CoResearch

CSIRO's staff newspaper

No. 298 December '86 — January '87

New Board announced

Wran's our man

The former NSW Premier and former Federal President of the ALP, Mr Neville Wran, has been appointed to head CSIRO as the part-time Chairman of the new corporate-style Board.

Mr Wran and the eight other part-time members of the new Board, which includes a mix of scientific and business skills, took up their positions on 5 December.

The Minister for Science, Mr Jones, said the present Chairman, Dr Boardman, had been appointed acting full-time Chief Executive, pending advice from the Board on a permanent appointment.

The new Board members include the head of the Walter and Eliza Hall Institute of Medical Research, Sir Gustav Nossal, and the Chairman of the Business Council of Australia, Sir Roderick Carnegie. Sir Gustav, Sir Roderick and Mr Wran have been appointed for five years.

The other new Board members are Mr Bill Mansfield, assistant secretary of the ACTU; Mr David Hoare, the Chairman of Bankers Trust Australia; and Dr Tony Gregson, an organic chemist and farmer from Victoria's western districts. They have all been appointed for four-year terms.

Mr Neville Wran.

Three part-time members of the present Executive have been appointed to the Board for three years. They are: Professor Adrienne Clarke, of the University of Melbourne; Mr Graham Spurling, the managing director of Mitsubishi Motors Australia Ltd; and Dr Kevin Foley, a management consultant

The appointment of the Board follows the passage of new CSIRO legislation through the Senate.

Mr Wran, who said he was 'delighted' with his new job, met Dr Boardman for the first time in Sydney late last month. Mr Wran said the Board would meet before Christmas to establish an agenda for next year.

'The Board's primary role will be to align CSIRO's research priorities closely to national objectives. If Australia is to survive economically it must develop manufacturing and service industries as competitive and innovative as its agricultural and mining sectors. CSIRO's research is crucial to achieving this objective.'

'CSIRO is one of the world's most highly regarded national research organizations, and one of Australia's most respected public institutions. The task of the new Board will be to ensure that Australia gets the greatest benefit from this excellent resource.'

Announcing the new Board, Mr Jones said: 'Cabinet has chosen a very powerful Board. I am confident that it will not only maintain CSIRO's tradition of excellence but extend it into manufacturing and service areas. All members have been appointed for their personal abilities rather than as representatives of particular sectoral interests.

'Neville Wran, after 10 years as Premier of New South Wales, brings to the chairmanship intelligence, drive, energy, deep sense of national commitment, ability to formulate policy priorities and to be a highly visible and effective spokesman for the Organization. We were fortunate to secure his services.'

Mr Jones thanked the retiring members of the Executive for their contribution to the 'revitalisation and redirection of CSIRO' and the Chairman and members of the Advisory Council and State and Territory Advisory Committees for their 'valuable advice'.

'Fears that CSIRO will be confined to short-term problem solving as if it was a type of superior panel-beating shop are groundless. The commitment to excellence will not only remain, it will be enhanced.'

Dr Boardman said he believed the new Board was outstanding in terms of the breadth of experience and knowledge they would bring to CSIRO.

'Mr Wran as the new Chairman has a broad range of skills in administration and policy formulation and has extensive contacts with political and business leaders. He will be very valuable in CSIRO's dealings with the bureaucracy, politicians and businessmen, areas where CSIRO is determined to develop better communication.

'While his experience in science and technology is limited, I have no doubt that on his past performances he will very quickly grasp the key issues involved.'

The President of the CSIRO Officers Association, Mr Roy Bond, said the association had made a submission to the Government on the appointment of the Board.

'Firstly, the Chairman should be an eminent scientist who can act as a figurehead for science and for CSIRO. Secondly, there should be staff participation on the Board. The Government has ignored both of these requests,' he said. However, the association will co-operate with the Board to put forward the views of professional staff at the policy-making level.

The Chairman of the Chiefs' Committee, Dr Warren Hewertson, said Mr Wran had considerable experience of the States' initiatives in fostering new industries. 'His pragmatic background and record of achievement should bode well for the the Commonwealth and States to initiate new ventures of national significance.'

The new members of the Board

Sir Gustav Nossal: One of Australia's most eminent scientists and Director of the Walter and Eliza Hall Institute in Melbourne.

