division of Wildlife Research, was elected to the Academy's Governing Body.

Dr L.M.Clarebrough, Division of Chemical Physics, Dr R.D.B. Fraser, Division of Protein Chemistry, and Dr W.T. Williams, Division of Tropical Crops and Pastures, were elected Members of the Academy.

Dr R.N. Manchester, Division of Radiophysics, was awarded the Academy's Pawsey Medal for distinguished research in experimental physics by scientists not over the age of 35. Dr Manchester has an international reputation for his work on pulsars.

Sir William Vines retires

Sir William Vines, Chairman of Dalgety Australia Ltd., has retired from the Executive of CSIRO.

He was first appointed in March 1973, the term of appointment being subsequently extended three times.

In his capacity as Acting Chairman of the Australian Wool Commission, member of the Australian Wool Board and the International Wool Secretariat Board, and Chairman and Director of various other companies he brought to CSIRO a wide range of managerial skills and an in-depth knowledge of primary and secondary industry.

Replying to a speech made by the Chairman, Mr V.D.Burgmann, at a recent Advisory Council dinner, Sir William praised the findings of the Government Committee of Inquiry and told the gathering that the recommendations only substantiated his feeling that CSIRO was an organisation he had been proud to be associated with.

Divisions farewell two distinguished Chiefs

Two of CSIRO's best known Chiefs, Dr Roy Muncey of Building Research and Dr Lloyd Rees, Chemical Physics, have retired. There have been various farewell functions for them and staff hope that they will retain some association with them in the years to come.

'Think Change'—those two words displayed prominently in the office of Dr Muncey represent a personal belief that guided him through his 34 years with CSIRO.

And for Dr Muncey who retired at the end of May, those words will be acted upon.

His new activity as a farmer at Hamilton in Victoria's Western District is a far cry from his first days with CSIRO when he joined the Division of Tribophysics in 1944 and undertook a war time task of measuring the muzzle velocity of shells fired from battle ships.

In 1946 he was appointed to the Division of Building Research and led the Architectural Physics Group for 20 years where his research included thermal investigations and room acoustics. His research reports on this work formed the basis for his degree of Doctor of Applied Science conferred in 1969.

Dr Muncey believes that the Division's research should be oriented towards a practical application and in line with these thoughts he has been responsible for encouraging the Division to study human factors in building as well as the more traditional areas such as materials, heat and sound.

His appointment as Chief of the Division of Forest Products in 1966 started his involvement with the timber industry.

In 1971 when much of the Division of Forest Products and the Division of Building Research were amalgamated, Dr Muncey was appointed Chief of the newly formed Division of Building Research.

Appointment as a member of the Standing Committee of the Australian Forestry Council preceded his appointment as Chairman in 1975.

He has also been a member of the Timber Promotion Council of Victoria since 1969.

He is also a member of the Australian Housing Research Council and the Building Research and Development and Advisory Council.

Besides his scientific achievements, Dr Muncey has distinguished himself in several extra-curricular activities.

As advocate for the CSIRO Officers' Association, he successfully presented the research scientists' case before the Arbitration Court in 1963.

In 1965 he investigated superannuation problems on behalf of the High Council of the Commonwealth Public Service Organizations.

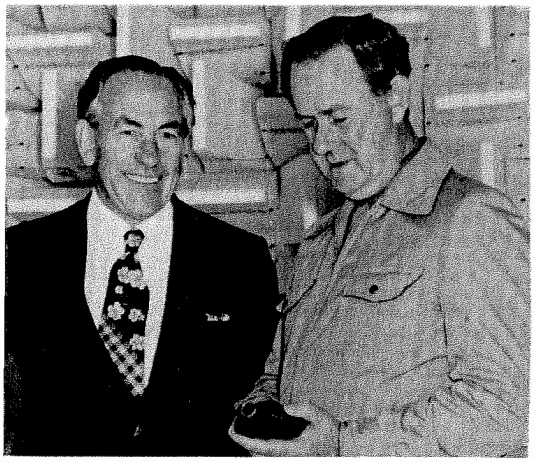
He has been Chairman of Directors of the CSIRO Cooperative Credit Society Limited since 1968 and during his term the society has grown by a factor of four.

Dr Muncey has also been a member of the Council of the Victoria Institute of Colleges since 1968 and served as President from 1974 to 1978.

In 1976 he was elected a Fellow of the Australian Academy of Technological Sciences.

Dr Muncey sees scope for continuing staff involvement in cooperative activities such as a health fund or car insurance—areas which he believes could be cheaper and more satisfactory to staff needs than commercial organisations.

Having been a lay preacher for more than 35 years Dr Muncey is thinking about another change in his formal education—his retirement gives him the opportunity of possibly studying for a degree in divinity.



Dr Roy Muncey (left) and Paul Dubout, leader of the Acoustics Group, examine a sound-level meter in the 'dead room' at the Division of Building Research.

Leading centre

The man who developed the Division of Chemical Physics from a small section within the Division of Industrial Chemistry to one of the world's leading research centres in this field has retired from CSIRO.

He is Dr Lloyd Rees who in 1958 became the Division's Foundation Chief.

In a recent tribute, the President of The Royal Society, Lord Todd, said he believed Dr Rees had done more than anyone else to establish Australia as a force on the international scientific scene.

In 1944, Sir Ian Wark, Chief of the Division of Industrial Chemistry, asked Dr Rees to return from the UK to Australia to set up a Chemical Physics Section in the Division, the first chemical physics group to be set up in any government-financed laboratory in the world.

The function of the Section was to meet the urgent demand for the introduction into Australia of a number of major chemico-physical methods including electron-microscopy, electron diffraction, X-ray structure analysis, mass spectroscopy and infrared spectroscopy.

A chemist by training and a physicist by inclination and adoption, Lloyd Rees was the ideal man for the job.

In 1958 the Section that he had built up became the Division of Chemical Physics with Dr Rees as its Chief.

A firm believer that the best way to help industry is through fundamental scientific research, Dr Rees has seen many of his Division's inventions and techniques become commercially viable, not the least of which is the atomic absorption spectrophotometer.

Active in the affairs of both national and international scientific organisations, in 1969 Dr Rees became the only Australian to be elected president of the International Union of Pure and Applied Chemistry, the largest of all international scientific unions. He held the post until 1972.

Dr Rees was awarded a CBE in 1977 'for services to the science of chemical physics.'

As a measure of the esteem in which he is held, Dr Rees' portrait will hang alongside that of Sir David Rivett at the Division.

Beyond the field of science he was active in another area—he was an excellent cricketer and regularly made a century at the annual cricket match between Fishermen's Bend and Tribophysics in the 50s and 60s.

Dr Lloyd Rees and his wife Marion look at a presentation book of photographs showing highlights of Dr Rees' career.

Award

An honorary doctorate of science has been conferred on Dr D.F. Waterhouse, Chief, Division of Entomology, by the Australian National University for his 'distinguished creative achievements as a scholar'.

AMS appointment

Dr J. Gani, Chief of the Division of Mathematics and Statistics in Canberra, has been elected President of the Australian Mathematical Society for 1978-79.

Dr Gani is a founder member of the Society which was established in 1956. It now has a membership of 700, and publishes three scholarly journals and a less formal Gazette.

Obituary

Senior administrative officer dies

Mr John Warwick, Assistant Secretary (Administrative Services) since 1975, died in hospital in Canberra in May following a serious operation.

John originally joined the Organization as a clerical assistant in Sydney in 1951. In 1957 he resigned to become a school teacher.

Before rejoining the Organization in 1960 as an administrative officer at the Coastal Plains Research Station at Darwin, he completed a Bachelor of Arts degree. Later he worked at Armidale, then joined Head Office.

Appreciation

Ruth, Jenny, Ian and Linda Warwick wish to express their thanks to the many members of CSIRO's staff who sent messages of sympathy to the family at the time of John Warwick's death.

John spent 10 years working on and latterly directing the development of terms and conditions of employment and arbitration matters. Then, when he was promoted to his last position, he developed a cohesive administrative services activity, embracing systems development activities and services functions in Head Office and the RAOs.

This proved to be a niche he probably enjoyed more than anything else he had undertaken.

Never one for the hasty or ad hoc solution, he preferred to analyse all the options—usually in a smoke-filled room which occasionally had to be vacated while someone put out the wastepaper bin fire, lit by flying ash from a very active pipe.

When all the parties to a problem thought they had reached a consensus, John would often illuminate a dark, unexplored corner of the problem and bring a new perspective to it, usually following a heavy late night session.

As a manager, John's approach was also characterised by humanism. He took a personal interest in all the staff who came under his control and did much to ensure that their needs for fulfilment in work were met to the extent that this was within his powers.

As well as being a tireless worker, both on the job and in various community interests, John also had a great capacity to enjoy and get the most out of life.

He was always the first one to take his shoes off and start the dancing at a party—literally. He usually became aware of the latest funny story before anyone else, and had a great talent for retailing anecdotes.

He is survived by his wife Ruth, and three children, Jenny, Ian and Linda.

Frank Tighe retires after 31 years

Frank Tighe, DAO at the Division of Atmospheric Physics, has retired after 31 years service with CSIRO.

Frank first joined the Organization as a clerk in 1947, transferring to the Section of Meteorological Physics (as it was then) in 1951.

He is well able to recall the early days when the Division numbered a handful of scientists, and was temporarily housed in 'borrowed' wooden buildings at Highett on the site of the present Division of Building Research.

The move to a permanent location at Aspendale heralded busy years of growth in the 1950s and a spate of extended field expeditions in the early 60s. Despite this activity, Frank was bent on acquiring a degree and later was awarded a BA from the University of Melbourne.

Throughout his time with the Division, he was known for his ability to keep his cool during times of crisis.

However, he will best be remembered for his interest in people and their problems.

To mark the occasion of his retirement, a well attended farewell dinner was held for him at a local hostelry.

He leaves with the Division's warmest wishes.

No increase in Benevolent Funds rate warranted

The income of all the CSIRO Benevolent Funds exceeded expenditure for 1977 although in all but one Fund expenditure rose during the year.

It was agreed at the annual general meeting of the Funds in Canberra that there would be no increase in contribution rates as the combined assets of the Funds were over $60 000.

In their fifth annual report, the Chairmen of the Funds recorded their thanks and appreciation to Mr M.Puttock, NML, for his guidance and council over the past years. Mr Puttock retires this year from the Chairmanship of the NSW Fund, having played an active role in it for many years.

Finance

The financial situation of each of the Funds is shown below. Figures in brackets are for 1976.

Income and Expenditure

Fund	Income $		Expenditure $	
Brisbane	2636	(1724)	1540	(1718)
NSW	5871	(6020)	2592	(2321)
Canberra	3654	(3866)	2262	(1309)
Southern	7403	(7209)	4880	(4509)

Assets

Fund	Investments and cash $		Outstanding loans $	
Brisbane	8499	(7403)	315	(315)
NSW	21 150	(17 870)	458	(610)
Canberra	14 061	(12 668)	2214	(1524)
Southern	18 479	(15 966)	Nil	(Nil)
	62 189	(53 970)	2987	(2449)

This is it... NML's 'funnel' installed

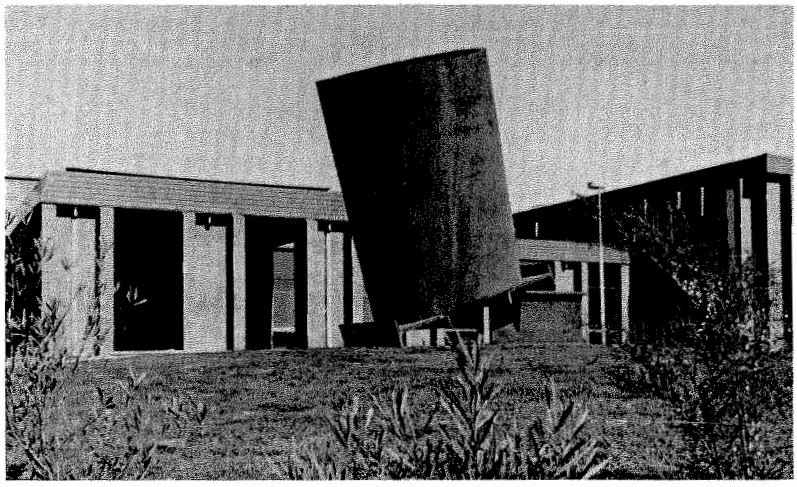


Photo: Harry Gillett

Joint symposium for Divisions

The Divisions of Food Research in Sydney and Human Nutrition in Adelaide recently held a joint symposium at North Ryde when topics which are of interest to both groups of researchers were discussed.

The symposium grew out of a realisation that the two Divisions had many areas of common interest in their research programs. At the end of last year the Chiefs and Assistant Chiefs of both Divisions agreed that it was desirable to exchange information and to establish co-operative research projects.

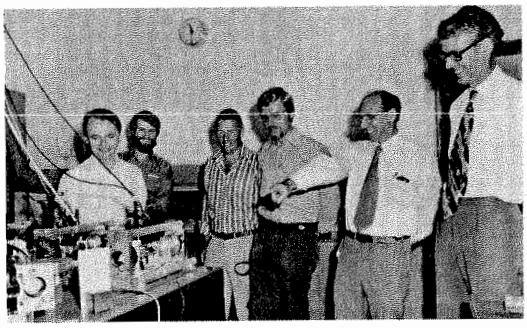
The symposium, which was also attended by people outside the Organization, started with a description of a project which already involved active collaboration between the scientists, namely the effects of dietary fibre and saponins on bile salt excretion and serum cholesterol.

Other topics presented were studies on zinc and iodine deficiency, biotin in nutrition, 3-methylhistidine as an indicator of muscle protein, gut microflora, linoleic acid-enriched ruminant foodstuffs and the use of isolated liver cells in studies of carcinoma.

Among the participants were Professor A.S. Truswell, Professor of Human Nutrition, Sydney University; Professor M.Wahlqvist, Professor of Human Nutrition, Deakin University; Professor F. Annison and Dr D.Balnave of the Department of Animal Husbandry, University of Sydney; Dr I. Hanson, University of Western Australia, as well as about 20 scientists from CSIRO.

The day finished with a 'restorative collation' in the Laboratory's canteen which further helped to cement cordial relationship between the two Divisions.

Overseas visitor for NML



Surprise and envy at the extent and quality of NML's optical production capability were expressed by Mr Eckhard Potulski, an engineer from the Physikalisch-Technichse Bundesanstalt, Braunschweig, West Germany, when he visited NML. Mr Potulsky works in the fields of wavelength measurement and end-standard interferometry and he was able to report on the latest developments in interferometry at PTB.

From left to right are Z.Hegedus, N. Brown, E. Potulski, D. Roehrbein, P.E. Ciddor and W.H. Steel.

Change of scene

Bob Marshall, staff development officer at Head Office, has been appointed acting personnel officer at the RAO in Canberra for a period of six months.

Bob is well-known in the CSIRO laboratories throughout Australia, having conducted management courses for many of the staff.

Fun run in Canberra

The second annual CSIRO Fun Run for 'The Black Mountain Cup' will be held on Wednesday 19 July in Canberra.

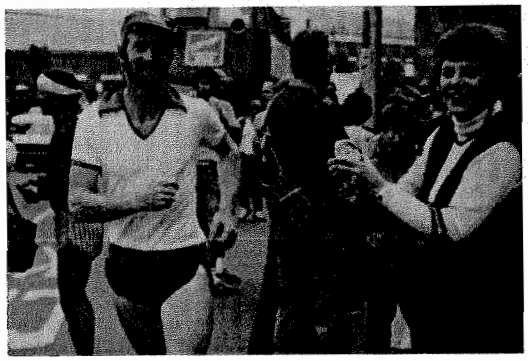
It will start in the Environmental Mechanics car park at 12.45 pm, and cover the same 5.6 km course as last year.

Entomology cleaned up the event last year taking the teams (lowest total time of any four runners) and outright honours.

Surely someone else can get in on the act this year, or, if you're not the competitive type it's great lunchtime entertainment.

For further information contact: Col Hazelton 46 5891

CAA 'Walk against Want'



When Community Aid Abroad held its 'Walk against Want' in Melbourne a number of CSIRO staff members took part.

With the generous backing from many Divisions, they raised $800.

Knowing his ability as a runner, the sponsors of Kevin Green (CSIRO archivist) backed him on the basis of time taken rather than distance covered. He completed the 20km in 107 minutes.

Those taking part were Irving Chin, Janet Young, Sue Blakely and Kevin Green who represented CILES, and from the Division of Mineral Chemistry came Robin Arnold, Harry Gardiner, Mike Wedsley and Hari Sinha.

Pictured above are Kevin Green and Judith Stump (Central Library).

Unused equipment

In order to make the best use of little used or unused equipment within the Organization, staff are advised that their Regional Administrative Offices have the facilities, through their maintenance of the Organization's Assets Registers, to help them in seeking a loan or transfer of equipment.

Sort of soil flavoured and chewey...

The earthworm booklet produced by the Division of Soils in Adelaide is proving to be a best seller among Australian gardeners—and gourmets.

The second edition contained some recipes for cooking the friendly worms. This resulted in author Kevin Handrek making a guest appearance on the Mike Walsh Show in Sydney.

Someone had to cook the worms so Kevin enlisted the support of Wendy Hill, a temporary switchboard operator at the Division.

Mike Walsh managed to down one of the tasty tidbits while the bandleader feigned sudden illness on eating the juicy omelette.

Meanwhile back in Perth the deft hand of that well known culinary expert at Land Resources Management, Justin Murphy, could be seen on the ABC's program This Day Tonight. The producers of TDT were so impressed by the book's gourmet section that they too, decided to publicly cook the earthworms.

The Division had to organise an earthworm search—not easy after three summers' drought. Having found sufficient numbers, the participants, with a State-wide audience of thousands of squeamish people, proceeded to concoct a wriggling omelette. Plenty of close-ups of the earthy ingredients were included.

A reporter nearly didn't make it to the end of the program and only stopped short of disgracing herself by occasionally closing her eyes and thinking of chocolate and French champagne.

The intrepid studio crew, brave to the last, and ravenous after a long shift behind cameras and microphones, was prepared to try them and pronounced the creation as...excellent.

Asked to comment on what they really taste like, the expert, Kevin Handrek says: 'Not too bad. Sort of a eucalyptus and soil flavour. And chewey!'

'Coresearch'

'Coresearch' is produced by the Central Communication Unit for CSIRO staff. It is also circulated to some people outside the Organization who have a professional interest in CSIRO activities.

Members are invited to contribute or send suggestions for articles. The deadline for material is normally the first day of the month preceding publication.

Material and queries should be sent to the Editor, Box 225, Dickson, A.C.T. 2602, Tel. 48 4476

Editor: Dorothy Braxton
Assistant Editor: Barbara Hartley

CoResearch

A publication for CSIRO staff Aug/Sept 1978

223 222

Budget : Another no-growth year ahead

Staff ceiling cut by 50

CSIRO staff ceilings will be reduced by 51 positions to a maximum of 5700 as a result of the Federal Budget.

The reductions, which will be achieved by natural wastage—retirements and resignations—relate only to those positions funded by CSIRO's allocation from the Federal Budget.

It does not take into account any current or future staff cuts resulting from a reduction in industry funds for research, and still leaves open the possibility that staff ceilings may be further adjusted by the Government before the next Budget.

Chiefs of Divisions have already been notified of the new staff ceilings, which must be achieved by the end of June 1979.

In general the 51 positions will be lost by Divisions and Head Office on a pro-rata basis according to size, with a maximum loss of three positions in any one Division.

However, the Executive has made some adjustment to the pro-rata formula to ensure high priority research areas are appropriately supported.

The ceiling figure of 5700 staff funded by the Budget includes a figure of 40 casual positions for seasonal work or other similar purposes.

Overall, the 1978/79 Budget means a slight contraction in total research activity and some re-deployment of staff or positions.

The Budget provided $144 344 000 to CSIRO, comprising $141 244 000 for salaries and operational activities and $3 100 000 for major items of equipment, minor buildings, works and developmental expenditure.

While CSIRO's appropriation represents a nominal increase of 6.6 per cent over last year's figure, the increase from the viewpoint of existing activities is only five per cent.

Several factors tend to obscure the real nature of the increase in CSIRO's Budget allocation:

. Changed funding arrangements from 1 January 1978 for CSIRO's sheep and wool research, where the Government has directly provided CSIRO with funds for 60 per cent of the research previously funded from the Wool Research Trust Fund. This means an increase of $4.4 million in CSIRO's 1978/79 appropriation over 1977/78.