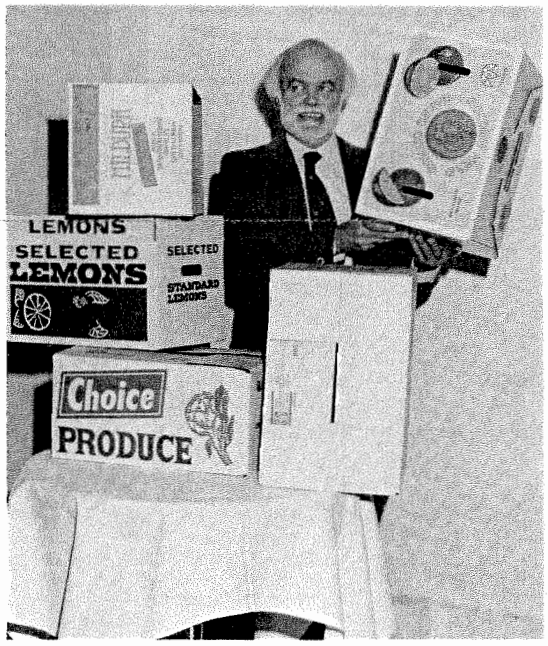
Sir Roderick Carnegie: Chairman of the Business Council of Australia and formerly chairman and managing director of CRA Limited.

Mr David Hoare: Chairman of Bankers Trust Australia and AUSSAT, deputy chief commissioner of OTC (Aust) and with considerable expertise in the service sector, banking and communication.

Dr Tony Gregson: One of Australia's most distinguished organic chemists and formerly an associate professor of chemistry at the University of New England before leaving academia six years ago to become a full-time wheat farmer.

Mr Bill Mansfield: Assistant secretary of the ACTU and formerly federal secretary of the Australian Telecommunications Employees Association and ACTU nominee to the Committee of Inquiry into Technological Change in Australia 1978-80.

'High-utility low tech' invention earns 1986 McLennan award



A leaning towards 'industry-sized experiments' may well have played a crucial role in the development of an award-winning process for manufacturing waxed corrugated-cardboard boxes.

Mr John Coleman from the Division of Chemical and Wood Technology, inventor of the process, has taken out this year's Sir Ian McLennan Achievement for Industry Award. The Advisory Council established the award last year to recognise outstanding contributions by CSIRO scientists to Australian industry.

Mr Coleman believes that wherever possible, industry tests should have top priority.

'Finally things have to work in the real world,' he said. 'You need to temper the scientific approach with a measure of blacksmithing. It helps if you are an opportunist as well.'

He describes the waxing line, which produces boxes some five times faster with less than 20 per cent of former labour requirements and 20 per cent less wax, as an example of 'high-utility low-tech'.

The Victorian Minister for Industry, Technology and Resources, Mr Robert Fordham, presented the award late last month at a ceremony in Melbourne. The award includes a commemorative medal and an overseas study visit.

An Australian engineering company, Andax Pty Ltd, is manufacturing and exporting the waxing machines. The value of machines sold so far is $5.5M and a smaller model has generated additional sales worth more than $1M.

From the Chairman

A column by Dr Keith Boardman

Recently, I had the opportunity to have discussions with Dr William Miller, the President of the Stanford Research Institute (SDI) and attend his address to a reception hosted by the Business Council of Australia and the Australian Science and Technology Council.

The main theme of his address bore a remarkable resemblance to the prophetic views expressed by our Minister in *Sleepers, Wake*, and expounded forcibly by him over several years.

The world economy has moved from a resource base to a knowledge base, with the message that no country today can effectively shield itself from world economic trends. There is increased emphasis on human capital and new knowledge with research becoming more important, but with the need to move basic research more quickly to the marketplace. The rapid advances in science and technology and the increased competition between countries mean that technologies are outdated more rapidly, and major retraining of the workforce, including scientists, is necessary. Dr Miller mentioned that the private sector in the USA is spending more on training and retraining than does the higher education sector.

Dr Miller said it was important for the private sector to increase its R&D, both intramural and extra-mural. If this is valid for the USA it is certainly a vital necessity for Australia with its low level of private sector R&D. Dr Miller considered that a role for government was to join with the private sector in making available accessible technologies.

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It was a pleasure for me to revisit the Project for Animal Research and Development (PARD) near Bogor, Indonesia, but there was a measure of sadness in taking part in a closing ceremony and tree planting (a eucalypt) to mark the end of the direct involvement of CSIRO staff after 12 years in the ADAB-funded project. Warm tributes were paid to the contributions and dedication of the successive Australian project leaders, and to the two main champions of the project throughout, Professor Hutasoit (now junior Minister for Agriculture) and Dr Ken Ferguson.

The research output of the laboratory has continued to grow steadily with the return of Indonesian scientists after training in Australia. CSIRO can be proud of its achievements in providing Indonesia with a first class animal production research facility . It is important, however, that the strong links of goodwill, friendship and co-operation which have been built between CSIRO and Indonesian scientists be maintained by regular contact.

Dr Ferguson and I were given a very great honour in a traditional North Sumatra Butak ceremony when beautiful hand-woven capes (ulos) were presented and placed on our shoulders by Professor Hutasoit. The talented Indonesian staff of the laboratory provided an evening of great entertainment in honour of the departing Australians, including a legend play, dancing and singing, with a moving rendition of auld lang syne.

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I would like on behalf of the Organization to express my appreciation of the outstanding contributions made by part-time members of the Executive to the performance of CSIRO. Over the years we have been extremely fortunate in being able to attract outstanding Australians, leaders in their own fields, to serve in the Executive and give their valuable time to contribute both inside and outside Executive meetings.

I would also like to pay tribute to the valuable work of the Advisory Council and State Committees, and the contributions they made to debate on important issues in CSIRO and to the decision-making process.

I wish all staff very best wishes for Christmas and the New Year.

A Keith Boardman

Big market expected for pump

A CSIRO-invented industrial pump which will find worldwide application in the manufacture of silicon chips and scientific instruments was shown to the November meeting of the CSIRO Executive. ***Story and photo on page seven.***

Health matters

A Noisy Lot

At the recent seminars on hearing protection, staff of the Occupational Health and Safety unit and many divisions were surprised at the extent and variety of noisy areas within divisions. Apart from obvious areas such as workshops, operations involving sample grinding, feed preparation, etc, generated noise levels often in excess of 115 dBA — about equal to jet engine noise!

With the recent issue of the CSIRO hearing conservation policy, the scene is now set for a concerted effort towards identification and control of noise at work.

We must all remain aware, however, that noise from recreational sources such as rifle shooting, hi fi equipment and rock concerts all add to our total noise exposure. Noise induced hearing loss is insidious and irreversible.

Audiometric testing of staff in at-risk areas (and other staff by invitation) will start in July next year, although a number of divisions have already commenced their own audiometry program.

Two Year Follow-Up Review

A follow-up review of the OHS area has been completed and will be presented to the Executive (Board) early in the new year. The 1983 review committee, chaired by Professor Craig, presented a blueprint for improved occupational health and safety within CSIRO. Much has been achieved in the interim with formation of new OHS committees, improved staff consultation, etc. The follow-up review does, however, highlight a number of key management and resource areas where further action is required. Copies of the review will be circulated to all divisions and units as a basis for further action.

Microscopy Study

A consultant ergonomist is being engaged by the OHS unit to study a variety of CSIRO microscope workstations. An increased incidence of occupational overuse injuries and postural disorders have been reported by staff spending long periods observing, dissecting, etc.

The consultant has been asked to produce a 'code of practice' which will highlight equipment, furniture and operational aspects designed to minimise health risks to staff.

Results are expected to be available early in 1987.

Farewell

The unit will be saying goodbye to Dr Cherilyn Tillman in mid Januaary. Cherilyn is leaving to take up the newly created position of OHS manager at Monash University.

Her experience and highly professional approach to occupational hygiene and OHS matters in general will be sorely missed. Maybe staff at our Clayton divisions will be able to keep in contact with Cherilyn in her new domain.

Gary Knobel
Manager OHS

Letters to the Editor

Dear Editor,

I had no idea when reading a press cutting earlier this year, describing how scientists cry 'Eureka' at the moment of insight, that I might one day have cause to hope for such an event to happen.

I was advised recently that one of my grandsons had Duchene muscular dystrophy (DMD), a genetic disorder. The only hope for DMD sufferers and their families is that a research breakthrough occurs.

Being an employee of CSIRO, I am aware of CSIRO scientists' achievements and I thought, perhaps naively, that a letter in *CoResearch* may lead to consideration of the DMD problem in 'off-duty' moments by my scientific 'colleagues', thereby increasing the chance of a solution being found.

Fred Lowson
Headquarters

Dear Editor,

In reply to Philip Sharp's letter (*CoResearch* no. 296) re. CSIRO logo, the Division of Textile Industry Social Club has been providing a windcheater/T-shirt with CSIRO logo for approximately eight years.