. The transfer to CSIRO in September 1977 of the Adelaide branch, Department of Defence's Material Research Laboratory. Additional funds of $301 000 have been provided to meet the cost of a full year's operation.

The Government's decision to allocate $656 000 to CSIRO to provide additional research support for the Department of Primary Industry in its role of monitoring and managing the resources of the 200 nautical mile Australian Fishing Zone.

Additionally, in accordance with the Government's decision on the recommendations of the Independent Inquiry, that the CSIRO Budget should not be used as a channel for Government contributions to the Standards Association of Australia and the National Association of Testing Authorities, $2 711 000 which in the past would have been included in CSIRO's Budget for 1978/79, will instead be channelled through the Department of Science.

In commenting on CSIRO's Budget allocation, the Minister for Science, Senator J.J. Webster, said there would be a redeployment into the following areas of national importance:

. Fisheries research, in support of the management and monitoring of resources of the Australian fishing zone by Primary Industry.

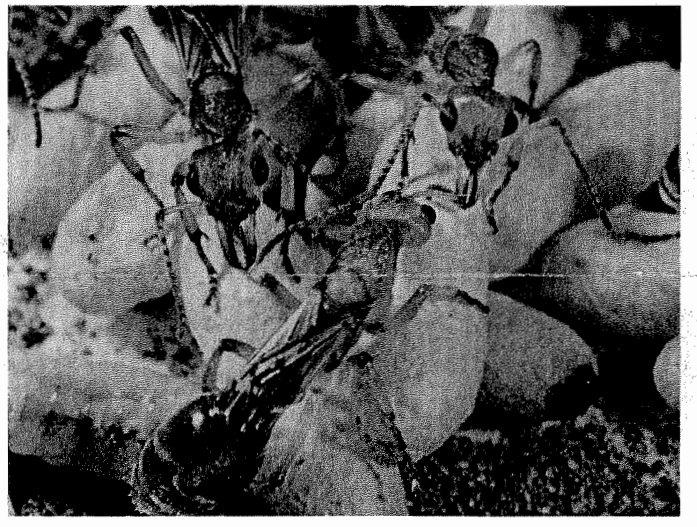
. Breeding aphid-resistant lucerne to combat the threat to Australia's lucerne crops by exotic aphids.

. Investigations into the link between insects and the livestock disease bluetongue in Australia.

. Planning and documentation of the Australian National Animal Health Laboratory now being built at Geelong, Vic.

. Establishing an international research co-operation group to generally co-ordinate CSIRO's research assistance for developing countries.

A year ago, this photograph would have been an entomologist's dream. The world's most primitive living ant, Nothomyrmecia macrops, *still remained elusive after a 40-year quest which followed the discovery of two specimens by an amateur naturalist. Rediscovered by Division of Entomology ant specialist Dr Bob Taylor in South Australia last year, these living fossils are now thriving under laboratory conditions. This photograph, by Peter Hay, shows a worker attending two young queens, with pupae and a hatched larva. Only the worker caste had been described previously.*



New Chief appointed for Irrigation Research

Division will retain autonomy

The Division of Irrigation Research at Griffith has a new Chief—plant physiologist Dr Paul Kriedemann, currently a Senior Principal Research Scientist working at the Merbein laboratory of the Division of Horticultural Research.

Dr Kriedemann's appointment was announced in July, and he will take up his new position in October.

He replaces the Division's acting Chief, Dr Henry Barrs, who has guided research at Griffith since the retirement of Mr Eric Hoare more than a year ago.

In announcing Dr Kriedemann's appointment to the Division's staff, Executive Member Dr Alan Pierce, said the move reflected the Executive's view that CSIRO needed a Division to deal with the problems of intensive production under irrigated conditions, and that the Division would need to develop stronger links with other research groups because of its relatively small size but multi-disciplinary nature.

Dr Pierce paid tribute to Dr Barrs for his able and expert guidance of the Division during his caretaker period, and thanked staff members for their co-operation during what he described as 'a very trying time'.

This period had extended from the initiation by the Executive of an independent review by the Fowden Committee in December 1976, in preparation for Mr Hoare's retirement, until the present.

During this period, the Executive's first policy decision was that CSIRO would retain a research group at Griffith.

However, it was not until organisational aspects had been looked at in more detail that the Executive decided in December 1977 that the group would continue to have free-standing Divisional status, rather than being combined with another Division.

Dr Pierce described Dr Kriedemann as the outstanding applicant in a splendid field of applicants, and one who exactly matched the requirements for Chief of the Division as defined by the Fowden Committee.

He had graduated B.Agr.Sc. (Hons) from Queensland University in 1960 and was awarded his Ph.D. by the University of Melbourne in 1964 for research on crop physiology.

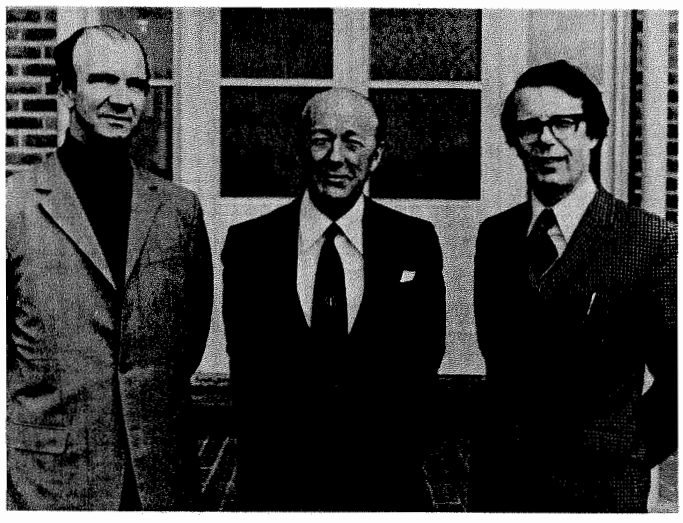
Between 1964 and 1966 he held a post-doctoral fellowship with the Department of Biological Sciences at Purdue University in the US, and upon returning to Australia in 1966 he joined the Division of Horticultural Research at Merbein.

Author of more than 50 publications, Dr Kriedemann at 41 had already gained an international reputation in plant physiology.

Dr Pierce, referring to the announcement in December that Irrigation Research's scope would be widened to include specific studies into soils and water management, said the Executive hoped, despite general cutbacks and restrictions for CSIRO as a whole, to provide additional resources to start the Division off on its new course.

'The Executive has every confidence in the future of the Division, in Paul's ability to lead it effectively and imaginatively, and in the support he can expect from his staff,' Dr Pierce said.

From left, new Chief Dr Paul Kriedemann, Executive Member Dr Alan Pierce and former Acting Chief, Dr Henry Barrs.



a/COR

Editorial

New times, new look for CoResearch

CoResearch comes to you this month with some changes in appearance and content, the result of a change in editor (see this page) and a re-working by David Marshall of the Central Communication Unit's graphic design section.

Over the years, CoResearch has evolved with CSIRO, and the changes to this issue reflect a reappraisal of the magazine at a time of fundamental change in the Organization.

CoResearch has always sought to inform and entertain, but underlying these two aims has been the more basic objective of fostering a sense of community in a diverse and highly dispersed organisation.

The 'them-us' syndrome occurs in any large organisation, and is accentuated in decentralised bodies such as CSIRO. Add to this the inevitable tensions associated with rapid change and financial stringency and the need for mechanisms to maintain a sense of unity becomes urgent.

CoResearch needs to reflect the fact that we work for *one* organisation, and that we should know what goes on it it, whether it affects us directly or not.

CoResearch has always been a staff journal, and will continue in this role.

CoResearch would like to encourage all staff to become interested in science, which ultimately employs us all. Science needs advocates in Australia, and we have more than 6000 potential advocates within the Organization.

CSIRO employs some of the best minds in Australia, both in research and administration. Through the new feature 'Perspective' CoResearch hopes to become a forum for people to contribute to, or bring perspective to internal or public debate, within the guidelines set down for public statements by CSIRO staff.

If there are enough contributors, either voluntary or by invitation, 'Perspective' will carry state-of-the-art features, expert views on topical issues and perhaps an occasional exercise in crystal ball gazing.

CoResearch would like to hear about the leisure interests of CSIRO staff—painting, pottery, poetry, hang-gliding, gardening or any other pursuit which might interest others, particularly those looking to enrich the years after retirement.

Science and its administration tend to be deadly serious matters, and CoResearch will publish the occasional cartoon—borrowed or contributed by staff—to leaven the heavier material, while continuing its 'Science at Work' photographs.

CoResearch welcomes other people's ideas on how it can be improved, and will continue to seek contributions from all Divisions—articles, suggestions for articles, and photographs.

Photographers are invited to contribute pictures illustrating research as well as people, and both preference and due credit will be given to imaginative shots—given that this is not always possible for some subjects.

The correspondence column seeks brief, pithy or witty views from staff. For a start how about something effusive or abusive about this issue?

. . . and a new editor

There has been a change in the editorship of CoResearch. Dorothy Braxton, who has been in the editorial chair for the past 5½ years, had handed over to Graeme O'Neill, formerly of the Media Group.

After putting her final edition 'to bed', Dorothy claimed that editing CoResearch had been one of the most difficult tasks she had undertaken in a long career in journalism.

This was because she found she had to cater for a very wide range of people living across a huge expanse of country and somehow satisfy the interests of all of them—in four pages.

'CoResearch is not for any one particular group of people,' she said. 'It belongs to the scientists, the typists and secretaries, the tea ladies, administrators, laboratory craftsmen, engineers and technical staff.

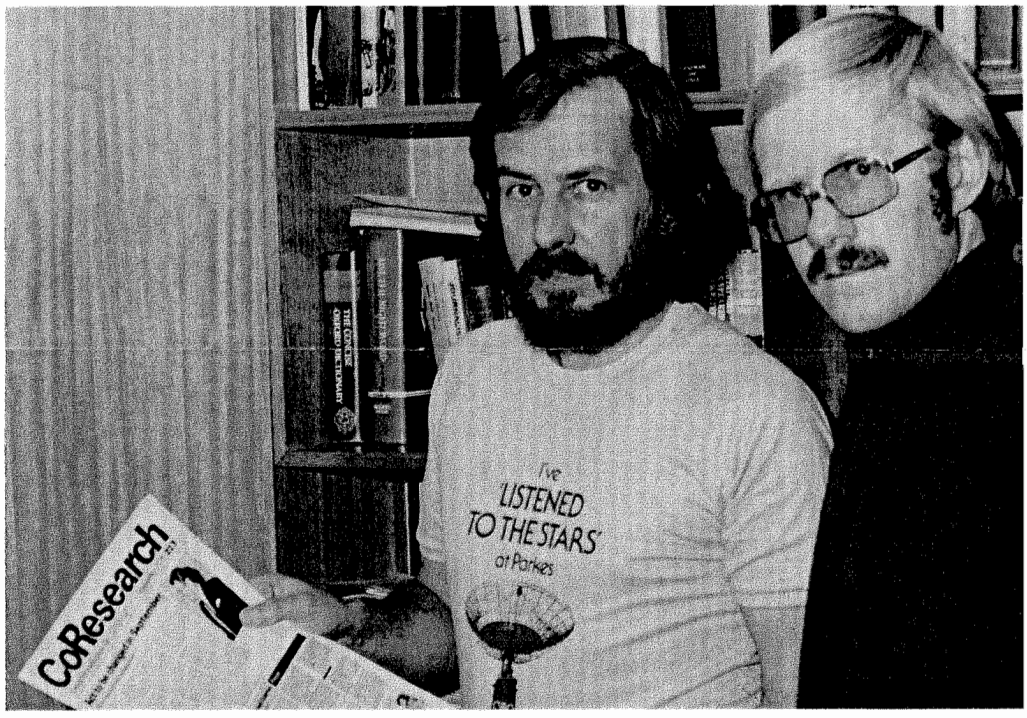
'Some want it produced like "The Times", others the "Financial Review", while others again see it as being anything from "Truth" to "Nature".

'The best part about being editor has been meeting so many people.

'I've had tremendous co-operation from Divisional staff, especially photographers and those in the communication game and I'd like to thank them for that help.'

Graeme O'Neill, the new editor, spent 3½ years with the Media Group and will be known to many Divisional staff already.

At 30, he has had 14 years in journalism, both as a writer and sub-editor.



David Marshall, Chief Graphic Designer with the Central Communication Unit, discusses the new format for CoResearch with new editor Graeme O'Neill. David also designed the motif for the T-shirt, which will be sold from the Parkes radiotelescope visitors' centre.

CSIRO band recovered in China

Vital feather in scheme's cap

History was made in June when the CSIRO-administered Australian Bird-Banding Scheme received its first bird band back from the People's Republic of China.

The return of the band from a curlew sandpiper, *Calidris ferruginea*, may be a prelude to the recovery of more bands from China, which lies in the migratory path of a number of species in which the bird-banding scheme has an interest.

The recovery of band No 040-71148 from China has elated the scheme's Officer-in-Charge, Mr David Purchase, and his colleagues from the Division of Wildlife Research at Gungahlin.

Mr Purchase has been waiting a long time for the opportunity to place a coloured pin, representing a band recovery, inside the blank area of China on his large wall map of the world.

Pins in various colours already show band recoveries from most of the Pacific region and into Siberia, where many birds from a group known as the palaearctic waders breed.

In 1976 the Ambassador of the People's Republic of China, His Excellency Chou Chiu-Yeh, accepted an invitation to visit the Division of Wildlife Research at Gungahlin.

The opportunity was used to explain to Mr Chou the aims of the Australian Bird-Banding Scheme and the Scheme's wish to cooperate with the People's Republic of China in the study of migratory birds.

The growing cultural and trade exchange between Australia and China has now established a basis for scientific exchange between the two countries, and China recently announced it would welcome help from other countries in achieving a major upgrading of its scientific research effort.

The breakthrough for the bird-banding scheme came with the receipt at Gungahlin of a letter bearing a Chinese stamp and written in Chinese.

Translated, it was found to be from a worker named Wu Kuei-Ch'uan, a member of the No 10 production team in a rural commune in Kuangtung Province, not far from Canton.

Mr Wu said the curlew sandpiper had been caught in the fields along with several others. It was seriously injured, and he had attempted to nurse it back to health after finding the band on its leg. However, despite his efforts it had died.

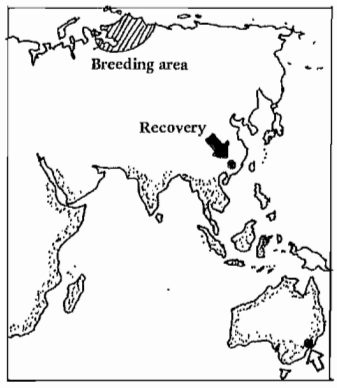
The bird was recovered on 14 May 1978, about 15 months after being banded on Kooragang Island near Newcastle NSW by Mr Frederick van Gessel.

Mr van Gessel, who operates under the auspices of the Australian Bird-Banding Scheme, is undertaking a study of the curlew sandpipers and other palaearctic waders which visit the Newcastle area.

The curlew sandpiper breeds in the Arctic regions of Siberia during the northern summer, and each autumn makes the long trip to southern latitudes to escape the bitter Siberian winter.

During the northern winter it is found along the coasts of Africa, India, south-east Asia and Australia.

The bird recovered in China was one of 2339 palaearctic waders banded by members of the Australian Bird-Banding Scheme in 1976-77.



Geomechanics work 'vital to industry'

Syndal's scientists show their wares

Representatives of Australian industry, Government, universities, colleges and research institutions responded enthusiastically to two special invitation days organised by the Division of Applied Geomechanics late in June.

More than 160 people visited the Division's Syndal laboratories near Melbourne to discuss fundamental and applied research relating to mining, civil and marine engineering.

Victorian Senator T.J.Tehan, deputising for the Minister for Science, Senator J.J.Webster, who was unavailable because of a Cabinet meeting, told 45 key senior people including the Chairman, Mr V.D. Burgmann, at the opening session that the Division had an outstanding record of collaborative research.

He said that among the Division's past accomplishments could be mentioned:

. the system of terrain evaluation for urban and regional planning that is now used by Australian consultants;
. improved application of underground metal mining techniques such as the use of post pillars and cable dowelling as methods of ground support;
. computer programs for the design of major raft foundations for large buildings;
. better methods for selecting foundations for minor buildings on troublesome expansive clays.

A current development was the use of geophysical techniques to provide warning of possible hazards in mines.

'There can be no doubt that the Division must continue to develop a national centre of excellence in geomechanics facilities', Senator Tehan said.

'A strong geomechanics research backup is critical to Australian development.

'In an energy conscious age the importance of efficient recovery of coal cannot be denied.

'There are urgent problems to be faced with the development of Australia's unique coastline and continental shelf, such as the management of foreshores as engineering development takes place.

'More knowledge is required about the nature and properties of the seabed materials on the continental shelf that must provide a firm foundation for petroleum and gas exploration and production platforms and pipelines,' Senator Tehan said.

Efficient recovery of ore and safety in underground metal mining was a continuing requirement.

In civil engineering new challenges had to be faced as rail transport systems were developed and more use was made of underground facilities, including future needs for underground storage of strategic materials.

The proper management of water resources required research into the stability of earth rockfill dams.

Drawing attention to the subject of so-called fundamental research, Senator Tehan said that the payoff from an apparently far-removed line of fundamental research could sometimes be spectacular—pure research in radio astronomy had led to the development of the aircraft landing system, Interscan, which would be worth millions of dollars to Australia.

'If one wants an example relevant to this occasion one need look no further than the hollow inclusion gauge developed by this Division to measure rock stress', he said.

'The cell is a considerable improvement on overseas techniques and relies for its operation on the simple elasticity principle first described by Hooke as long ago as 1676. The gauge is now being manufactured by an Australian firm under licence to CSIRO'.

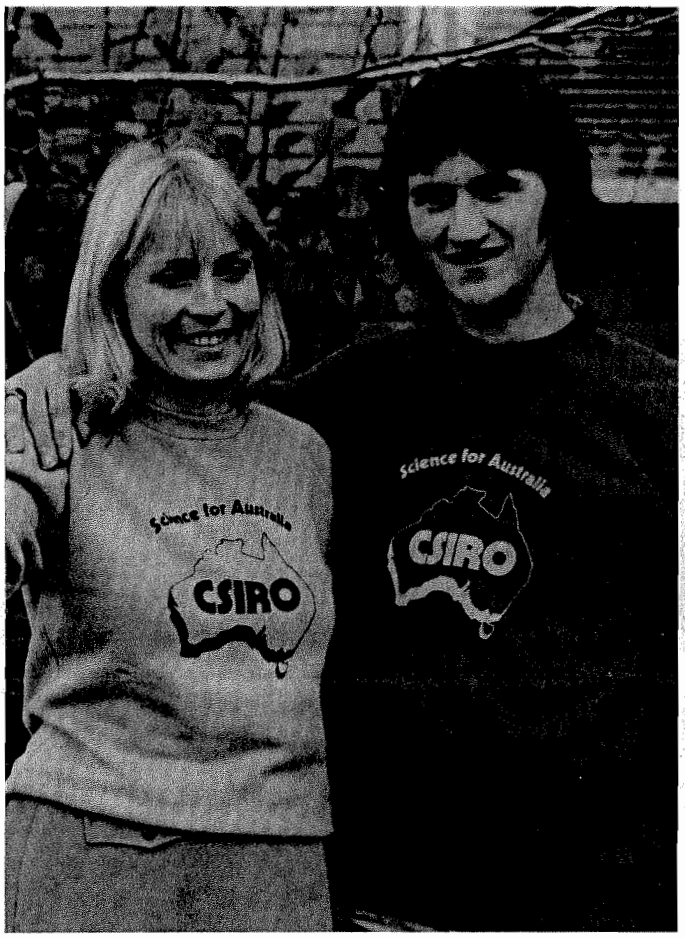
At each of the four sessions during the invitation days, guests were shown an audio-visual presentation of the Division's research activities, particularly those at field sites in various parts of Australia.

There were formal presentations and discussions in the laboratories of the Division's four programs, general geomechanics, metalliferous mining geotechnology, coal geotechnology, and urban, regional and marine technology, followed by free time for informal discussions and refreshments.

The Acting Chief of the Division, Dr Charles Gerrard, said it was the first time the Division had attempted to present an overview of all its activities.

'While it gave the Division an opportunity to present its message, we were very grateful to see it as a two-way communication exercise and we valued greatly the comments made by the visitors.

'Although we were concentrating to some extent on past and current achievements, we were also looking very much to the future and the research directions to be taken into the future', he said



Hennie Mitting and Gerry Mutsaerts of Textile Industry model the new windcheaters.

CSIRO windcheaters

Get it on your chest—with a T-shirt or windcheater from Textile Industry's Social Club.

Emblazoned with a map of Australia and the words 'CSIRO' and 'Science for Australia', the garments will help spread the CSIRO message and will generate funds for the club's charity activities.

They are available to anyone, and Divisional social clubs ordering in bulk are eligible for a discount.

The windcheaters are available in navy, royal blue, gold, maroon, bottle green, red and white, while T-shirts are available only in white, with blue motif.

Prices are: Windcheaters, boys and women, sizes 12-16, $10.50; men, sizes 16-22, $12. T-shirts, boys and women $4.50; men $5.

Women at work

Two different committees are currently taking a look at the employment of women in CSIRO. Each was independently set up towards the end of last year.

The establishment of the CSIRO committee was approved by the Executive and comprises Dr Judith Koch, of the Molecular and Cellular Biology Unit (Chairman), Dr Marjorie Jago, Division of Animal Health, Mr Don Gwynne, senior staff development officer at Head Office and Mr Arthur Blewitt, Divisional Secretary, Division of Entomology.

Members of the committee will be:

. examining the role of women in CSIRO;
. ascertaining the general attitude to the employment of women in CSIRO;
. reporting to the Executive on any perceived problems that might emerge as a result of the first two objectives.

The committee is planning to carry out a survey among the staff to discover attitudes about the employment of women. The survey questionnaire is being prepared in consultation with staff associations and staff at various Divisions. The committee will also be assisted in this by Dr Evan Davies, an industrial psychologist from the University of New South Wales who is an expert in such survey analyses.

Members of the committee would be pleased to have written submissions from any members of staff about the role of women in CSIRO, including matters relating to working conditions, for instance.

The CSIROOA has also established a committee to look at the employment of women in the Organization.

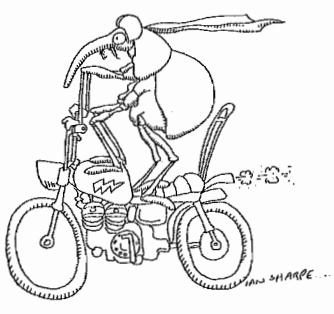
This committee, which comprises Dr Cecily Gribbin (Convener), Ms Lesley Instone, both of Building Research and Mrs Elizabeth Davy of CILES, will be examining several areas which are of special concern to the CSIROOA including:

. the formal Terms and Conditions of Employment of women in CSIRO with a view to advocating the removal of any discriminatory practices;
. the perceived consequences that have arisen from recent changes in terms and conditions of women in CSIRO with a view to establishing whether there are ways in which resultant problems can be minimised.

Both committees are interested in examining the attitudes of people in CSIRO to women in the workforce and the impact of such attitudes on recruitment and classification, and are cooperating in the preparation of the questionnaire.

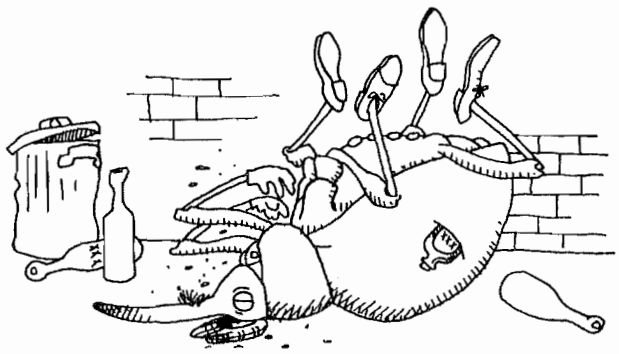
Keeping a Sharpe eye on weevils

When he's not drawing weevils, artist Ian Sharpe of the Division of Entomology relaxes by drawing weevils . . .



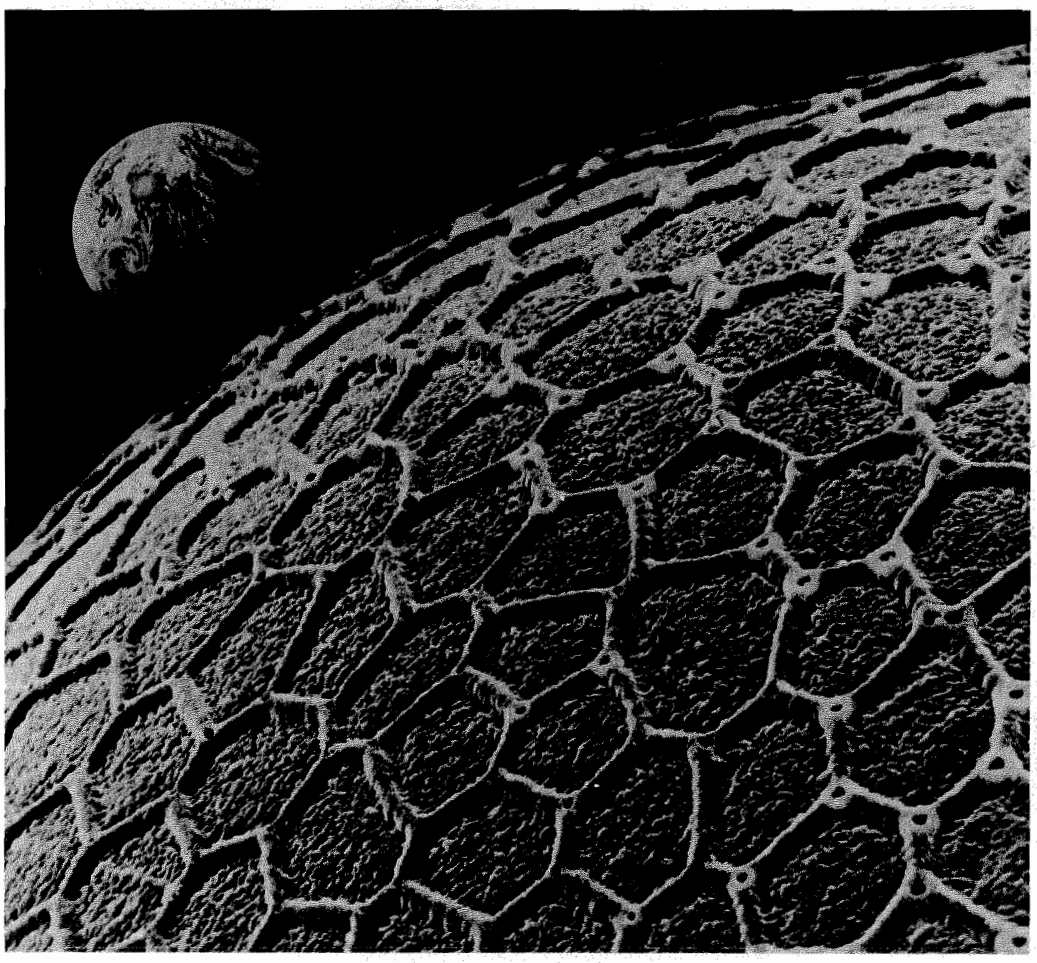
WEEVIL KNIEVEL

THE LESSER OF TWO WEEVILS



WEEVIL OVERCOME

Earthrise



Earthrise over the cratered landscape of a moth's egg. This remarkable montage is the work of electron microscopist Barry Filshie of the Division of Entomology in Canberra, who superimposed a 450X picture of an egg of a Pterolocera *moth, on a picture of the Earth from space (1/450 000 000th life size) taken by NASA. This picture begins a CoResearch series which will show how the electron microscope has revolutioned study of surface detail of minute objects.*

Exit an old bull, enter a CAT

New aircraft for Cloud Physics

The Division of Cloud Physics has traded in its old bull for a purring cat.

The familiar bellow of VH-RRA, the Division's venerable Douglas DC-3 research aircraft, has made way for the muted turbines of VH-CAT, a Fokker Friendship F27.

The 'new' Fokker, previously operated by the Department of Transport, was handed over to the Minister for Science, Senator J.J. Webster, at a ceremony at Sydney's Mascot Airport in July.

The Fokker will take part in nearly all the field programs of the Division of Cloud Physics.

It will enable the Division to take the important measurements in clouds to be seeded for rainmaking experiments in western Victoria next year.

The aircraft will be used to measure cloud properties relevant to verifying the action of the seeding material.

In other programs it will be used to collect aerosols—microscopic particles of matter in the atmosphere—from cities and industries as part of a long-term study aimed at finding whether, and to what degree, industrial pollution can affect weather or climate.

The Fokker will also be used in studies of mass scale phenomena over the oceans, and will be the platform from which measurements will be taken of the amount and character of the sun's radiation scattered from clouds.

Such information should allow the Division to obtain key information about cloud properties.

The DC-3 it supersedes has a colourful history—nothing unusual for this famous breed of aircraft.

Manufactured in 1944, VH-RRA was first used in cloud physics research in 1956, when it was operated by the RAAF Aircraft Research and Development Unit at Richmond, NSW.

Apart from a six-month period in 1962 when it underwent a major overhaul, the DC-3 continued to be used in cloud physics work until the end of 1964.

It was bought by CSIRO at the end of 1964 and was subsequently operated by East-West Airlines on the civil register, changing registration from A65-97 to the more familiar VH-RRA.

The aircraft has been used on a wide variety of research projects during its career with the RAAF and East-West Airlines.

The Minister for Science, Senator J.J. Webster, left, hands over the Fokker Friendship to Mr Jack Warner, Chief of the Division of Cloud Physics, watched by the Chairman, Mr Victor Burgmann, and Mr David Graham, Deputy Secretary (Air Operations) of the Department of Transport.

The odd par avian

'Dear Sir,' the letter said, 'Would you please send me more information about bird banging...'

That was just one of the gems to pass across the desk of Australian Bird Banding Scheme Secretary, David Purchase, in recent years.

One lacerated letter writer summed up his own recovery of a band perfectly when he wrote 'Holding a corella is like holding a chaff cutter.'

Others eschew frills and get right to the nub of it. With a band attached came this succinct letter: 'To the owner. One bird of your country came here last July 23. From the sender.'

The term 'bird banding' throws a lot of people. Mr Purchase has received letters referring to 'bird banking', 'bird banning', 'bird binding', and in a more horrific vein, 'bird bending' and 'bird branding'.

Perhaps the best was from a glue company, addressed to the Australian Bird Bonding Scheme.

From a wildlife warden whose efforts in recovering a shag alive and taking it to the security of his home had been rewarded by a copious expression of disdain upon his lounge room floor, came a letter addressed to 'The Chief S....r, CSIRO', which coined an indelicate new name for people displaying an unnatural interest in shags.

And from a remote valley in Victoria, came the following:

'Dear Sir,

I would like you to now that on this date one group ove crow, past our Farmer and the crow was hert and it fell neir were my Father was working and he looket close it it was dad and it saw this silve thing on it leg and he tooked it of and he brought it home. I readed and it said that I hefter writer to you. This what it said

Write-Wildlife-C.Siro
Canberra-Australia
Nur 100-46625

Yours faithfully
Miss X.'

The Report to Finder issued by the banding office was returned some time later with the following letter.

'Dear Sir,

I just got you letter this morning and I was pretty happy because I thought that my letter had got lost and I was gone sent you another one.

You wont to no if the Crow is DAD OR LIVE. well the Crow was dad and was foun in the.....Valley, Down Vic. We are grours we plant pears and patatoe and each year around February they came in a group around the place the master came from a long way and they eat our pear and evry pea grown they stater shoten at them when this crow was shot by my brother. and I riting for it because he cant ritter. Now he is the CROW BAND is there a prise for it If not wood you be good it nofer to sent a picture one a bird for my little sister.

You fathful.
Miss X.

If the letters themselves had the capacity to paralyse, the accompanying data form filled out by Miss X contained a lethal dose. In the personal details section she wrote:

Age: 17. Sex: No.

STOP PRESS: Mr Purchase has just received a letter addressed to 'The Australian Bird Boundry Scheme.' Not from the lunatic fringe, but from Head Office...

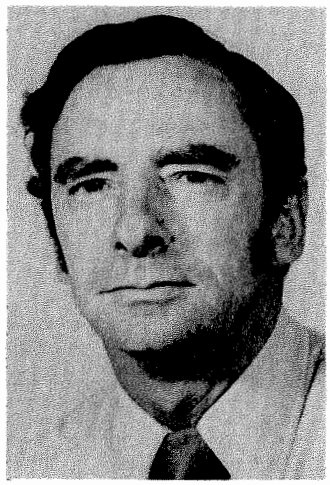
THE SECRETARY'S PRAYER

- Help me to have the memory of an elephant or at least one three years long.
- By some miracle let me do all things at once, answer four telephones at the same time and type a letter that must go today even though I know it won't be signed until tomorrow.
- Let me not lose patience when I search files for hours for a paper only to find it on the boss's desk.
- Give me the knowledge of a university professor with my school certificate education.
- Help me to understand and carry out all instructions without any instructions.
- Let me know without being told where the boss is, what he is doing, and when he will be back.

Slaying agriculture's Superweeds

Quest for selective sprays under way

The Division of Plant Industry celebrates its jubilee this year. Created as the CSIR Division of Economic Botany in 1928, the Division now enjoys a world reputation for its research. This feature looks at one of its projects.



Dr M.D. (Hal) Hatch

In the early 1960s two Australian plant biologists, Dr Hal Hatch and Dr Roger Slack, wrote a now classic scientific paper in which they confirmed the suspected existence of a different, more efficient system of photosynthesis in certain plants. They went on to study the so-called 'C4 photosynthesis pathway' in detail, showing how it differed greatly from the more common C3 pathway employed by the majority of the world's plants. From these basic studies may come a method of countering those C4 plants whose wayward vigour has made them the world's worst weeds.

A recently-assembled rogues' gallery of the world's worst weed pests produced a ranking in which eight of the 10 worst weeds were species employing the C4 photosynthesis pathway.

Only a minority of the world's plants are C4 species, and a similar balance is found in plants classed as weeds—so the disproportionate number of C4 weeds at the top of the world list is obviously due to more than mere chance.

The explanation lies in the fact that C4 plants as a group are more vigorous and tougher than the average C3 plant—in short, they have a greater potential for becoming weeds.

Some C4 species such as maize and sugar cane are cultivated as crops, but most of our cereal, fruit and vegetable crops are C3 plants which are often unequally matched in competition against invading C4 weeds.

The result is greater expense in food production or lowered production levels because of weed contamination. The problem is accentuated in the underdeveloped countries of the tropics and sub-tropics where C4 weeds are more abundant and the funds and equipment for controlling them are in short supply.

Herbicides which selectively attack C4 weeds leaving C3 plants unharmed do exist, but they are few and expensive because of the enormous cost of developing them with trial-and-error methods. Some are also toxic to other life forms and pose long-term hazards to the environment.

A new approach is needed, and Dr Hal Hatch of the Division of Plant Industry believes the key lies in the unique photosynthesis pathway employed by C4 plants—the very basis of their often extraordinary vigour.

Dr Hatch and his colleague Dr Roger Slack (now with DSIR, New Zealand) came to their now classic conclusion that some plants employed a different system of photosynthesis while they were studying sugar cane for Colonial Sugar Refineries (now CSR) in Queensland in the early 1960s.

Russian researchers studying maize and Hawaiian researchers studying sugar cane had provided earlier clues, but Dr Hatch and Dr Slack took the radical step of demonstrating the existence of a new pathway of photosynthesis.

Photosynthesis is the process used by plants to 'fix' in plant tissues the energy upon which all other life forms ultimately depend—the energy from sunlight.

The C4 and C3 pathways are similar in many respects, but differ in certain fundamental chemical reactions, according to Dr Hatch.

These differences hold the key to the high growth rates and greater tolerance of water stress of C4 plants.

Australians are familiar with some of the more notorious C4 weeds—nut grass, the world's worst weed, Johnson grass (wild sorghum), pigweed (Amaranthus) and the often prettily-flowered portulaca.

Many C4 plants are themselves crop species—sugar cane, maize, millet, sorghum and a variety of tropical pasture grasses, including the grazier's friend and greenkeeper's curse, paspalum. All Australia's saltbush species are C4 plants.

Rice growers in many parts of the world are plagued by the C4 weed barnyard grass, while soybeans, the world's most important protein crop, suffer from a variety of C4 weeds.

What makes the C4 plant different, and how did such differences arise?

Dr Hatch and his co-workers have provided answers to the first question, but the origin of C4 plants is a mystery.

The majority are tropical and sub-tropical species, suggesting they evolved in warmer climates, but a few are native to Britain and Scandinavia.

They do not like low temperatures and are generally not a problem in winter-growing crops. But in summer crops they can be rampant.

C4 plants are newcomers in an evolutionary timescale. Photosynthesis evolved in single-celled organisms about 2000 million years ago, while C4 plants appeared much more recently—possibly only during the last 50-60 million years.

Both C3 and C4 plant often occur in a single family, and many distinctly different plant families contain C4 species.

Obviously, there is no common ancestor for all C4 plants, and the genetic changes which produce C4 plants from C3 ancestors must have occurred quite independently on many separate occasions.

The reason for the 'sudden' appearance of many C4 species is not known, but Dr Hatch speculates that the evolution and proliferation of these species may have been favoured by an environment quite different to that of today.

More abundant atmospheric oxygen combined with lower levels of carbon dioxide, required by plants for photosynthesis, and reduced water supply would all be factors favouring C4 plant evolution.

In the crucial first step of photosynthesis, carbon dioxide from the air is fixed in a chemical form that triggers a long sequence of reactions within the plant's leaf cells.

The carbon from carbon dioxide ultimately finishes up as the carbohydrate of plant sugars and starches and also proteins and lipids.

In C3 plants, this first chemical reaction cannot discriminate between oxygen and carbon dioxide, so that large amounts of oxygen that interfere with subsequent reactions find their way into the chemical pathway.

In C4 plants, a different primary reaction is involved in fixing carbon dioxide. The reaction is so efficient that it swamps any unwanted oxygen reactions.

All plants simultaneously 'inhale' carbon dioxide and 'exhale' water vapour via tiny pores in their leaves called stomata.

When water is scarce, plants must decrease the aperture of these pores or close them completely to conserve water, which means the vital flow of carbon dioxide into the leaf slows or stops.

With stomates fully open both C4 and C3 plants lose the same amount of water, but the C4 plant is able to inhale a greater amount of carbon dioxide because of its more efficient chemistry.

In conditions of water stress, C4 plants are able to continue taking in carbon dioxide when C3 plants have been forced to shut down completely to survive.

At higher temperatures, some C4 plants can get by with as little as a fifth of the water used by C3 plants, a big advantage where the two occur together, as in a C3 crop contaminated by C4 weeds.

Dr Hatch says there are two options for the development of C4 herbicides, based on the two basic types of activity occurring during photosynthesis.

These two activities are synthesis of chemical compounds by special 'factories' within the plant's cells, and the transport of the products of these processes between 'factories'.

One type of herbicide might interfere with synthesis, and the other with the transport reactions.

Research by Dr Hatch and his colleagues at the Division of Plant Industry has allowed them to duplicate most of the chemical reactions which are exclusive to the C4 pathway.

Now the team plans to test a range of compounds which may interfere with these reactions.

'We don't know how many compounds will work, but for example, hundreds could show some promise under laboratory conditions,' Dr Hatch said.

'We will then test them against C4 plants. Many will not work on living plants because they may not penetrate, or will be deactivated by other processes within the plants.

'Those which do work will then be tested against C3 plants. Again, many may prove unsuitable because they interfere with the C3 pathway in some unforeseen way. However, there appears to be a reasonable chance that some will prove harmless to C3 plants while being active against C4 plants.

'Even if there are many failures along the way, the prospects are still good.

'We can determine the basic structural features necessary for some of the more promising compounds to be active, and with the aid of organic chemists we can modify them into something a little different—variations on a theme.

'To date, the discovery of selective herbicides has usually involved the very expensive trial and error process of seeking compounds which worked, without any real understanding of how they worked.

'The interaction between herbicide and plant is something like a lock and key. With no knowledge of how the lock worked, people were forced to try many keys until they found some that opened it.

'With our basic studies of the C4 photosynthesis pathway, we now have a very good idea of how the lock works, and it's now a matter of designing keys to fit it.'

Dr Hatch believes the most promising avenue of research is to design chemical compounds which are similar to those made by the C4 plants themselves—analogues which will 'delude' the plant's normal processes with fatal results.

Success in any research program can never be guaranteed, but Dr Hatch is quietly optimistic that his years of basic research will yield something of enormous practical value—a weapon against superweeds.