Philip's (and the editor's) knowledge of this service suggests our advertising has not been successful. May I indicate that our garments are of highest quality and the logo (see below) has been enthusiastically accepted by CSIRO members and visitors, especially overseas visitors.

If Philip and other readers would like to contact us we would be happy to supply as many garments as requested.

R H Smith
Division of Textile Industry

Science for Australia

CSIRO

Dear Editor,

Some of you might be interested in this version of the story of the Gordian knot.

Once upon a time, long, long ago, there was a large group of philosophers, alchemists, mathematicians, astrologers and others seeking Ultimate Truth. This army descended on the town of Gordium, widely rumoured to give much gold to scholars. But the way was barred by a rope across the road, with a large and intricate knot of Social Relevance in its centre. An aged sage in attendance told them the only ones worthy to untie the knot would be those whose studies had the greatest social relevance, as defined by zealots of the far left and of the far right.

Despair was written on every face as they examined the knot. Then their leader cut through it with his sword.

CSIRO needs the effrontery to tell society that a lot of research will not have much apparent or forseeable relevance, but that such studies should be supported anyway. There will always be some projects that can attract external funds, but there will also be others that have no chance of doing so. It is difficult to see how astronomy, for example, could be funded by groups with commercial gain in mind. Most projects in CSIRO fall between these two extremes.

As they say in the army, time spent on reconnaisance is rarely wasted. CSIRO is engaged in discovering more about the natural world. A small part of this research will result in discoveries of spectacular practical value. Much research will be useful to some extent. Some will never be of any practical value. How do we tell which research will be a winner? If we knew that we would not need to do any. **Cont. on p.7**

At the forefront of major advances in Australian marine science

Oceanography is one of the newest divisions in CSIRO. Its creation in 1981 arose out of the recognition of the urgent need for improved understanding of the huge area of ocean (more than seven million square kilometres) for which Australia became responsible following the declaration of the 200 nautical mile Australian Fishing Zone in 1979.

This need had been highlighted by a number of high level Federal Government committees on marine science in the late 1970s, and by the CSIRO Ocean Sciences Review Committee, which recommended the separation of the former Division of Fisheries and Oceanography into two divisions.

CSIRO's involvement with marine science dates back to 1936 and the establishment of a fisheries section. In the early 1950s the Division of Fisheries enlarged its work to include physical and chemical observations of the ocean, and a Division of Fisheries and Oceanography was formed in 1956. This continued until the separation.

The two divisions moved from Cronulla to new Marine Laboratories on the Hobart waterfront during an 18 month period beginning early in 1983. At the same time, funds were provided for a multi-purpose research vessel, the *Franklin*.

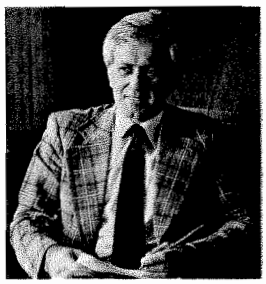
The Marine Laboratories now comprise the Division of Oceanography and the Division of Fisheries Research, which have separate scientific identities but share support facilities.

CSIRO designated oceanography a high priority growth area from 1980-84, and the division is now Australia's principal deep-sea oceanographic research facility.

It is headed by Dr Angus McEwan, a Fellow of the Australian Academy of Science and Australia's delegate to the Scientific Committee of Oceanic Research (SCOR). Before his appointment as the foundation Chief, Dr McEwan was a chief research scientist in the Division of Atmospheric Research.

The Division of Oceanography employs 81 scientific and support staff.

CSIRO meets Australia's main need for civilian oceanographic research in coastal, open and oceanic waters. The work provides information essential for territorial management, resource development and commercialisation and technology transfer (including marine instrumentation, space technology and numerical modelling). Fisheries, offshore construction, pollution control, navigation, climate research, defence and search and rescue operations are among activities assisted by the work.



Dr Angus McEwan

As the principal civilian institution in Australia capable of large-scale oceanographic research in the field, particular responsibility is taken for studies beyond the charter, capability, resources or expertise of other national organisations.