Publicity unearths baby 'monster'

First live specimen of new insect family

Publicity in a Brisbane newspaper has resulted in the discovery of a live specimen of the so-called 'Cooloola Monster'.

The Monster, identified by CSIRO entomologist, Dr David Rentz earlier this year as representing a new family in the insect order Orthoptera, created considerable excitement when the first specimen, an adult male, was discovered in Queensland coastal rainforest.

It is the first addition at family level (see diagram) to the Orthoptera for more than a century.

The second specimen was found by a ranger who was digging in sandy heath on Fraser Island, which is adjacent to the site where Monster No. 1 was found.

His first spadeful of sandy soil uncovered a 1cm juvenile specimen of the Monster which, to his great credit, he recognised from the original CSIRO newspaper article despite differences in both size and appearance to the adult.

The circumstances of the discovery lend weight to the theory that the creature lives an entirely subterranean existence, perhaps surfacing only during soil waterlogging.

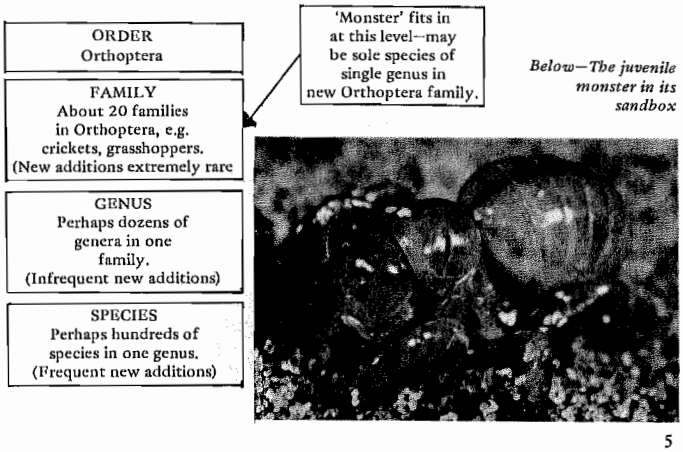
The ranger, after keeping it for some time in a bottle, sent it to Mr E.C.Dahms of the Queensland Museum, who had recognised the distinctiveness of the original specimen and sent it to Dr Rentz for identification.

Mr Dahms also sent the new specimen to Dr Rentz, who has kept it thriving on a diet of oatmeal, lettuce leaves and freshly-killed bushflies in a small container of its native soil.

Buffalo-profiled and strikingly muscled, both juvenile and adult Monster are superbly adapted for digging. From observations of the juvenile, they do not construct tunnels like their distant cricket relatives—instead they bore through the soil, allowing it to close behind them.

CSIRO, Queensland Museum and Queensland University entomologists are planning an expedition in October to try to find more specimens, in particular, a female—the juvenile's sex has not yet been determined.

WHERE THE 'MONSTER' FITS IN



Below—The juvenile monster in its sandbox

Space-age anvil for our wordsmiths

Electronic editing and retyping saves time

The blizzard of paperwork that daily swirls around Head Office's corridors is being brought under control by new technology.

The enormously time-consuming process of amending, redrafting and re-typing letters, reports and other paperwork is being short-circuited by the latest in electronic word processing.

Jobs which once took days can now be carried out in mere hours by an IBM Information Processor linked to an IBM Document Printer which can purr its way through a 700-word letter in less than a minute.

Behind the revolution is a member of Head Office's Administrative Systems Group, Kevin Howard, whose bold plan for modernising word processing was first conceived last year.

'Bold' is an appropriate term, because Kevin believes the way in which words are dictated, typed, amended, re-typed and printed has been quite archaic, having remained basically unchanged in CSIRO's 50-year history despite innovations such as the electric typewriter and photocopier.

Neither is the equipment cheap nor easy to operate—it requires preparatory and on-the-job training, as well as a high degree of initiative from its operators. It puts typing firmly into the computer age.

Some idea of the concept of word processing and its potential value can be gained from a rough description of how it works.

Typically, a letter or report is written or dictated, and the secretary types the first draft on a mag-card typewriter, which preserves the words and format in electronic form on the magnetic card.

The card goes to the Word Processing Centre while the written draft is circulated for comment/editing by other personnel.

The process of ensuring that everybody involved sees everybody else's comments can often entail redrafting and re-typing several times, but word processing truncates this procedure.

The Information Processor operator simply feeds in the mag-card (or a diskette where lengthy reports are involved) and can call up any line or any page within a few seconds.

The relevant paragraph can then be amended, deleted, or extended, with the Processor compensating automatically for changes, so line spacing, paragraph spacing and page numbering remain consistent.

The Information Processor then outputs the updated text onto fresh mag-cards together with printing instructions. These mag-cards are then batch-fed into the Ink Jet Printer.

The intelligence built into the Information Processor is also capable of limited file processing, and offers up to 97 fields of information on which specific information retrieval can be performed.

The Ink Jet Printer operates at phenomenal speed—up to 900 wpm for solid type, but more generally around 740 words where formats are more complex.

The speed is achieved via an ink-jet system, not the traditional percussion method of a typewriter. The letters are 'squirted' onto the paper in any one of four typestyles, with the ink-jet being guided in much the same way as electrons are guided onto a TV screen to form an image.

The printer automatically numbers pages, and prints 'heads' and 'tails' i.e., page titles and other references, automatically as well. It can also automatically number page lines or paragraphs.

Among its other talents, it can select different paper for the facing page of a report, for example, a letterhead, and it can also print an address on an envelope by selecting the address out of the letter itself.

The printer will accept up to 200 mag-cards, representing perhaps 50 jobs, and will work away unattended at night or on weekends.

If in any one job the print instructions contain an error, the printer will eject that particular job in which it occurred, issue notice of the error and provide the operator with a check list of possible solutions. Having done all this, the printer jumps to the next job ready for it, without operator involvement.

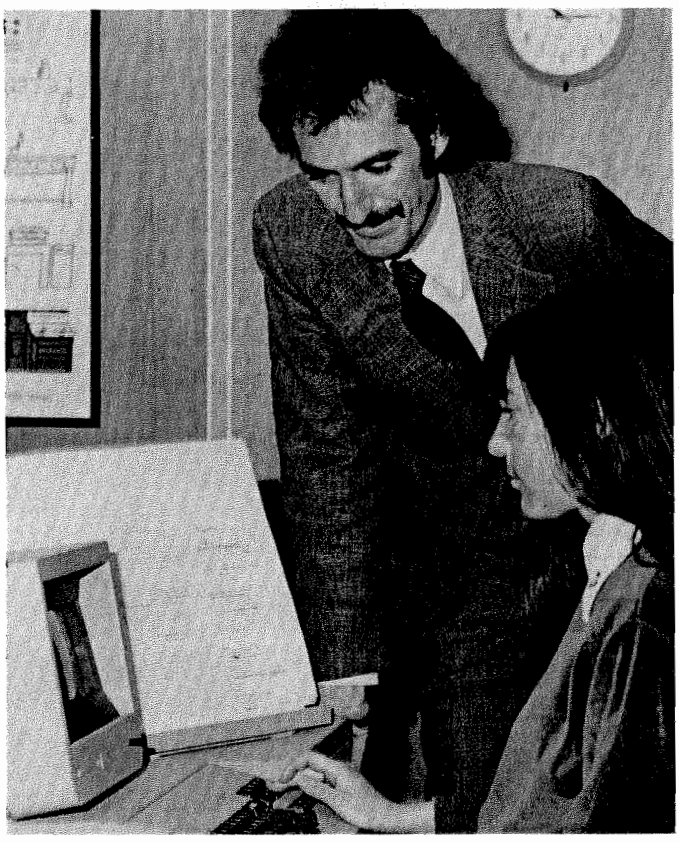
The printer can run as many copies as are required. Alternatively, the master copy of each job can be photocopied, or can serve as camera-ready copy for a conventional print run where many copies are required.

The whole remarkable system is operated by four remarkable people—Jo Howie, Angela Hughes, Pavla Staples and June Tracey.

Each was selected from Head Office secretarial staff for their exceptional skill with the mag-card typewriter, upon which the word processing system has developed.

A survey of secretarial typing staff in Head Office conducted late last year showed the average mag-card typewriter produced about 20 pages a day, with an upper figure of 30 pages a day.

In contrast, the average output for each of the four operators in the Word Processing Centre is consistently above 70 pages a day, with a high figure of 180 pages per day.



The wordprocessing group's leader, Kevin Howard, watches as Pavla Staples re-drafts a letter stored in the electronic editor's memory bank.

Among the Centre's achievements in its six months of operation:

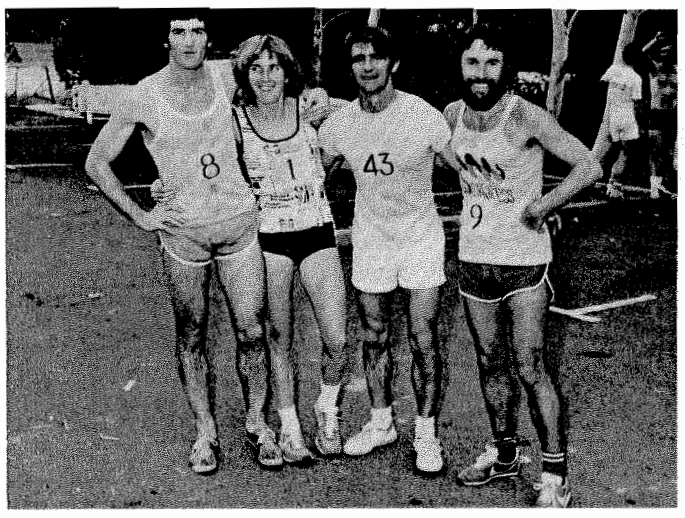
- a 180-page report was updated and printed within a day;
- a 56-page report redrafted by a committee during a morning was updated an and printed before the committee's afternoon session ended.

Mr Howard believes word processing centres could be established in CSIRO's major centres to handle repetitious correspondence, reports and scientific papers, and would like to hear from interested Divisions with word processing opportunities.

The Centre, now an established part of Head Office, attracts a growing stream of work which will see another Information Processor added soon, followed by possibly a third later this year.

'Word processing is revolutionising the way the printed word is put to paper in Head Office, and I think other parts of CSIRO will follow', Mr Howard said.

'I would stress that the savings in time which it makes possible do not threaten secretarial staff—it simply means they have much more time to concentrate on other important areas of work which offer greater job enjoyment. Typing something over and over again can be very boring work'.



Multi-hued knees flowered garishly in the chill of a late winter's day for the Canberra CSIRO Annual Fun Run in July.

Seventy runners ranging in fitness from dangerous to moribund, faced the starter, Dr John Philip, Chief of Environmental Mechanics.

Their years ranged from 18 to 55, although many aged visibly over the 5km course on Black Mountain.

When the dust had settled, Entomology's fliers had taken the Black Mountain Cup for the second year running. Their team comprised Kim Pullen (left), Rosemary Bell, John Feehan and Roger Farrow.

Rosemary Bell, last year's winner, is one of Australia's best-performed women distance runners. She came second this year to David Bagnall of Plant Industry, who recorded a time of 21.59.0, to Rosemary's 22.1.2.

Plant Industry was second in the Cup, followed by Environmental Mechanics.

Minister visits Highett

The Division of Mechanical Engineering at Highett, Melbourne, received not one but two visits from the Minister for Science, Senator J.J. Webster, in June.

On June 26 Senator Webster had discussions with the Chief, Barry Rawlings, Assistant Chief, John Kowalczewski, Mike Wooldridge and Wal Read.

Mr Read described the activities of the Solar Energy Studies Unit, which has now been transferred to the Division and renamed the Solar Engineering Unit with the retirement of its head, Mr Roger Morse.

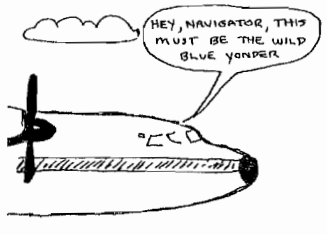
The Minister is shown inspecting the low energy consumption house built at Highett as a joint project with the Division of Building Research.

In the house, space and water heating is provided mainly by solar radiation, with orthodox energy consumption being further reduced by suitable selection of insulation, the house's orientation, shading and window location.

On his second visit four days later, Senator Webster had discussions with John Kowalczewski, Peter Taylor and Tom McDermott on current research in the Agricultural and Forestry Engineering section.

He was particularly interested in the funding and organisation of various development stages in physical methods of insect control in bulk grain, as well as in the Division's collaboration with industry and other CSIRO Divisions in agricultural and forestry engineering.

Senator Webster was shown a prototype system for disinfesting bulk grain by head treatment in a rapid continuous flow process, which might be employed at export terminals or country storages.



Interscan will go into the history books as a milestone for Australian science and technology, but if further proof were needed of the penetration of its success into the public consciousness, it came on the day the new development company Interscan Australia Pty Ltd was formed.

One of Australia's cryptic crossword clues on that day was 'Reins can't alter that new system helpful to aircraft navigation'—a very clever clue which not only provided an anagram for Interscan (reIns can't) but also highlighted one of the strengths of the new microwave landing system—its ability to penetrate rain without distortion.

People

New face on Executive

Dr J.Philip

The Chief of the Division of Environmental Mechanics, Dr J.R.Philip, has been appointed an Associate Member of the Executive.

Dr Philip's appointment is for six months from 1 August.

An applied mathematician specialising in environmental physics, Dr Philip has been Chief of Environmental Mechanics since the Division was founded in 1971.

He recently accepted an invitation to serve on the Science Advisory Committee of the Australian Broadcasting Commission.

Chemical Technology's Chief Stirrers, from top: Ron Maxted, David Lamble, Russell Elbers and Bob Shovelar, decided that they could do a better job than the mechanical stirrers which they were installing in components for a pilot plant to be assembled at Mirrabooka in Western Australia to clarify bore water for the Perth Water Board. The pilot plant will use the 'Sirofloc' process which has been developed at the Division of Chemical Technology by members of its Water and Wastewater Purification Research Program.

Mr Gratton Wilson has been formally appointed to the position of Secretary, CSIRO, by the Executive.

Mr Wilson has been acting in the position since the retirement of Dr J.A. Allen in 1976, when the position carried the title of Executive Officer.

He was recently honoured by his appointment as Chairman of the Australian National Commission for the United Nations Educational, Scientific and Cultural Organisation (UNESCO).

Dr Ray Toakley of the Division of Building Research has taken up an appointment to the Chair of Building in the University of New South Wales' Faculty of Architecture.

Dr Toakley, a specialist in structural design, joined CSIRO in 1968 and in the next decade gained an international reputation for his expertise in the construction industry.

In 1971 he was seconded for two years to the West Gate Bridge Authority as chief design engineer for the redesign of the bridge in the wake of its disastrous collapse.

He continued steel structure research after rejoining the Divison, and then became involved in studying low cost improvements to urban transport systems.

Dr Toakley is a member of the Australian Institute for Urban Studies, a Fellow of the Institution of Engineers, and a member of the Association for Computer Aided Design.

Dr R. Toakley

Mr A.McArthur

Mr Alan McArthur, the man largely responsible for developing Australia's bushfire warning systems has retired after 37 years in forestry.

In a long and distinguished career, Mr McArthur made his most outstanding contribution to Australian forestry through his work on fire control and use.

His work on the nature of bushfire behaviour and his practical application of that knowledge in his forest and grassland fire danger meters helped revolutionise bushfire control measures in Australia over the last decade.

The McArthur meters are now being adopted overseas.

Recently, the Institute of Foresters of Australia made Mr McArthur a Fellow of the Institute in recognition of his contribution to forestry.

Author of some 60 scientific papers on fire behaviour, fire effects and watershed management, Mr McArthur earlier this year co-authored the book 'Bushfires in Australia'.

Jack Chamberlain, manager of the CSIRO Printing Unit in Melbourne, retired in June.

Representatives from the Melbourne RAO, Divisions, the printing industry and some of Mr Chamberlain's retired colleagues attended the farewell function organised by staff of CILES.

CILES Officer-in-Charge, Mr Peter Judge, paid tribute to the fine quality printing, much of it distributed around the world, which was produced under Mr Chamberlain's management of the Unit.

Mr Chamberlain's contributions to CSIRO and the community were recognised with the award of a British Empire Medal in the Queens's Birthday Honours last year.

The Division of Environmental Mechanics is currently hosting two soil scientists under the Pye Fellowship scheme.

Professor Wilford R. Gardner, from the Environmental Physics Department, University of Wisconsin, on a 6 months' visit, is interested in irrigation and crop water use efficiency, movement of water and solutes in soils, and water and ion uptake by plants.

Dr Norman Morrow of the Petroleum Recovery Research Institute, New Mexico Institute of Mining and Technology, is on a 6 weeks' visit; his major research interests concern the structure and capillarity of fluids in porous media, and stability of interfaces.

Milton Jenkins, a senior laboratory craftsman at the National Measurement Laboratory, recently received a 'Pride of Workmanship' award from Lindfield Rotary Club.

Since joining NML in 1955, Mr Jenkins has been involved in many major projects, particularly in the construction of special purpose interferometers.

For the past three years he has been involved in constructing an absolute electrometer which will permit extremely precise measurement of the volt's absolute value.

Joy Bear of the Division of Mineral Chemistry, best known for her studies of petrichor, the piquant perfume of rain upon dry ground, has been awarded the Victorian Institute of Colleges' first doctorate by examination.

Dr Bear has been awarded the degree of Doctor of Applied Science for a thesis covering her published work on aspects of mineral chemistry and extractive metallurgy while working for the Division of Mineral Chemistry.

Examiners congratulated Dr Bear on her ability to achieve practical objectives through the development of an understanding of basic processes.

Dr J.Bear

Dr D.Weiss

Dr Don Weiss, Chief of the Division of Chemical Technology, has been awarded the Leighton Memorial Medal for 1978.

The medal is awarded by the Royal Australian Chemical Institute for eminent services to chemistry in Australia.

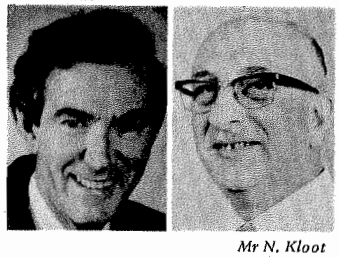
The citation by Dr L.W. Weickhardt, Chancellor of Melbourne University and 1968 Leighton Medallist, said Dr Weiss had achieved an international reputation for his research into adsorption and ion exchange technology and its application to the production of antibiotics and uranium, and in water purification.

In the latter field he was best known as the originator of the Sirotherm process for demineralising brackish water, which had been developed commercially in conjunction with Australian industry and was being taken up in several overseas countries.

The American Society of Plant Physiologists has accorded the status of Corresponding Member to Dr Lloyd Evans of the Division of Plant Industry.

Dr Evans, who retired this year as Chief of the Division to return to the research bench, was selected for his contributions to the science of plant physiology.

Dr L.Evans



Mr N. Kloot

One of Australia's leading wood scientists, Mr N.H. (Harry) Kloot, has retired after 44 years with CSIRO.

From his first position as a laboratory assistant with the old Division of Forest Products in Albert Street, Mr Kloot rose to become a Principal Research Scientist with the Division of Building Research.

During the war years, he headed an intensive program of specification testing of timber destined for use in military aircraft and other wartime projects.

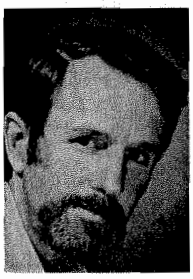
When the section resumed industry-oriented research into wood after the war, Mr Kloot played a major role in developing the idea of machine grading of timber in Australia using a more simple and cheaper concept than that used overseas.

He co-authored a handbook on timber engineering design which is now recognised internationally.

Perspective

A forum for comment by CSIRO individuals. Views expressed in this column do not necessarily reflect CSIRO official policy, and should be read only as a perspective on a subject of interest.

Smoking — a very clouded issue



Howard Crockford of the Division of Land Use Research in Canberra was formerly involved in CSIRO's tobacco research program at Mareeba in Queensland. He maintains a keen interest in tobacco and smoking, but is a non-smoker himself.

Nicotine is the most pharmacologically active constituent of tobacco and tobacco smoke. Its effects on a wide range of metabolic activities have been studied, and many of them have been shown to have harmful consequences to one degree or another.

As well as being addictive, nicotine also has the rather unique function of being simultaneously a relaxant and a mild mental stimulant. Therefore, along with the manipulative and sucking actions of smoking, it is not surprising that the habit is so popular and persistent.

Nicotine has been generally linked with tars as a dangerous substance and efforts have been made to reduce their levels in tobacco smoke. 'Tar' simply means the solid particles in the smoke and therefore always refers to smoke, not the tobacco itself.

Levels of nicotine and tars have been reduced during the last 10 years by filtration and blending of various tobacco types.

Recently I was asked to speak to the Commonwealth Department of Health concerning the percentage of nicotine and tars in tobacco as affected by agricultural practices.

At the Tobacco Research Institute at Mareeba, my colleagues and I conducted experiments that involved the manipulation of various cultural practices such as fertilisation, desuckering, deflowering and time of planting.

Tar levels proved remarkably resistant to the effects of changes while nicotine levels could be changed substantially.

Although this work could not continue due to the closure of the Institute in 1975, it had become clear that the deliberate manipulation of cultural practices in commercial tobacco growing were somewhat risky and beyond the skills of the normal grower.

A more practical method of producing lower nicotine tobacco is by breeding low nicotine lines, which has been done in America.

An apparently useful position had therefore been reached with regard to ultimately reducing nicotine levels. During the last two or three years however, the virtues of a low nicotine cigarette have come to be seen as doubtful.

It was found that smokers who switched to lower tar (with concommitant low nicotine) brands tended to smoke more of them in order to get their accustomed intake of nicotine.

As well, the flavour of cigarettes (to the smoker) is closely associated with tar levels—a further encouragement to smoke more cigarettes. With most smokers, however, their nicotine and tar intakes were still less than with their former brands.

It is unfortunate then that their vapour phase intake is increased. The vapour phase contains among other things carbon monoxide, a very harmful compound indeed.

Carbon monoxide is proposed as the cause of the increased incidence of cardiovascular disease among smokers of filter-tipped cigarettes (which yield substantially more carbon monoxide than unfiltered types).

Carbon monoxide is 'picked up' by the haemoglobin in blood about 150 times faster than oxygen.

To look at another aspect, it appears that a lower rate of lung cancer is evident among smokers of air cured tobacco. The evidence is derived from correlations over populations and has weaknesses normal to this type of exercise. The same claim has been made for cigar and pipe smoking—products also made from air cured leaf of different types, but smoked in a very different manner to cigarettes.

Of course it may induce other reactive anti-social behaviour in addicted smokers, and probably will not influence the young, many of whom start smoking as an act of rebellion. The basic fact is that we live in a drug taking society and quite substantial social changes must occur as a prerequisite to reduction in drug taking.

Most cigarettes smoked in Australia, UK and America are flue cured. The chemical and physical properties of flue and air cured tobacco are quite different and there is room here for further experimentation.

Recently it has been suggested that a safer cigarette might be one with a low tar yield but a higher rather than lower nicotine content, the reason being that smokers which switch to low tar, low nicotine brands, tend to smoke more cigarettes, thereby increasing their intake of carbon monoxide.

Nicotine can easily be added to tobacco during cigarette manufacture. In Israel, for example, lettuce leaf is used as a tobacco substitute with added nicotine.

Other tobacco substitutes have been introduced into cigarette tobacco blends in the UK such as Cytrel and New Smoking Material. The nicotine content is of course made up to requirements, but these substitutes have not been a success.

Opting for higher nicotine content of low tar cigarettes assumes that nicotine is less harmful than tars or components of the vapour phase, and this may be true. It might be 20 years or more though before firm trends in health consequences become obvious.

Up to now anti-smoking campaigns have had limited success. The health/smoking approach is partially effective for middle-aged smokers, but there has been a worrying increase in smoking in young people. Recent figures indicate 70 per cent of Australian boys aged 15 now smoke regularly, and 20 per cent of nine-year-olds.

The limited success of anti-smoking campaigns is not surprising in a society where drugs such as alcohol, tobacco and now marijuana are used in such quantities, not to mention the enormous consumption of medicinals such as tranquillisers, aspirin, barbiturates—a tribute to our antidotal health care system.

There is a minor note of optimism in respect to smoking that is not shared by other drug types—it is rapidly becoming regarded as an antisocial habit—a marked change over just a few years. This may be the most effective anti-smoking weapon yet.

Science at Work

Members of the Division of Macrobiotic Confectionery's taste panel relax in the sun after sampling the world's first milkshake enriched with protein from abattoir waste.

Wool printing advance

An inexpensive method of pigment printing of wool fabric has been developed by the Division of Textile Industry in Geelong.

The method uses readily available proprietary products in a special formulation to produce prints of high resistance to fading in light, in a wide range of colours.

The prints also have good rubbing fastness, and the handling characteristics of the results are much better than those obtained if conventional pigment-print pastes are used on wool.

The method is suitable for motifs on garments or fabric and, because of the high light fastness, is highly recommended for curtains.

Conventional flat- or rotary-screen equipment can be used.

Letters

I am about to begin an important new collection on behalf of CSIRO and wonder if your readers can help me.

Its general title is 'Bureaucratic Memorabilia' and its aim is to preserve for posterity the written image of the Organization as it moves into the 1980s.

The specific items I seek are those letters, circulars, information sheets, positions vacant sheets and so on that are the most splendid examples of bureaucratic writing style.

One of the most sought after phrases in this field is: 'it is...' because of its ability to totally depersonalise any prose it touches.

Another item of interest would be writing consisting entirely of bureaucratese.

Other items of interest are:
'I refer to your letter of...'
'Your advice is sought...'
'I would think it appropriate...'
'It is envisaged that...'
'In response to your memorandum of...'
'It should be noted that...'
'It is proposed that...'
'Having regard to...'

As you can see this is but a sprinkling. I'm hoping that others will be able to find for me the 'real classics', whether they be single words, whole phrases or even complete sentences.

Once I have collated the information, perhaps CoResearch would consider publishing excerpts from the collection.

Any items relevant (an excellent example that word) could be sent to me at the address below.

I remain,

Yours faithfully,
Wendy Parsons,
Forest Research, Yarralumla, ACT.

I have just returned from a six-month overseas trip to North America and Britain. I wish to put on record my sincere gratitude for the service I received from the staff of our scientific liaison offices in Washington and London.

Both offices have been pared to the bone recently. The Washington office now consists of Jim Whittem, the counsellor, his secretary, and the locally-employed John Cowan who deals with administration.

The London office has shrunk to Milton Moore, the counsellor, his secretary and two locally employed clerks—Bob Heginbotham and Janet Webb.

Acting on its instructions from the Department of Foreign Affairs to minimise its staff, the London High Commission moved Peter Hacking from ASLO last month, and Janet Webb expects to follow. It would be impossible to further reduce the Washington office without it ceasing to operate.

I sympathise in paticular with John Cowan and Bob Heginbotham, who both continue with good humour to give visiting scientists all the support they can under almost impossible circumstances. Thank you, both of you.

Brian Lee
Science Branch
Canberra

CoResearch

A publication for CSIRO staff *Oct./Dec. 1978* **223**

Shape and spirit of CSIRO '79 unveiled

Staff meetings told of changes to come

In a barnstorming tour of CSIRO's major research centres, the Chairman, Dr Paul Wild, and Executive member Dr Keith Boardman, have been explaining some of the changes which will occur in the Organization in the wake of the Government's recommended changes.

They spoke to meetings in Geelong, Clayton, Melbourne, Adelaide, Perth, Sydney, Brisbane and Canberra. At the end of each session there was a free-for-all period for questions and discussion.

They have outlined the present Executive's thinking on administrative arrangements aimed at helping CSIRO function more effectively, and also have presented a penultimate grouping of Divisions and research units into the six Institutes recommended by the Birch Committee of Inquiry.

This grouping is the firm recommendation of the present Executive and will be submitted for adoption by the new Executive of three full-time and three to five part-time members which is likely to be announced before the end of the year.

Staff were told that a Bill which will extensively amend the Science and Industry Act under which CSIRO operates is likely to pass both Houses of Parliament during the current Budget session, scheduled to end before Christmas. (The Bill has since passed through both Houses).

Dr Wild said many of the changes recommended would have occurred in the natural course of events, without the Birch inquiry—for example, the reorganisation of CSIRO's top management structure. The inquiry had helped, however to accelerate a number of desirable changes.

'Perhaps its most significant contribution was to preserve CSIRO as a single entity, funded largely by appropriation from a single-line Budget entry,' he said.

'Subject to normal accountability procedures, we remain masters of our own fate.'

The new structure of the Organization, however, remained subservient to the most important things governing CSIRO's future—policies, programs and the quality of its people.

Dr Boardman's address outlined the reconstituted Act and the effects of its changes.

He said the basic research unit would remain the Division, headed by its Chief, who would still be responsible for the day-to-day management of his staff, and who would still give scientific leadership.

The primary function of the Organization in the past had been to carry out research for the benefit of Australian primary and secondary industry, and other matters referred to it by the Minister.

The new aims, which were written in simpler language, committed the Organization to undertake scientific research to:

- Assist Australian industry
- Further the interests of the Australian community
- Contribute to the achievement of Australia's national objectives
- Observe both national and international research responsibilities in such fields as radiophysics, oceanography and atmospheric research
- As directed by the Minister for Science.

Applying research

Not only was CSIRO now specifically directed to undertake research, it was also directed to encourage or facilitate the application of research results.

The Bill also specified that research work should be carried out in not more than six research Institutes.

A strengthened and independent Advisory Council would be established, and no longer would the CSIRO Chairman or Executive members serve on it. The Advisory Council would be charged with acting as a centre of contact between CSIRO and Government, industry and the community.

It would comprise senior representatives of Government departments and persons selected because of their association with industry, tertiary education and the community.

The CSIRO Annual Report would record the advice of the Advisory Council on broad issues, and the CSIRO Executive would be obliged to record why particular advice from the Council was not followed.

Under the new arrangements, a consultative committee comprising staff association representatives and members of the Executive would be established to allow staff bodies to have an input into conditions of employment and other matters which affected staff interests.

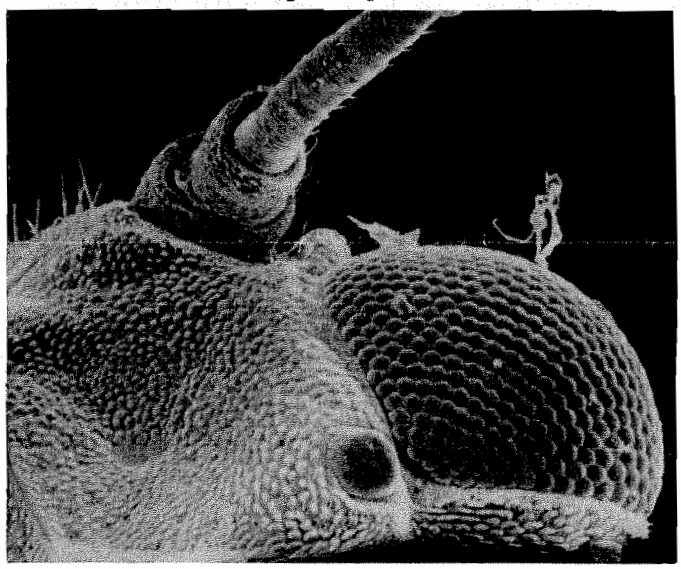
The amended Act also included a requirement upon the Executive for a more comprehensive Annual Report, in which broad policies, objectives and priorities would be explained.

Dr Boardman said there was an increasing questioning by the community of the value and role of science, and this was evident in the number of inquiries CSIRO now received from Government Ministers and backbenchers about its activities compared with several years ago.

In the light of this, a small planning and evaluation advisory unit would be established to advise the Executive on trends, opportunities for research and community

Continued on page 2

'Please do not adjust your antenna. . .'



There's no such thing as an optical illusion before the all-seeing eye of the scanning electron microscope, so the less imaginative reader will see only a speck of dust on the eye of a psyllid insect. Others may see the unmistakeable silhouette of the Pink Panther, humming it up on the set of 'Star Wars.'

How the new Institutes will line up

	Professional staff
Institute of Animal Sciences	
Division of Animal Health	87
Division of Animal Production	121
Centre for Animal Research and Development	12
Division of Food Research	153
Division of Human Nutrition	34
Molecular and Cellular Biology Unit	21
Wheat Research Unit	9
	439
Institute of Earth Resources	
Division of Applied Geomechanics	38
Division of Land Resources Management	67
Division of Land Use Research	64
Division of Mineral Chemistry	65
Division of Mineral Engineering	44
Division of Mineralogy	49
Fuel Geoscience Unit	21
Division of Mineral Physics	27
Division of Process Technology	47
Division of Soils	88
	510
Institute of Biological Resources	
Division of Entomology	133
Division of Fisheries and Oceanography	71
Division of Forest Research	70
Division of Horticultural Research	32
Division of Irrigation Research	25
Division of Plant Industry	132
Division of Tropical Crops and Pastures	70
Division of Wildlife Research	45
	578
Institute of Industrial Technology	
Division of Applied Organic Chemistry	54
Division of Building Research	120
Division of Chemical Technology	60
Division of Mechanical Engineering	49
Division of Protein Chemistry	63
Division of Textile Industry	55
Division of Textile Physics	47
	448
Institute of Physical Sciences	
Division of Atomspheric Physics	43
Division of Chemical Physics	58
Division of Cloud Physics	22
Division of Environmental Mechanics	14
Division of Materials Science	75
Division of Mathematics and Statistics	78
Division of Radiophysics	69
ANMRC	12
National Measurement Laboratory	150
	521
Institute of Scientific Services	
Division of Computing Research	
CILES	
Centre for International Research Cooperation	
Central activities relating to information transfer and technology transfer.	

Discussion and debate:

Criteria for groupings

Dr Wild, before outling the new groupings of Divisions in Institutes, described the rationale underlying the new administrative arrangements.

Previously, he said, the five members of the Executive had to keep in touch with Divisions and Units, regulate resource allocation, co-ordinate broad research programs, oversee staff appointments and promotions, and simultaneously develop policies and new initiatives for the Organization.

In practice, this had proved impossible, and the latter role, the development of policies and new initiatives had not been possible—and this role had fallen, by default, to the Secretariat.

Dr Wild said he wished to emphasise that the role of Chiefs remained essentially unaltered, especially in relation to their Divisional role. If anything, they would be more deeply involved in decision-making than before, via the new Institute structure.

The main new element in the new administrative arrangements was the Institute Director, whose role would be:

- The co-ordination of the affairs of his own Institute, in consultation with his Chiefs, and to act as chairman for a committee comprising all Chiefs which would work on problem-solving.
- The co-ordination of Divisional co-operation, resource allocation, appointments and promotions except at the most senior levels, and the maintenance of external contacts.
- In a corporate role, to meet with his fellow Directors on a management committee, chaired by a member of the Executive, responsible for the regular operation of the Organization, freeing the Executive for policy development and the development of new initiatives.

To make these corporate arrangements workable, Dr Wild said, it had been decided after considerable debate to base all Institute Directors in Canberra with their own support staff, who would be drawn from Head Office personnel and possibly from Divisions—there would be no increase in overall staff.

Groupings

How were the new Divisional groupings in Institutes arrived at?

Dr Wild told staff meetings:

'This is a kind of game all can play. There are many different solutions—no unique one. No grouping will be satisfactory to everybody, so it is a matter of doing one's best.'

He described the two sets of criteria used:

Set 1

- **the relation of an Institute's functions to particular national sectors;**
- **the need to include mutually supporting activities within the Institute where possible;**
- **industry sector characteristics and needs;**
- **the need to communicate with related external bodies; and**
- **regional and geographic requirements.**

Set 2

- **Divisions and Units should remain intact in the present exercise;**
- **each Institute should be capable of description by a simple name covering a significant area of science and technology;**
- **a Director can be expected to have a background in the physical or biological sciences, but not both;**
- **Divisions should, as far as possible, feel comfortable in their own Institute at the present time; future restructuring is always possible;**
- **the size of Institutes should be as uniform as possible with regard to**
  - **i) the number of professional staff; or**
  - **ii) the annual budget; or**
  - **iii) the number of Divisions/Units reporting to the Director.**

The Senate debate

The Senate debated the Science and Industry Research Amendment Bill 1978 late in October.

Speakers on both sides of the chamber paid tributes to the Organization and its staff.

Debate was remarkable not only for its non-partisan nature, but for the obvious interest of the key speakers in the affairs of the Organization.

The debate itself was too lengthy to print in full, so CoResearch provides edited highlights from Hansard:

Senator PUPLICK—I am particularly pleased that the first piece of legislation to which I have an opportunity to address my remarks in the Senate should be a matter dealing with the problems of science and technology in Australia. I do not believe that any single area is in need of greater public attention and greater parliamentary attention or that there is indeed any area where that attention would be more profitable for improving the wellbeing of Australia as a nation and of its people.

We are now past the time when individual scientists, and science as a whole, are able to proceed along their own merry course without making some clear statement to the community they are alleged to serve about what they are doing, why they are doing a particular piece of research, and the consequences of that piece of research. The one general area in which I am most critical of this legislation, which I think in other respects is a very admirable piece of legislation, is that it does not seem to me to enshrine in legislative form in the way in which I think it should the need for greater public accountability of what people in the scientific community are doing, particularly those who are doing it with public money.

One of the things that the Parliament will have to look at in the future is whether there should be established a committee of members of Parliament whose responsibility it will be to take some more active oversight of what is going on in terms of science and technology in Australia. The Parliaments of Holland, the United States of America and the United Kingdom have science forums composed of members of the Parliament. In a non-partisan sense they are able to discuss matters of new development and new technology with scientists. We must get away from the stage where this Parliament and most parliaments tend to be scientifically illiterate and rely very extensively upon a great deal of external advice as distinct from having members with any great in-depth knowledge of the subject.

Senator BUTTON—The real gap or hiatus which seems to emerge is at the research and development level. It is most important I think that urgent steps are taken by the Government to try to do something about this situation. I really think that the defect lies very much with Australian manufacturing industry and indeed with other industries in Australia. We have a small market and a long history of highly protected industries. We have been a very derivative nation in terms of all sorts of matters, but particularly in our reliance on overseas technology. I do not think organisations such as the Commonwealth Scientific and Industrial Research Organization or Australian universities can be blamed for that situation. I think there has been a very strong reluctance on behalf of Australian industry to take up at the development stage research which has been offered by bodies such as CSIRO and Australian universities...Time and time again one hears stories about research projects which have been undertaken in Australia and in respect of which there has not been the imagination, initiative or genuine entrepreneurial skill to take the benefit of that research and apply it in Australia. Unless that happens, we are in for very real problems in a society which will depend very much on information based industries and high technology if it is to employ a signifi-

Continued on page 7

Shape and spirit of CSIRO '79 unveiled

Continued from page 1

needs. It would assist the Executive in assessing advice from its various advisory mechanisms and the Advisory Council.

This would help improve methods for setting priorities and allocating resources.

The unit would be headed by a 'good scientist' capable of interacting at a wide range of levels in the Organization and outside it.

The Australian Science and Technology Council (ASTEC) which is established as a permanent body to advise the Government on science and technology priorities, would have an important influence on the broad allocation of funds for scientific research.

CSIRO had a good working relationship with ASTEC, being represented at its meetings by an Executive member, which would allow this channel of communication with Government to be used.

Dr Boardman said a number of decisions taken by the Government related to information transfer—specifically, a requirement that CSIRO establish better liaison with industry, and that it make more effort to implement its research results.

The Birch inquiry had expressed the belief that CSIRO had not given enough attention in this area, and had recommended greater emphasis upon it in future.

The Executive was aware that such implementation was not an easy matter, but recognised the importance of maintaining a balance between creative and innovative research that was vital to future technology, and to the application of those results.

The Executive was aware that the real and practical interface with industry occurred at Divisional level, and also at individual staff level, and that Divisions differed greatly in their approaches to such activities.

Chiefs would continue to be responsible for such activity, but the new Institute Directors would also have an important role to play in external communication.

CSIRO information and technology transfer would also be a prime function of the sixth Institute, the Scientific Services Institute.

The Government had envisaged an expansion of CSIRO's activities in interpreting and disseminating information from international science and technology for the benefit of technical innovation in Australia.

This area required considerable thought because of the resources which could be committed to such activities, and a group would be established to develop specific recommendations.

'The Executive regards the involvement of staff themselves as very important in disseminating the results of research, and will be recognising this in the future by reviewing promotion criteria,' Dr Boardman said.

The Executive will also investigate, in consultation with the Australian Vice Chancellors' Committee, enhanced collaboration between CSIRO and the universities, particularly where laboratories are located adjacent to campuses.

'There is a trend towards co-operative research overseas, even for co-operation between scientists from different countries.