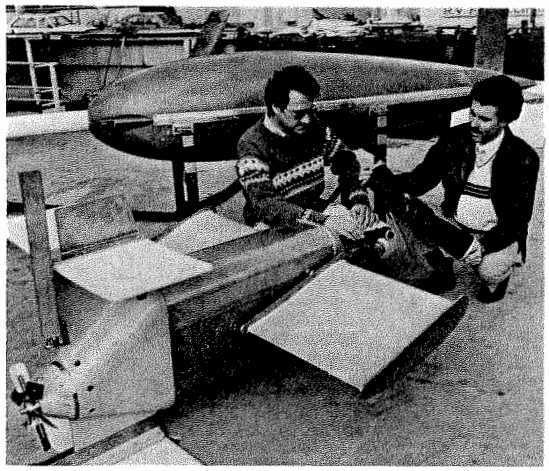
There are two major programs: physical oceanography, involving studies of the properties, structure and movement of Australian regional seas, and chemical oceanography, which deals with the characterisation of water masses and chemical processes in the oceans.

The Division conducts research throughout the Australasian region. Current areas of investigation include the equatorial western Pacific Ocean, the Coral and Tasman seas, Bass Strait, the Indian Ocean off Western Australia, the Timor Sea and the Gulf of Carpentaria.

The Division of Oceanography is young in years, but what it lacks in age is made up for in the enthusiasm of its staff who have come from many parts of the world to contribute to, and derive benefit from, what is regarded as one of the most productive and challenging periods in the history of Australian marine science.

The Submersible Data Logger in use for fisheries research. Photo: Thor Carter.

Wombats and Bunyips among new ocean research tools



Dr Trevor McDougall, right, senior research scientist in the small-scale ocean processes section, and Mr Alex Papij, OIC electronics, examine Bunyip equipment on deck of RV Franklin before the first trials in August this year.

Several instruments developed recently by the Division have attracted both national and international interest. The Division has a policy of actively pursuing commercialisation of instrumentation or techniques developed for research purposes.

The Submersible Data Logger (SDL), a versatile instrument for measuring several important water variables including salinity and temperature, is now being manufactured commercially by Yeo-Kal Electronics of Sydney. The SDL, a sealed cylinder fitted with sensors, can withstand harsh environments and permanent immersion.

It transmits data and charges its batteries inductively, through a plastic case. As a result, the unit needs to be opened only when sensors are being fitted for different applications. This minimises the corrosion problems of more conventional instruments and the necessity for trained operators, power supplies and the other paraphernalia that usually makes field measurements expensive, difficult and prone to failure.

Released commercially

The SDL was released commercially in 1986 and is already proving useful to scientists, including researchers in the Antarctic, environmental consultants and government departments concerned with rivers, water supplies and fisheries.

The WOMBAT (Weather Ocean Monitoring Buoy with Argos Telemetry) is a new type of marine meteorology buoy. The first one has just entered service and is another example of Australia's potential to produce more of its own marine equipment.

The original design from the Woods Hole Oceanographic Institution in the United States was modified for Australian conditions. It is discus-shaped, three metres in diameter, with a closed hull and central well for carrying instruments and batteries.

The WOMBAT is more stable and durable than other buoys in use in Australian waters, especially in areas with strong currents.

The Division has continued the 'Australian theme' with BUNYIP, a towed instrument for making rapid measurements of ocean turbulence. It can travel at greater depths than any similar instrument and is programmed to move in an undulating, saw-tooth flight path, which enables scientists to obtain horizontal as well as verticle profiles of the water column.

Freely falling instruments in general use only provide vertical profiles of the water column — and they are also very time consuming to retrieve.

Development of BUNYIP, which has just had its first trials, has put Australia at the forefront in the study of small-scale oceanic processes.

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This feature is designed to present a cross-section of activities at Oceanography and is not intended as a directory to the Division's research.

'The pride of the fleet' a valuable facility for marine scientists

The Oceanographic Research Vessel *Franklin* is the pride of the CSIRO fleet. She was commissioned in 1985 and is operated by the Division of Oceanography, with Hobart her home port.

Built at a cost of $12.2 million by North Queensland Engineers and Agents Pty Ltd of Cairns, the *Franklin* is a national facility available to all marine scientists investigating Australia's oceans.

She is managed by Associated Steamships Pty Ltd of Melbourne, with cruise schedules and scientific programs determined by an independent National Facility Steering Committee.