'Because of a dearth of opportunities and finance for overseas travel, we are isolated in this regard, and are thus at a disadvantage—but collaborative projects are one way of increasing research by teamwork,' he said.

In collaboration with ASTEC, the Tertiary Education Commission and the Australian Vice-Chancellors Committee, CSIRO would be investigating the possibility of establishing national centres of excellence in research.

In relation to overseas travel, Dr Boardman said that although the Birch Committee's recommendation for unrestricted travel overseas had not been accepted by the Government, in future travel by CSIRO staff would be approved by the Executive rather than the Overseas Visits Committee.

The Government had agreed that funds for overseas travel should be fully competitive with other requirements. CSIRO would continue to press for a substantial increase in its overseas travel quota or its abolition altogether, but the economic climate was inappropriate at the moment.

A further decentralisation of responsibility in approving overseas travel would be made by allowing preliminary approvals to be handled by the Institutes, which would lead to faster and more effective decision-making.

In conclusion, Dr Boardman said there was no doubt that CSIRO had a critical and important role to play in research and development in Australia, and the Government was looking toscience and technology to enhance and maintain the competitive ability of Australian Industry.

CSIRONET's charter

The Division of Computing Research undergoes a significant change because of the new shape of CSIRO.

Alone among Divisions it will become self-funding, charging for its services and channelling revenue into expansion of the CSIRONET facilities and its own running costs. The new charter of the Division reads:

The sole responsibility of the Division of Computing Research (DCR) shall be to develop and operate computing services in accordance with policies determined by the CSIRO Executive in the normal way.

'DCR should have the responsibility for the research into, and development and provision of, computing services including a specialist consultative service.

'DCR should give priority to the introduction and provision of advanced computing services (i.e. those not available commercially in Australia) of benefit to Australian science, Government or industry.

'DCR should provide a range of standard computing services (which may be produced as a by-product of advanced services) unless directed not to provide particular services.

'DCR services should be available to arms of Government, tertiary educational institutions and industry. During periods when a service is overloaded, preference should be given to established users

'CSIRONET should recognize categories of users for the purpose of service charges. Charges made for standard computing services provided to trading companies, societies or individuals should be comparable with commercial bureau rates. Actual categories and charges should be determined by the Executive on the recommendation of the Chief, Division of Computing Research'.

Suharto opens Bogor research centre

Landmark in Australia's overseas aid program

The Centre for Animal Research and Development at Bogor in Indonesia, was officially opened by President Suharto of Indonesia on 13 November.

The opening of the centre represents a landmark in the Australian Government's efforts to accelerate development in the South-east Asian region.

Both the Australian and Indonesian Governments expect research by CSIRO and Indonesian scientists at the centre to provide a much-needed boost to the livestock industries in Indonesia.

The importance of the project to both Governments was evidenced by the guest list, which included President Suharto and his wife, the Indonesian Minister for Agriculture, Professor Ir. Soedarsono Hadisapoetro, the Australian Minister for Science, Senator J.J. Webster and Mrs Webster, several other Indonesian Ministers, diplomatic personnel including the Australian Ambassador to Indonesia, Mr T.K.Critchley, and the Chairman of CSIRO, Dr Paul Wild.

President Suharto expressed Indonesia's gratitude to the Government and people of Australia for their contribution to the project and said he was convinced such aid would help create a better life, not only in Indonesia but in the world generally.

He said the problem of the Indonesian diet was a difficult one due to the low purchasing capacity of the people, the low yield and productivity of livestock and the high production costs in the livestock industry.

The Australian Minister for Science, Senator Webster, paid tribute to the people responsible for the concept, design and construction of the centre.

Senator Webster said links were being forged between Australian and Indonesian scientists through on-the-job training and in Australian Universities, but already there was a need for more senior Indonesian scientists to be involved in the planning and growth of the centre, and to ensure that its research was relevant to Indonesia's needs and that its findings were disseminated to the maximum number of Indonesians.

He was most impressed by the progress made—the centre was already producing research findings of practical significance and had conducted seminars on poultry and ruminant production.

Although the new centre was concerned with animal production, Australia hoped its success in the field would demonstrate the relevance of scientific research to the solution of development problems, not only in Indonesia, but in other parts of the world.

Earlier, the Indonesian Minister for Agriculture, Professor Soedarsono, said Indonesia had great potential for livestock production, but the technology to turn available resources into animal protein was lacking.

It was appropriate that Australia, one of the world's leading livestock-producing countries, should assist Indonesia.

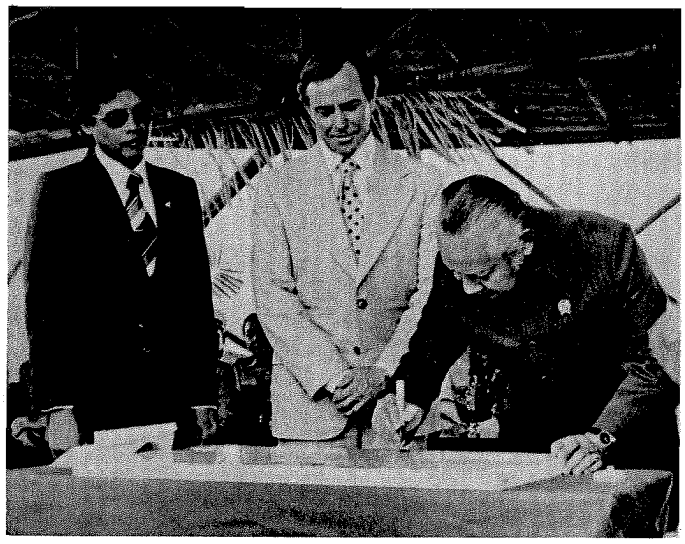
The research at the centre would be long-term in nature, and improvements in livestock production might take many years.

Professor Soedarsono said the complex was built on 28 ha of land, comprising 12 ha for buildings and 16 ha for pasture.

To date about 60 buildings and other installations had been finished, including an administration block, laboratory, library, auditorium and canteen, workshop, and complexes for poultry, ducks and ruminants.

Equipment had been installed to enable international-standard research to be carried out.

Professor Soedarsono stressed the importance of training of Indonesian staff in Australia.



Watched by an Indonesian official and the Australian Minister for Science, Senator J.J. Webster, Indonesia's President Suharto signs a plaque commemorating the opening of the Animal Research Centre at Ciawi, Bogor. The marble plaque will be erected in the main building of the complex.

At present, he said, 17 trained scientists were engaged in post-graduate courses in Australia and another 13 would go to Australia next year.

As these trainees returned to Indonesia the number of CSIRO scientists would gradually decrease until research was fully led and conducted by Indonesian staff around 1984.

The centre at Bogor is financed by the Australian Development Assistance Bureau as part of Australia's official aid to Indonesia.

The buildings were built at a cost of $11m over a four-year period, by the Department of Construction, assisted by staff of CSIRO's Building Branch.

The centre currently employs 346 staff, including 24 CSIRO staff.

Mr V. D. Burgmann retires as Chairman

Accolade from PM for outstanding service

CSIRO staff farewelled the outgoing Chairman, Mr Victor Burgmann at a special function at Forestry House, Yarralumla, upon his retirement from the Organization in September.

Mr Burgmann became Chairman on March 25 last year, and headed the Organization for a brief but difficult period in which its structure and activities were subjected to a comprehensive review by the Birch Committee of Inquiry.

The appointment was initially for a period of 12 months, but Mr Burgmann agreed to an extension of his tenure of CSIRO's highest office until the Government's decisions on the inquiry recommendations were complete, and a new Chairman had been named.

History will record Mr Burgmann as having had the shortest time in office of any CSIRO Chairman to date.

But despite its brevity Mr Burgmann immersed himself deeply in his work, and played a key role in developing the new shape of CSIRO.

His leadership and competence as an administrator quickly earned respect, and his rapport with staff was evidenced by a very large attendance at another farewell function organised by Head Office personnel.

Mulling over the past, present and future of CSIRO, a quartet of CSIRO Chairmen gathered at the farewell function for the outgoing Chairman, Mr Victor Burgmann at Forestry House, Yarralumla. From left, Mr Burgmann, Sir Robert Price, new Chairman, Dr Paul Wild, and Sir Frederick White. Dr Wild's appointment gives the Division of Radiophysics an impressive record as a source of Chairmen—Sir Frederick and Dr Wild are former Chiefs of the Division, while Mr Burgmann spent his early career with the Division before becoming Chief of the Division of Textile Physics. Sir Robert, a biochemist, was Chief of the former Division of Organic Chemistry.

But the ultimate accolade for Mr Burgmann's performance as Chairman came in a letter from the Prime Minister, Mr Fraser,

'In writing to express to you my own thanks, and those of my Government, it would be remiss if I did not comment on the distinguished service you have rendered to CSIRO and through it, to the nation.

'Distinction of course has many meanings and manifestations, and in the field of science is frequently typified by awards and membership of august bodies.

'While you have had your share of these, I am particularly conscious of the versatility and usefulness of your service. For example, involvement with radar, overseas scientific liaison, DME, the pioneering leadership of what is now the Division of Textile Physics and its contributions to wool textile research such as Objective Measurement of Wool.

'Following these achievements you have been involved with scientific administration leading ultimately to occupation of the most senior position in the Organization—Chairman of the Executive.

'I should also like to congratulate you upon the effective manner in which you have discharged your responsibilities as Chairman, in what must have been very difficult circumstances.

'That CSIRO, the Government, and the community at large, can look forward to the next phase in CSIRO's history with optimism is due in no small measure to your stewardship over the past 18 months.'

Involved in radar

Mr Burgmann graduated B.Sc. from Sydney University in 1936 and B.E. (Hons) from the same University in 1939.

In the same year he joined CSIRO's Division of Radiophysics, and with the outbreak of war became involved in the development of radar.

He spent several years in London and then in Washington, investigating developments in radar.

After the war, Mr Burgmann returned to the Division of Radiophysics and led a team which developed radio navigational aids for aircraft.

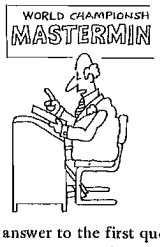
In 1949 he was appointed Officer-in-Charge of the new Physics and Engineering Unit of the Wool Textile Research Laboratories, and when this unit achieved Divisional status in 1959 he was appointed Chief of the Division of Textile Physics.

Ten years later Mr Burgmann became an Associate Member of the Executive and a year later, a full-time Member.

Awards during his carrer included the Prize of the Institution of Engineers in 1939 and the Bronze Medal of the British Institute of Navigation in 1951.

In January last year he was created a Companion of the Order of the British Empire.

Colin Totterdell's magnificent photograph of alpine wildflowers which adorns the front of this year's CSIRO Annual Report has created such interest that special colour prints have been produced for sale to staff. The prints, which can be ordered through your Division, measure 30 x 45cm, and sell at 50c.



'Now, the answer to the first question you passed on. . . your name is Paddy O'Reilly.

CoResearch apologises for the fact that some items submitted for publication have had to be held over until the next edition.

Biomembranes, life's perplexing palisades

Many Divisions seeking their secrets

About half of CSIRO's Divisions carry out research programs into biological membranes and the scientists involved are physicists, chemists, biologists, biochemists, theoretical mathematicians or electronic engineers.

The reason for such interest is apparent when it is realised that every living cell contains at least one membrane and that highly developed animals and plants may have up to 10 distinct membrane systems in each cell.

The architecture of the cell is shaped by membranes, since they not only separate the outside environment from the interior of the cell, but also form many small compartments within cells. In this way certain biological reactions can be confined to one section of a cell and the interaction of one compound with another may be controlled or prevented. Membranes also act as surfaces on which many important enzyme reactions occur, and they control the diffusion of substances throughout the cell.

Despite the many different functions of membranes in living cells, and an astonishing diversity in their composition, the basic structure of all membranes is similar.

Their major components are proteins and lipids: the latter forming an oriented structure in which the proteins are embedded or attached.

Lipids which occur in membranes have a water-attracting head and a water-repelling tail, and this amphiphilic property forces them, when in contact with water, to align in ordered arrays of bilayers with the heads pointing outwards and the tails arranged towards the interior.

This unique structure, only two molecules wide, allows the proteins to be located on one side or the other, or to penetrate right through the membrane (Fig. 1).

However it must not be assumed that membranes are rigid structures. There is ample evidence that proteins and lipids can move rapidly along the membrane, although the rate at which they pass across it, from one side to the other, may be much slower.

Bilayer structure

A membrane may be seen in a number of ways. In a thin section of a cell, appropriately stained, a photograph taken with an electron microscope shows the membranes as distinct lines (Fig. 2). Under very high magnification these lines will resemble a pair of tramlines, reflecting the basic bilayer structure.

If the membrane is split down the middle by the freeze-fracture technique, a different image is obtained in the electron microscope, in which the proteins can be seen as lumps in the lipid matrix (Fig. 3).

The plant chloroplast which is the site of photosynthesis, is one important membrane system which is under investigation in a number of CSIRO Divisions.

Most life depends on photosynthesis, the process by which solar energy is converted to chemical energy, since it not only provides food and oxygen, but also traps solar energy in forms which can be used as fuels.

The solar energy is collected by chlorophyll molecules, which are intricately arranged on specific proteins in the chloroplast membrane, so that a photon of light is snatched in less than one-billionth of a second, and passed on to specialised chlorophyll molecules, from which it can be transformed into chemical energy. This in its turn, provides energy for the conversion of carbon dioxide into complex molecules in other parts of the plant cell.

Chloroplasts

In the Division of Plant Industry, scientists are actively engaged in understanding the basic molecular structure of chloroplast membranes, with special emphasis on the isolation and characterisation of the chlorophyll-protein complexes of green plants and brown seaweeds.

Another program is concerned with various biophysical aspects involved in the conversion of solar to chemical energy by chloroplast membranes.

Such fundamental studies are needed if photosynthesis is to be understood and perhaps mimicked by artificial solar energy convertors.

In addition, the fixation of carbon dioxide is being studied in plants that use the C4-pathway of photosynthesis; many of these plants are important in Australian agriculture.

In the Division of Food Research, the Plant Physiology Group has carried out various studies aimed at understanding the relationship between proteins and lipids in membranes, including the chloroplast. This research involves the separation and identification of the membrane components, and a comparison of how changes in the lipid might affect the biological activity of membrane proteins.

In such studies, temperature plays an important role because plants, unlike many animals, are directly affected by the diurnal and seasonal fluctuations in temperature around them.

Young plants of many commercially important species including corn, tomato and cucumber are adversely affected by temperatures below about 10°C, either by day or night, and fail to develop properly.

One of the most readily observed effects of exposure to low temperature in these plants, is their failure to synthesise chlorophyll, and to develop normal chloroplasts.

The Division of Horticultural Research has a number of projects aimed at providing a composite picture of how environmental factors such as carbon dioxide concentration, salinity, water supply and sunlight affect the photosynthetic performance of plants and their productivity, and a complete understanding of these facts is dependent on knowledge of how the chloroplast itself is affected.

Photosynthesis by marine plants, from small microscopic algae to giant kelps, is a critical factor in maintaining life in the sea, and it has been estimated that one-quarter of the world's photosynthesis is carried out by microscopic plants, the phytoplankton.

These examples provide only a brief glimpse at part of one aspect of CSIRO's involvement in biological membrane research.

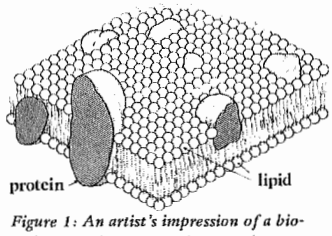
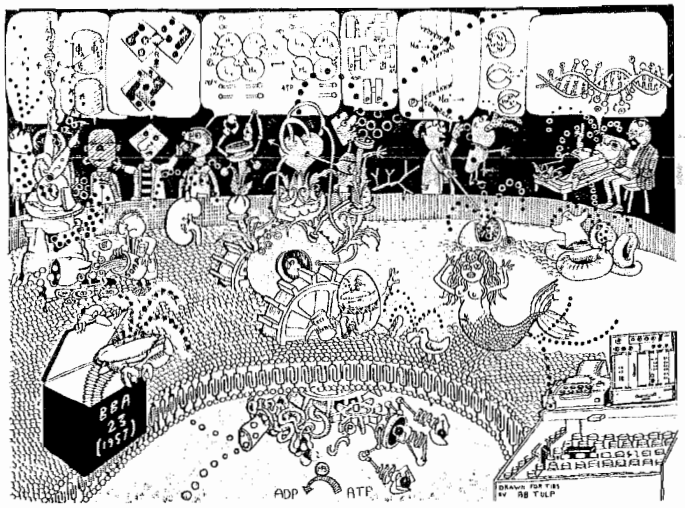


Figure 1: An artist's impression of a biological membrane, showing protein molecules embedded to varying degrees in a lipid bilayer. The water-attracting heads of the lipid molecules are arranged at the outside of the membrane, while the long water-repellent tails point inwards.

A cartoonist's impression of the activity occurring on a biological membrane. (Courtesy TIBS)



SEMINAR SERIES

The CSIRO Biomembrane Committee is currently conducting a series of one-day seminars on the principles of structure and function of biomembranes.

As Co-Research goes to print, the seminar has moved to Sydney University, after being conducted at Melbourne University and the Waite Institute in South Australia. It runs in Brisbane on November 27.

The success of the earlier seminars has prompted the organisers to add Canberra to the itinerary, on Friday, December 8.

The Canberra meeting will be held at the Research School of Chemistry, Australian National University, and will be chaired by Dr Keith Boardman of the CSIRO Executive.

The program and speakers will be:

1030 - Membrane Lipids (Dr D.G. Bishop, CSIRO Division of Food Research).

1130 - Membrane Proteins (Dr I.J. Ryrie, Research School of Biological Sciences, ANU).

1400 - Membrane Structure (Dr J. Israelachvili, Research School of Physical Sciences, ANU).

1500 - Membrane Bioenergetics (Prof. Sir R.N.Robertson, Research School of Biological Sciences, ANU).

A registration fee of $5 is being charged, payable at the meeting. Further information can be obtained from Dr Jan Anderson, on Canberra 465936.

Figure 2: A freeze-fracture electron micrograph of a chloroplast showing areas where protein molecules are clearly distinguishable in the lipid matrix. (Photo Dr D.J.Goodchild, Division of Plant Industry)

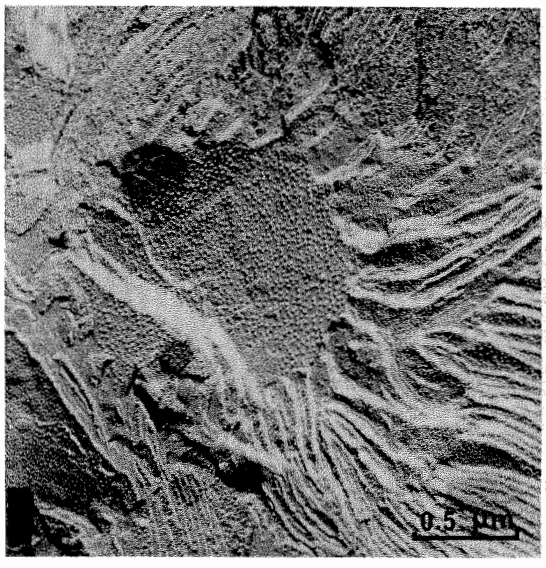
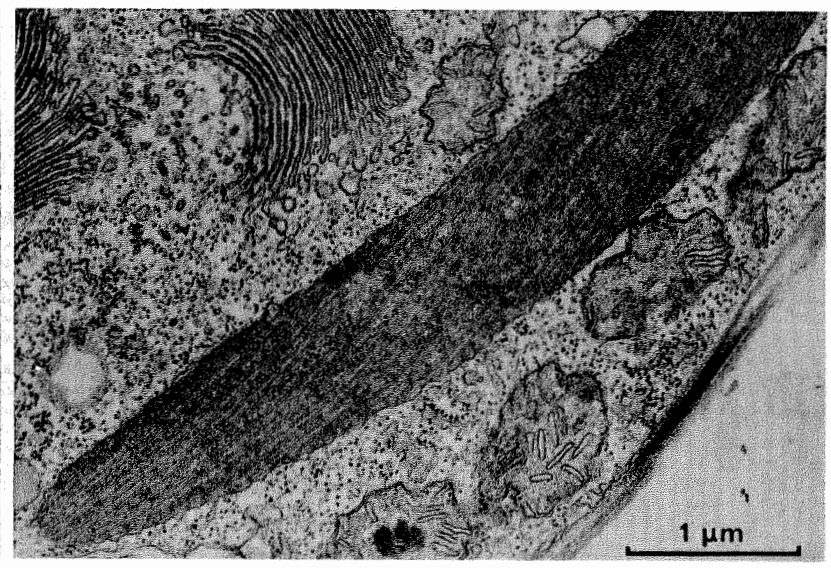


Figure 3: Thin section of the green alga euglena *seen through the electron microscope. A number of distinctive membrane structures can be seen, with a long-cigar-shaped chloroplast dominating the centre. (Photo Dr J. Bain, Division of Food Research)*



A new leaf for plant breeders

Physiologists try some lateral thinking

An understanding of the physiological basis of a crop's performance would seem of fundamental importance in any breeding program. Yet the record of co-operation between physiologist and plant breeder is unspectacular. Breeders still claim it is possible to breed superior crops without any basic understanding of physiology, while physiologists point to the often quite modest improvements in crop performance after decades of intensive breeding. Who is right? The Division of Plant Industry is giving physiologists an opportunity to show what they can do.

Perhaps nothing illustrates the opposing viewpoints of plant physiologist and plant breeder more graphically than the case of the wilting sunflowers.

Any sane breeder screening his hybrids for weakness to water stress would pounce upon and eliminate the first plants to show wilted leaves.

But Dr Howard Rawson of the Division of Plant Industry now suggests that eliminating wilting sunflowers could be a fundamental mistake.

He has found that in this wilted state, the leaves still manage to photosynthesise at 50 per cent efficiency because their stomates are not fully closed.

The wilted leaves are angled away from the full impact of the sun, and so use very little water.

Dr Rawson has also noted that towards evening, when temperatures have fallen, the wilted leaves 'pump up' again and after a night's respite from the sun are ready to work again the next day, largely unaffected.

The trait assumes special significance in Australian conditions, where large acreages of sunflowers are grown in natural rainfall.

Any sunflower whose leaves remain turgid, working at full efficiency during the whole day, inevitably wastes large amounts of water, since water loss continues to rise long after maximum photosynthesis is achieved.

In this situation, any plant which runs out of rainwater between 'drinks' will die or be severely damaged, or it may not have enough water left at flowering to set a full head of seed.

The sunflower which limps through the hottest part of day with leaves slack, sipping at its water, runs less risk of running out—and since it works at peak photosynthesis for perhaps half its daylight hours, its yield should not be badly affected.

Dr Rawson poses the question: Can this trait, apparently evolved by sunflowers to cope with water stress, be bred into new sunflowers for natural rainfall areas if its usefulness can be demonstrated?

Perhaps more pertinently, are breeders and growers ready for a plant which so radically challenges their concept of a 'good' crop plant?

Dr Rawson's wilting sunflowers exemplify the lateral thinking being employed by Plant Industry's physiologists—and it must be said that even the Division's own breeders remain to be convinced of the merit of such ideas.

Dr Ross Downes is approaching the sunflower water stress problem from another angle, again based on an understanding of the plant's physiology.

He suggests the summer stress period could be avoided by selecting plants which mature earlier or later in the year. Not only is water stress a problem in summer, heat also depresses yields.

Early-maturing plants have been selected to avoid the stress period, and also to give greater flexibility in planting times.

Winter sowing

Dr Downes believes there may be scope for developing types which yield well after being sown during winter.

For winter planting there may be a need for varieties with a high content of poly-unsaturated oil which is less prone to solidify at low temperature. He is investigating this aspect.

Dr Downes is attempting to develop types which produce high-quality oil under all conditions, especially under high temperature or when subjected to attack by the sunflower pest, the Rutherglen bug.

Mr Lach Myers has been studying another oilseed—rape—to see if yields can be lifted through an understanding of its physiology.

He has found that rape flowers and subsequent seed set are unaffected by temperatures down to -4°C. Unlike wheat, there is no need to avoid frosty weather at flowering.

Yield is actually increased by low temperatures up to the time of flowering, and is very closely correlated with the dry weight of the plant—simply, the bigger the plant, the higher the yield.

In planting late, growers reduce yield by limiting the time the plant has to accumulate dry weight before flowering.

Mr Myers believes planting to maximise exposure to lower temperatures, prolonging the early growth season, increases plant weight and yield.

Plant physiologists in the Division are also taking a fresh look at Australia's most valuable crop, wheat.

Dr John Passioura is looking at a novel way of helping wheat avoid water stress during the growth period from anthesis (flowering) to grain maturity.

In many areas of Australia, wheat flowers, sets seed and matures during the hot months, using water in the soil which fell as rain during winter or the fallow period before the crop was sown.

In poor rainfall years, summer maturing wheats may begin to run out of water around the time of anthesis, and despite healthy progress in growth up to this point, will set fewer and smaller grains as water stress sets in.

Dr Passioura says wheat's many-branched primary root system draws too strongly on subsoil water at a time when the plant may need to conserve it for later use.

Duplicating natural rain-grown conditions in a glasshouse experiment, Dr Passioura pruned a number of individual plants of all except a single primary root, so that no matter how strongly the plants sucked, they could obtain only limited amounts of water.

Unwatered during their growth, the pruned plants were smaller than unpruned plants in a control group grown under the same conditions.

But with water still available at anthesis, the pruned plants went on to yield twice as much seed as the control plants, which had already exhausted most of their water.

Dr Passioura says drought-resistant plants generally suffer from the disadvantage that they are unable to give high yield in good seasons.

But plants whose drought resistance is due to a conservative primary root system need not suffer this disadvantage, for in a good season the secondary root system, which is usually restricted to the topsoil, should develop well and amply supply the leaves with water from the wet topsoil.

Dr Passioura and a plant breeder colleague, Dr Richard Richards, then went looking for wheat types whose water uptake rate was genetically limited.

These were scarce, as plant breeders had effectively eliminated the trait from modern lines.

They found only two, both wild types, after screening more than 100 modern and 900 wild types from the Australian Wheat Collection.

The character they were looking for was not a single root, since this is not known in wheat, but types with a narrow xylem vessel diameter in the roots (xylem vessels are the 'tubes' which carry water through the roots to the leaves).

According to the laws of physics, reducing the diameter of a tube by half increases resistance to fluid flow 16 times, so even a small reduction in xylem vessel diameter would be beneficial.

Dr Richards began a program of crossing and back-crossing these two primitive wheats with modern varieties, to produce lines with the good characteristics of modern wheat, but displaying the narrow xylem vessel (NXV) character.

The NXV-type wheats could be identified at the seedling stage by examining their roots, allowing very large numbers of non-NXV wheats to be screened out to keep numbers manageably small.

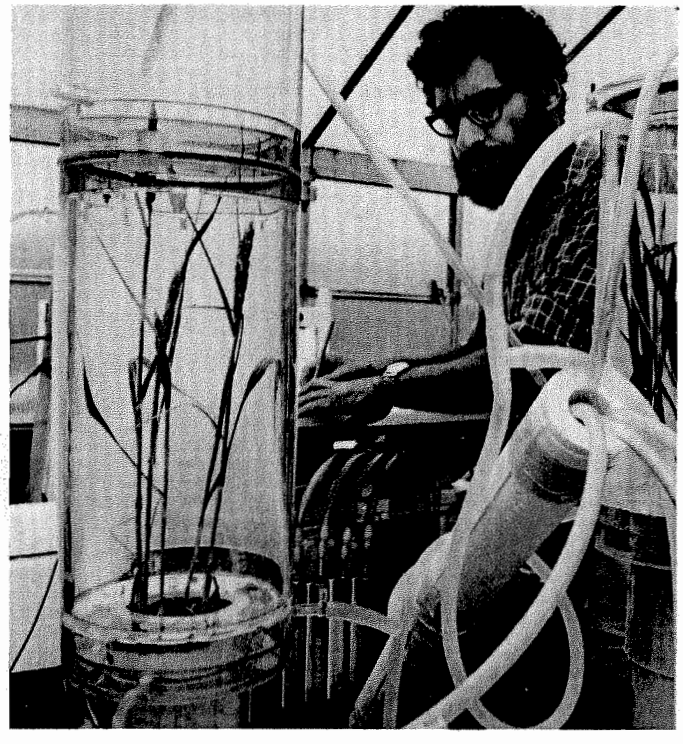
Dr Richards is also interested in another crop, barley, for similar reasons. He has obtained from Denmark a mutant strain of barley which has a single main root.

Physiologists and geneticists alike are excited by the mutant because it differs from its multi-rooted sibling variety by just a single gene.

Thus, when the two are grown in identical conditions, any differences in the physiology or performance of the mutant can be attributed to the effect of this single gene.

The Division of Plant Industry celebrates its jubilee this year. Created as the CSIRO Division of Economic Botany in 1928, the Division now enjoys a world reputation for its research. This article, the second in a series, looks at an aspect of its research.

Dr John Passioura works with his experimental wheat plants, trying to find a genetic detour around the summer water stress problem (see article).



Wheat survey

An agronomist, Dr Jim Davidson, is conducting a survey of Australia's major wheat varieties of this century and last.

During this long period of wheat growing there has been an improvement in the fertility of our wheatland soils, as a result of the use of superphosphate and ley-cropping systems which rotate wheat with nitrogen-fixing legumes.

Dr Davidson's work aims at assessing the change in responsiveness of varieties to phosphorus and nitrogen which has been achieved by Australian wheat breeders.

He is looking at some of the varieties brought into Australia by the early settlers—varieties which were selected before plant breeding began.

He is also looking at varieties selected by Australian growers around the turn of the century, lines produced by Farrer and other early breeders, and important varieties of recent years.

In co-operation with the Victorian Department of Agriculture, and hopefully other State departments, he plans to grow about 70 varieties over a wide range of soils in the wheat belt.

By growing older wheats in today's soils, in proximity to modern varieties, some assessment of the breeder's contribution to today's yields can be made.

In another wheat project, Dr Davidson is comparing a glasshouse-based breeding system with a conventional system for effectiveness in producing high-yielding lines.

A glasshouse allows a breeder to grow three generations in a single year, but there is no way of knowing how such wheats will perform in the field.

The glasshouse system could carve three or four years off a conventional breeding program, which might take six or seven years. The major difference is that culling must take place after, rather than during, the breeding program.

The conventional breeding system selects for certain characteristics in each generation grown in the field. The glasshouse system employs physiological criteria as 'markers' during breeding.

Best combinations

At the end of the program, the combination or combinations of markers which generated the best wheats can be identified for application in subsequent breeding programs, which hopefully would simplify the task of breeders.

The program has a secondary aim—the breeding of wheats suited to Australia's high rainfall zones, where the dominance of grazing has limited diversification into other forms of agriculture.

Dr Davidson has crossed seven high-yield English wheats with a Mexican semi-dwarf variety to overcome the daylength sensitivity of the English lines.

The development of high-rainfall wheats may allow graziers to enjoy the same economic resilience as their dryland counterparts, who have been well served by the traditional wheat/sheep combination.

People

Mr George Williams

Mr George Williams, Manager of CSIRO's Central Communication Unit, has retired.

An experienced administrator, Mr Williams was a key figure in establishing the CCU and directed its activities during a period in which political, public and media interest in CSIRO underwent rapid expansion.

He energetically promoted the view that communication was an integral part of the scientific process, not merely an adjunct to it—a philosophy written into CSIRO's charter in the wake of the Birch inquiry.

His early career began with four years of military service with the AIF and RAAF, after which he joined the NSW Public Service and worked with several Departments during the 1950s.

During this period he gained the degree of Bachelor of Economics from Sydney University.

In 1958 he joined the Division of Fisheries and Oceanography as Divisional Administrative Officer, and his subsequent involvement in policy aspects of the fisheries program saw his reclassification as Technical Secretary in 1963.

In 1965 he was appointed Chief of the Fishery Intelligence and Reports Office of the United Nations Food and Agriculture Organisation in Rome.

He returned from Rome in 1967 to become an Assistant Secretary in CSIRO Head Office, and became personal assistant to the then-Chairman, Sir Frederick White.

Simultaneously he assumed responsibility for CSIRO's public relations activities and for the Film Unit.

These latter responsibilities became an increasingly major part of his work, and in 1973 the various groups under his control were amalgamated to form the Central Communication Unit with Mr Williams as Manager.

In addition to managing the Unit, he also assumed an overall responsibility for CSIRO's internal and external communication at all levels.

Dr Dal Swaine, of the Fuel Geoscience Unit, spent two weeks in Sweden in November on both academic and commercial tasks.

The IVA (Royal Swedish Academy of Engineering Sciences) invited Dr Swaine to give the opening paper on 'Heavy Metals in Coal' at a one-day symposium on this topic.

This was held in Stockholm on November 13.

As a guest of the Academy for the rest of the week, Dr Swaine visited several organisations for discussions on coal for power production, with emphasis being placed on the heavy metals aspect.

During his second week, Dr Swaine changed hats and became a one-man Coal Mission in Sweden on behalf of the Australian Department of Trade and Commerce.

Mr J.J. McNeill, a senior member of the research staff of the Division of Chemical Physics, has retired after nearly 23 years with the Division.

Mr McNeill had a distinguished career at Melbourne University in Natural Philosophy, as it was then called. He also distinguished himself in athletics, and for many years held the University record for the triple jump.

In 1938 he joined the Munitions Supply Laboratories at Maribyrnong, and the following year was sent to Imperial College London for a two-year course in applied optics. Coincidentally he went to England on the same ship as his friend and University contemporary Lloyd Rees, whose Division he was later to join.

Returning to Melbourne in 1942, he set up the optics laboratory at MSL and was responsible for major technological developments associated with the establishment of a precision optical industry in Australia.

On transferring to CSIRO in 1955, he started a Specialized Optics Group in the Chemical Physics Section of the then Division of Industrial Chemistry, set up an optical workshop, and himself undertook a number of research projects, including the development of echelle spectroscopy.

Later he was deeply involved in the optical aspects of ruling and testing diffraction gratings.

His abilities as an optical designer and his wide knowledge of optical techniques and technology led to his advice and assistance being widely sought both within and outside the Division. He played an important part, for instance, in the coating and testing of the corrector optics for the Anglo-Australian telescope at Siding Spring.

At his retirement party the members of the Division presented him with a cassette deck and two examples of Divisional optical craftsmanship—a telephoto lens for his camera and a novel array of diffraction gratings.

Toilet rolls, giant termites and no small measure of showmanship contributed to the recent outstanding success of the Division of Building Research stand at the recent Parth Homemakers' Show.

Sandwiched between commercial exhibitors, the Building Research team regularly attracted large crowds of people by holding aloft specimens of the giant termite, *Mastotermes darwiniensis* and items of its preferred diet—Public Service toilet rolls.

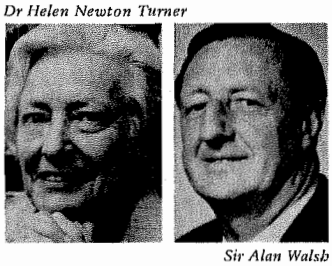
Visitors to the stand then asked questions, saw other exhibits and departed with information sheets.

Eminent CSIRO geneticist Dr Helen Newton Turner has become the first Australian scientist to be awarded the prestigious Ceres Medal by the United Nations Food and Agricultural Organisation.

The citation accompanying the announcement of the award to Dr Turner, said Ceres 'remained a symbol to the world's hungry people taking the face of humane and distinguished women of our own time on Ceres medals issued by FAO.'

Dr Turner received her medal recently during an overseas trip.

Dr Helen Newton Turner



Sir Alan Walsh

Sir Alan Walsh, who retired from the position of Assistant Chief of the Division of Chemical Physics in January last year, has recently been named as a recipient of the John Scott Award by the City of Philadelphia, USA, 'for his invention of the atomic absorption method for quantitative analysis of the elements'.

The John Scott Award, comprising a copper medal and a sum of $4000, is made from a fund inaugurated in 1816 by a bequest to the City of Philadelphia by John Scott, a chemist of Edinburgh, Scotland.

It is made for 'inventions that will be useful to mankind in the development of chemical, medical or any other science or development of industry in any form, the test being that it may add to the comfort, welfare and happiness of mankind'.

The Award has always been made on an international basis, and more than 500 notable men and women have qualified as recipients since its inception.

These include Orville Wright, Madame Curie, Guglielmo Marconi, Sir Alexander Fleming and Baron Howard W. Florey, Dr Walter H. Brattain and Professor John Bardeen, Sir Frank Whittle, and Professor Charles Townes. The only previous Australian recipient is Baron Florey.

Since his retirement Sir Alan has been employed as a consultant spectroscopist and spends much of his time in the US and Europe.

Kimberley Research Station's farm manager, Mr Gordon Salton, has retired.

Staff at the research station farewelled Mr Salton and his wife Peggy at a special function, which was attended by the Chief of the Division of Tropical Crops and Pastures, Dr Ted Henzell.

A group of eight Chinese scientists and technologists and an interpreter visited Australia recently as part of an exchange agreement between the Chinese Academia Sinica and the Australian Academy of Science.

The purpose of the visit was to make contact between Chinese and Australian scientists and technologists and to exchange experiences on current work, achievements and plans for research development and applications of solar energy.

Dr John Kowalczewski, Assistant Chief of the CSIRO Division of Mechanical Engineering was the Australian co-ordinator for the group which represented many different Institutes and Universities in China, from Peking, Shanghai, Kwangchou and Tientsin.

Their areas of specific interest were solar collectors, materials technology for collectors, solar thermal electrical power generation, solar desalination and solar housing designs both active and passive.

During their stay in Australia they visited the six major mainland capital cities and were able to meet scientists doing solar energy or related research in the CSIRO Divisions of Mechanical Engineering, Mineral Chemistry and Chemical Technology as well as in University Departments and Institutes of Technology involved in solar research.

The delegation was very interested in the commercial and industrial demonstrations they saw, including the solar can warmer at the Queanbeyan Coca-Cola Co factory installed by the former CSIRO Solar Energy Studies Unit, and the more recently installed solar beer pasteuriser unit in the South Australian Brewing Company's Adelaide brewery.

They also visited the premises of several of the larger companies involved in the manufacture of solar collectors.

During the visit they were received and welcomed by a wide range of Australian dignitaries including the Minister for Science, Senator Webster, the Premier of South Australia, Mr Don Dunstan, the then Chairman of CSIRO, Mr V.D. Burgmann, the South Australian Minister for Mines and Energy, Mr Hugh R. Hudson, the Victorian Minister for Minerals and Energy, Mr J.C.M. Balfour, the Western Australian Minister for Industrial Development Mines and Fuel and Energy, Mr A.Mensaros and the Lord Mayor of Perth, Mr F.C. Chaney.

Mike Stanfield, a TA with the Division of Entomology in Hobart, has been selected in an Australian judo team which departed Australia on 17 November to compete in Japan, Korea, West Germany, Holland, Switzerland and the UK and Canada. The tour will take about five weeks.

In the Australian Judo Championships held at Brisbane last May, Mike won a bronze medal in his weight class.

He is working for Dr Robin Bedding, who had his black belt when he came to Tasmania from the UK. He was coached by Robin at the Hobart YMCA when he first became interested in judo.

Mr S.W. (Bill) Bailey has retired from his position as a Senior Principal Research Scientist with the Division of Entomology, where he was Research Leader of the Stored Product Investigations group.

Mr Bailey's career spanned the entire period of post-war development of scientifically-based methods for the storage of grain. He made many notable contributions to the subject and is recognised as one of the eminent storage technologists of the world.

He joined CSIRO as a Research Officer in the Division of Entomology in 1950, to carry out research on insect pests of stored grain and flour mills.

For 18 years, he and a technical assistant were the only members of what was later to become one of the larger problem-oriented groups in the Division, employing a total of 30 people.

During these 18 years he surveyed the problems associated with the storage of wheat and flour and pursued many fruitful lines of stored product pest research.

His major work during this period was on hermetic storage of grain and its effect on insect pests which set a foundation for much of the work on airtight storage and use of controlled atmospheres carried out subsequently around the world, and is receiving considerable attention in Australia today from the next generation of entomological workers.

During this time, he produced more than 30 papers on storage and associated topics.

Mr Bailey has been a valued consultant for many Government departments, and in recent years, particularly for the Australian Development and Assistance Bureau for whom he has visited and advised on food storage problems in Burma, Bangladesh and the ASEAN countries.

Mr Bailey is not retiring from active participation in storage technology—he has been appointed a food storage consultant to ASEAN and no doubt will be sought after for other assignments where his wealth of experience and ability can continue to serve both the Australian grain industry and developing countries.

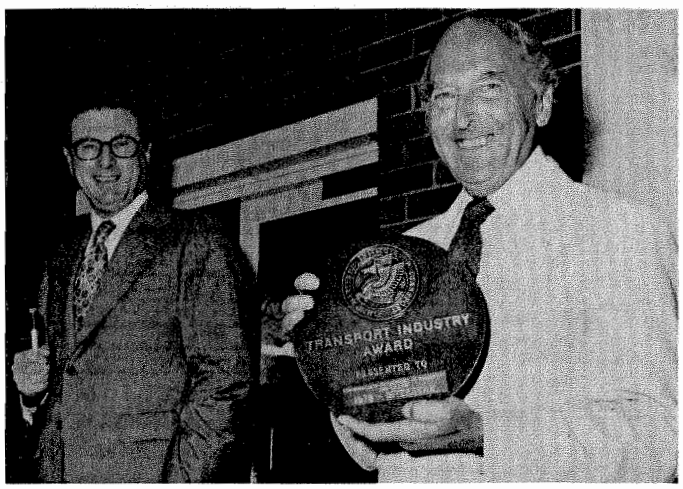
'I hear the Division of Macrocircuitry will soon be run by a pinhead no bigger than a silicon chip.'

With apologies to *Punch*

The Arthur Frost Memorial Award, an award of $200 to the apprentice judged to have made the greatest improvement in his final year, has been won this year by Eric Nagel, formerly an apprentice at the Division of Atmospheric Physics.

The $200 award is contributed to jointly by CSIRO and the CSIRO Laboratory Craftsmens Association.

The award was presented to Eric by Dr G.B. Tucker, Chief of the Division of Atmospheric Physics.



Another accolade for that little Aussie battler, Interscan. This time, a bronze plaque from the Chartered Institute of Transport, which was awarded jointly to the Division of Radiophysics and the Commonwealth Department of Transport, for their involvement in developing the world's new microwave aircraft landing system. Shown with the award are the Chief of Radiophysics, Mr Harry Minnett, (right) and former Chief and new CSIRO Chairman, Dr Paul Wild, (left).

A star-studded cast of judges drawn from the Australian Academy of Science, CSIRO and the local teaching profession recently officiated at the first annual Schools Science and Inventors Fair in the ACT.

Sponsored jointly by the Science Teachers' Association of the ACT and a Canberra shopping centre, the fair attracted 120 entries from primary and secondary school students.

CSIRO's contribution to a highly successful event was supplied by Dr Joe Gani, Chief of the Division of Mathematics and Statistics, Dr Michael Dack of the Central Communication Unit and Mr Ed Highley, Scientific Liaison Officer at the Division of Entomology (who has refuted allegations that he kept muttering '...but is it safe... can it be made in any other colour? ').

Other judges with CSIRO connections included Sir Otto Frankel and Professor Arthur Birch. The Professor participated in the 'Science as Art' section (Academy of Science), and personally offered and awarded a prize for the best science cartoon.

The section on 'Social Significance of Science' (Academy of Science) attracted a high standard of energy-conserving entries, including two working solar water heaters, a wind generator and a polystyrene igloo which heated up to 85°F with a 25 watt lamp.

First prize in the general section went to a senior secondary student for his home-made electron microscope. He also entered a mass spectrometer of his own construction...

A permanent display has been established in the foyer of the Division of Soils' Canberra Laboratories.

A small gathering to mark the occasion was attended by Divisional staff including the Chief, Dr Arnold Martin, who came from Adelaide, Mr Howard Crozier and Mr Denis Young from Head Office, and representatives of teaching institutes throughout the ACT.

The display was opened by the Officer-in-Charge, Dr John Loveday. After a brief description of the display and its purpose by Dr Loveday, refreshments were served while Divisional staff explained particular facets of the models to individual guests.

The display itself was proposed by the Australian Society of Soil Science, ACT Branch and developed through the joint efforts of the Division of Soils and the Division of Land Use Research.

It presents an introduction to the soils and landscapes of the Canberra region in a manner which can be used by teachers and groups of students with minimal explanation from professional scientists.

Mr Alan Doery, who retired from the Head Office Conference Group last year, has been making constructive use of his first year outside CSIRO by committing some of his considerable expertise in organising and running conferences to print.

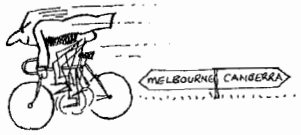
With Mr R.D. Croll, he is co-authoring a conference manual, to be published soon.

Mr Doery joined the CSIRO Agricultural Research Liaison Unit in 1964, and from within the unit began to develop new techniques with emphasis on conference design.

Many a venerable velocipede has been dusted off since it was announced that CSIRO would pay a small allowance to staff members choosing to cycle rather than use staff vehicles in the course of their duties.

The allowance is not new—in fact, it has never lapsed since it was first introduced back in CSIR days—rather, it was simply forgotten.

Some Canberra Divisions have even gone one further by buying bicycles for staff use (Canberra has a growing network of bicycle paths). Entomology, Mathematics and Statistics, and Environmental Mechanics all have publicly-funded pedallers.

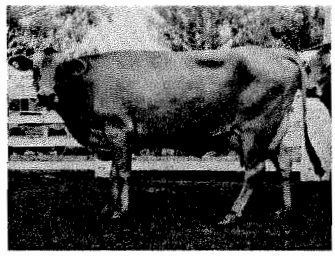


Not only have the bicycles been revived, but some memories along with them—like the time a steel-thewed entomologist sought and received permission during the war years to pedal to Melbourne and back to obtain a termite colony!

He headed off into the sunset, obviously inspired by the thought of vast riches accumulating at the rate of tuppence a mile, duly collected his termite colony, slung it over his back, and returned triumphantly to Canberra.

He put in his mileage claim, and was astounded to find it had been reduced by 13/4d. He had taken the extraordinary liberty of going via Cann River and Gippsland, instead of the shorter Hume Highway route—and the rules said 'shortest practicable route'.

Scientists were a tough breed in those days, but the accountants were tougher...



CSIRO's specially-bred tropical dairy cow, the Australian Milking Zebu, is continuing to enhance its reputation internationally.

The January edition of Nestle's Diary, published in Trinidad, records that progeny of AMZ cattle sent to the West Indian island by CSIRO's dairy-farming co-operators in 1976 are now being consigned to Panama, in Central America.

Under the heading 'Trinidad-born super bulls for Panama farms', the article says six AMZ bulls have been sent to eager and anxious private farms in Panama.

Nestles imported 136 of the Australian cattle as part of a major effort to encourage the production of a truly indigenous beast capable of withstanding the rigours of tropical climes, pasturage problems and parasites, while being a highly efficient converter.

The AMZ, produced by CSIRO breeders by crossing the Jersey breed with the Zebu Sahiwal breed, will apparently be used in further breeding programs in Panama.

The previous edition of CoReserach was assembled with some haste and in difficult circumstances, resulting in some errors.

The edition was numbered 223, which should in fact be the number for this edition.

The 'Perspective' article on smoking contained a transposed block of type which made its comprehension difficult.

Finally, a photograph of the Minister for Science inspecting a low energy house at Highett was deleted at the last minute, but the caption was incorporated in the accompanying article.

CoReserach apologises for these errors.

Discussion and debate:

Continued from page 2

cant number of its population in the 1980s and beyond. Therefore we should look at any measures which are designed to boost the application and the quality of Australian scientific research because it relates very much to the real problem of restructuring Australian industries.

. . . the basic and applied research of an organisation such as the CSIRO is essential to the process of development. I can only join other honourable senators who have generally commended the CSIRO for its outstanding record in this regard. All organisations of this kind are from time to time highly susceptible to public criticism on the grounds of accountability and contribution to the society and the Parliament, which gives them considerable financial support. It would be true to say that of all of the statutory corporations that this Parliament has established over many years there would be perhaps two, the Snowy Mountains Authority and the CSIRO, which would stand out as having a very distinguished record and attracting relatively minor criticism concerning public spiritedness, the importance of the work that they are doing, and the accountability to Australian society which they have shown.

In my view, the Government has not given the CSIRO up to the prsent time the resources which it needs to carry out the functions which it is now envisaged it will have. Those functions are much wider than those the CSIRO had formerly. The CSIRO budget this year has been increased by only 6 per cent in cash terms; that is to say, there is no real growth in the budget. In a total staff of 6000, staff numbers have been reduced by 50 this year. At the same time the Organization is having greater demands put upon it...

One thing which is certain is that developments of this kind, whether they be the establishment of a national applied technology agency or the CSIRO having the capacity to continue its work at the present level of activity and beyond, will require more positions to be created in the CSIRO and will require a flexible application of the staff ceilings which are currently being applied by the Government. What I am concerned about is that there is a difference between the rhetoric of the Government in relation to science policy and the actual reality as at present being exhibited.

The CSIRO Divisions and Laboratories—I think there are 37—are to be grouped into six Institutes which it is supposed will give better co-ordination of research...The CSIRO has never suffered from the sort of organisational malaise that the Australian Broadcasting Commission now suffers from, which is a sort of disease of middle management. One of the advantages of that has been a great deal of flexibility, or comparative flexibility, within the Organization. Therefore the Opposition raises a query about the wisdom of this move and wonders whether it will simply impose another level between creative scientists and the top policy level of the Organization.

I refer next to the fact that the Advisory Council is to be an independent body. That is a very laudable objective. I qualify the expression 'laudable' only by the fact that the Bill specifically forbids a member of the Executive or the staff being Chairman of the Advisory Committee or a State Committee. At the moment the staff of the CSIRO is represented on Advisory Committees. I do not see the reason for the prohibition of staff from the Advisory Committees which, after all, are going to be very important bodies if the intentions of this legislation are to be carried out.

Senator PETER BAUME—Whatever its defect, there has never been a parliament better prepared by reason of training and occupation to make a useful contribution to a debate on science. There are more people in the Parliament now who have been practising scientists in their own right, who have gone through the rigours of scientific training, who have taken higher degrees in scientific disciplines and who have contributed to the world of research.

Senator WEBSTER—I have travelled very widely throughout Australia during these past years looking at various CSIRO installations. My visits have been most elevating and rewarding. I have been most proud to be associated with this Organisation and to realise the dedication of those who work at all levels. I have been proud to say to the staff at all Divisions I have visited that I see the central organisation of CSIRO as being composed of a most aware group of men. They run the central office most economically. Indeed, the liaison that occurs between the Minister and the Executive, as well as those who support the Executive, again is deserving of the very highest appreciation of the nation. Of course, it is their impact on their community which brings about the elevation which CSIRO receives throughout Australia and in international circles.

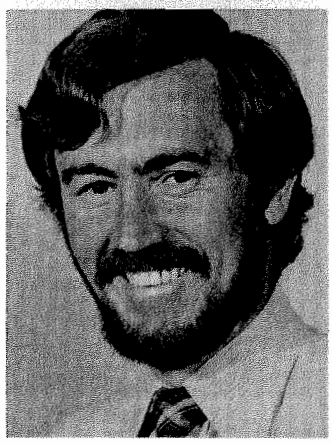
It is interesting to note, as a major policy point, that the Birch Committee recommended that the CSIRO stay as one organisation. At one stage there was a possibility that it might be broken up into several areas to meet the interest of competing Ministers. But we now have the assurance, on the advice of Birch and in accordance with the decision of the Cabinet and the Prime Minister, that the CSIRO will remain as one organisation...

Government financed scientific research will continue to represent a major segment of the nation's scientific endeavour. The provisions of this Bill and the full range of initiatives that are being taken by the Government following the Birch committee of inquiry will, I believe, go a long way towards ensuring that the returns to the community for the investment in research will continue to be maximised. This Bill will ensure that CSIRO's management structure is appropriate for the years ahead, that a full and adequate flow of advice is readily available to CSIRO from industry, government and community generally about national needs and priorities, and that the results of research and the information gained during the course of research are transferred effectively to those sections of the community in a position to put them to practical use or to gain practical benefits from them.

Perspective

Do we need a technological fix...

... or are we already in one?



ED HIGHLEY is Scientific Liaison Officer in the Division of Entomology. He has worked for three other Divisions of CSIRO and has also been, at one time or another, a bread carter, a baker, a fibrous plasterer, a trainee teacher, a labourer and a laboratory assistant in a copper refinery, a grape picker, a potential encyclopaedia salesman, a sort of medical technologist, and a book publisher's editor in England and Australia.

**fix* n *1 : a position of difficulty or embarrassment : a trying predicament 2 a : the position (as of a ship) determined by bearings, observations, or radio b : a determination of one's position 3 : an act of obtaining special privilege or immunity from the law by bribery or collusion;* also *the money paid to obtain such privilege 4 : a shot of a narcotic 5 : FIXATION*
(Webster's New Collegiate Dictionary)

I often wonder in these purportedly hard times what our technological options within CSIRO are.

I occasionally wonder if options do indeed exist.

Perhaps our technological course is predetermined in one way or another and to talk about, for example, appropriate technology, in terms of the workings of the Organization and the pursuit of its scientific aims is purely notional.

Why do we seem to be continuing to buy big cars with big engines? Cars that will be used mostly by a single person travelling a short distance.

Has the firm thought about a policy on vehicle/engine sizes with a view to conserving fuel and presumably saving money? How many groups in CSIRO have bought and use push-bikes for short-distance travel? What are we doing to encourage greater use of the foot? Is it thought that the line-printer is salvation and the traditional library has had its day?

Perhaps we think too little, if at all, about appropriate technology, and maybe part of the reason for this is that there's no internal, organisational feeling engendering rational decisions in this area.

Maybe even it's considered unimportant; or pointless, in that a force of technological predestiny is in any case impelling us toward ultimate and complete computerisation.

Let me give you an example, which I believe only superficially facile, of one of the ways by which our choice of a technology for a particular task may be to some extent predetermined or, in other words, be no choice at all.

Suppose that you've set out to create a modest store of accessible (to you) information on a particular subject. You decide that the available alternative methods are (i) to keep the information, written on pieces of paper, arranged in folders, in a filing cabinet next to your desk; or (ii) to store it in a retrievable way in a computer.

You opt for the filing cabinet.

It turns out, however, that there are no spare filing cabinets in the Division. Also, the furniture money for the year, the only source of funds for filing cabinet purchase, has been used up, so a new one is out.

You may find yourself then, if you really need that information store, forced into an 'option' you'd previously rejected as unsatisfactory—perhaps even irrational.

You might discover that in using the computer you're buying time, something abstract, and the administrative control over expenditure is less stringent. The accountants haven't caught up on non-hardware.

There are no hassles. All you need to get into the system is a cost code.

In a similar way, current purchasing procredures sometimes make it difficult to buy a book costing, say, $20, whereas $20-worth of computing time may pass with a blink and, were it ever noted, would be considered trifling.

Is this a sort of prejudice against a particular technology, the book? Would a similar sort of partiality be evident if we looked at journals and machine-based information retrieval systems?

CoResearch, apart from being billed as a 'publication' rather than a newspaper, seems to me to be appropriate technology.

It's read, talked about, it informs, and its jokes and cartoons have been known to incite mirth.

'JUST THINK OF ALL THE DATA OUT THERE JUST YEARNING TO BE PROCESSED'

Sometimes persons are actually moved to complete the communication loop by penning a note to the Editor on some heavy but none-the-less important subject, such as the gobbledegook and bombast typical of a deal of correspondence and circulars that flow around and out of the firm.

Maybe, given all these things, CoResearch seems to someone an ideal candidate for improvement by issue, a la 'Australian Science Index', in microfiche only! (Is it that someone has shares in a microfiche reader company, or is it just that we have a machine that makes the little beasties?)

Anyhow, moving from conjecture to actuality, I'm able to relate a quite specific instance of what seemed, to me at least, to be use of a technology inappropriate to a particular task.

As a result of the then existing talents and interests, Annual Reports of the Division of Entomology used to be typeset on the III COMp80 device of the Division of Computing Research, using an elegant program written by a member of the Division.

Typesetting of the 1976-77 Annual Report in this way cost $2400. Had the 1977-78 Report been so set it would have probably cost around $3000. It was longer, and computer charges had gone up during the year.

Instead, however, it was possible to give the job to a trade typesetting house in Canberra. The result, from an IBM Composer, was perfectly satisfactory, and cost just $900.

I should add too that there was no time penalty involved in going to a specialist outside the Organization. The typesetting took just two weeks, which is not bad for a document of around 60 000 words.

Here then we had a choice between two technologies and were able to opt for the one that produced the goods at the lower cost. Similar situations must continually arise throughout the Organization.

Are the options always known? If they are, are they exercised? Or are most of us technologically irretrievable?

Maybe as I've already alluded we have an innate tendency to levitate to the highest form of technology available. I know of at least one Division—and I've little doubt that there are more—where it is not uncommon for senior scientists to type their own papers into the computer and produce manuscripts using the computerised photo-typesetting unit associated with CYBER 76.

Is this appropriate technology? Why do we employ typists? Are their days numbered? Why are research staff, as a group, the highest paid in the firm?

Do we need a technological fix? Are we already in it? Or is the whole current business, as perhaps exemplified by the latest amendment to the CSIRO Directory, with its studied avoidance of punctuation marks, just fashionable idiocy?

'...The ghost he pursued was the ghost that underlies all of technology, all of modern science, all of Western thought. It was the ghost of rationality itself.'
'Zen and the Art of Motor Cycle Maintenance', by Robert M. Pirsig.

Editor's Note: Mr Highley's thoughtful article embodies the purpose of the 'Perspective' column. More literary *agents provocateurs* may be encouraged by his example, as well as writers of letters to the editor. Meanwhile a relevant analogue of Parkinson's Law, from New Scientist, September 21, to wit: 'Information expands to fill the channels available for its transmission.'

Letters

Sir,

We at the AMP have recently been privileged to have appointed our first First-Aid Officer, Mr Terry Fogarty. Equipped with a shiny new First-Aid Kit, he has commenced practice. I think it appropriate that we now advertise his services with the following:

Ode to a First-Aid Officer

'The Doctor Is In', with his glycerine grin
Commanding 'The Kit' (or 'The Kit' commands him?)
A practiced purveyor of powder and potion
He'll soothe all your sunburn with calamine lotion,
Perform your abortion, control your contortion
and hand you a bill that is simply extortion.
Your snakebite is safe with a slash and a suck,
A blow on the head should you then run amuck.
The lovely young lass who might faint on the stair
Will awake to his mouth-to-mouth (just for the air).
His methods amaze, some claim they are crazy
But $2.50 a week doesn't get you Ben Casey.

Norman Pummeroy
Administrative Systems Group
Canberra

Fuzzy Elegance

Apart from the interest of its content, the new style CoResearch has a very elegant appearance, except for the poor quality of the title on the front page.

It looks to be the product of a photo-setting machine and those fuzzy edges and gaping letterspaces spoil the impression created by the rest of the paper.

I've had the same problem with the setting of large type sizes for book titles, and my advice is to use Letraset and enlarge to fit.

Excuse the whinge and let me repeat that the rest of the layout is very pleasing.

Paul Stapleton
Editorial and Publications Section
East Melbourne

Par Avian Rap

Your article 'The Odd Par Avian' apparently finds humorous the English of some bird band finders. In particular it holds a Miss X of Victoria up for ridicule after she had made an effort to help.

Possibly she was being funny, but maybe she would think that you are not.

On a related note (of lack of respect for the helpers) the Report to Finder sent to Miss X asked if the bird was dead or alive, despite her previous letter clearly stating that it was dead. The form letter then asked personal details, such as age and sex. How is knowledge of bird behaviour promoted by such prying questions? Do Government scientists need to act like Government bureaucrats?

Rory Thompson
Atmospheric Physics
Aspendale

PS—Your editorial urging reactions and contributions to CoResearch does not give an address to send them to. One needs to guess?

Editor's note: The point raised by Dr Thompson is valid, and the letter was not printed without consideration. It was more than eight years old, and the writer's name and address were not published. On the other matters raised, the Report to Finder form was a standard form designed to cover all necessary information, for file purposes. Bird band recovery involves the public cooperation, and there is value in knowing something about the finder for statistical purposes. Dr Thompson's letter found its way to the right address.

CoResearch solicits brief, pithy, letters from its readers. Subject to the usual laws governing libel, letters may be vitriolic, passionate, good-humoured, complaining, reflective, laudatory, quixotic or apathetic. The best letter in each issue will attract a Golden Quill. The address is: CoResearch, PO Box 225, Dickson, ACT, 2602.

Unedifying address on letter from CSIRO Officers Association.

Mr G. O'Neill
Edith of Coresearch
P.O. Box 225
Dickson. A.C.T. 2602