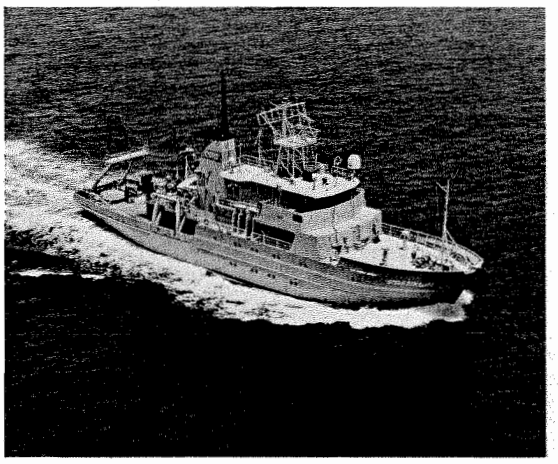
The 55 metre vessel has facilities for 12 scientific and/or support staff and 14 officers and crew.

Designed specifically to meet Australian requirements for a flexible, multi-purpose oceanographic research platform, the *Franklin* works mainly in the nation's territorial waters. However, her range of 7500 nautical miles (14 000km) also enables her to work in equatorial and subantarctic latitudes.

During her first year of operation, she was involved in a joint Australian-American Western Equatorial Pacific Ocean Circulation Study, studies of the deep bottom fauna of the Barrier Reef Shelf and adjacent Coral Sea, the origin of water masses in the eastern Coral Sea, changes in the earth's magnetic field between the continent and the ocean, and currents off eastern Australia and in the Tasman Sea. In 1987 she will participate in a multi-disciplinary study of the Leeuwin Current off Western Australia.

Work areas include a wet laboratory, chemistry lab, biology/general purpose lab, operations and computer rooms, electronics workshop, photographic darkroom, drawing office and library.

Franklin is equipped with an extensive range of state-of-the-art equipment, including an Acoustic Doppler Current Profiler, a powerful scientific computing network and a high accuracy Global Positioning System. There is also an INMARSAT satellite communications system which receives sea surface temperature images processed by the Division's satellite ground station in Hobart. With the aid of these images, *Franklin* now can be directed to surface features of interest revealed by imagery — another advance for what is already a high technology vessel of which the Division is justifiably proud.



RV Franklin

Division's futuristic HQ harmonises with historic environs

The CSIRO Marine Laboratories, Hobart.

The Division's headquarters occupies a prime site on the Hobart waterfront and architects from the Federal Department of Housing and Construction who were responsible for the futuristic design of the four new buildings paid special attention to the need for harmony with the nearby sandstone structures and historic environs.

Development of the complex in its conspicuous location, and the influx of personnel to Tasmania, has highlighted in the State the role and work of CSIRO around the nation.

In line with this increased awareness, the Division has adopted a higher profile in terms of community interaction. Journalist Jennifer Pringle-Jones, who has represented Tasmania in various capacities both in the media and in organisations such as the National Australia Day Council, was appointed in February 1986 as the Division's first full-time communication officer.

Closer links are being developed with local, State and Federal governments, industrial and commercial sectors of the community through events such as decision makers' functions. Small groups are invited to visit key research areas and to meet CSIRO staff associated with the programs. On a wider scale, the Marine Laboratories were opened to the public for the first time in October this year. As a result, at least 6000 people are more familiar with research being conducted in the complex.

Extensive media coverage of Divisional activities this year has included a segment on the ABC Quantum program, a series on the ABC Radio Science Show, stories in national daily newspapers and speciality publications, plus frequent reports in Tasmanian newspapers, ABC and commercial television and radio.

Communication group

A communication and information group established at the Laboratories includes scientific assistants to two chiefs, a scientific editor, a graphic artist, illustrator and photographer from the illustrations section and representatives of the Bureau of Information and Public Communication and the CSIRO regional laboratory in Battery Point, Tasmania.

Communication is very much a two-way affair and the Division is building on the solid foundations laid in the past two years to ensure that the community benefits from the increased CSIRO presence in Tasmania and, at the same time, that the Organization fosters input and advice from 'outside concerns'.

New initiatives to boost links with maritime industry

Offshore oil and gas production, shipping and fishing are major industries that rely heavily on knowledge of oceanic conditions on Australia's continental shelves.

While most research groups within the Division have links with various sectors of the maritime community, the oceanographic applications group is the major formal interface with maritime industry. The most important component of its work comprises the development of numerical models of several areas of the Australian continental shelf such as Bass Strait and the North West Shelf.

These models, which provide predictions of currents and sea levels associated with tides, winds and storms, are of considerable benefit to the offshore oil and gas industry. They also find application in the investigation of environmental problems caused by oil spills and ocean fallouts.

The group hopes to further strengthen the Division's links with maritime industry, and a number of initiatives are being pursued.

'Yes, but what do you do?'

When the going gets tough there are always some lighter moments to recall.

During open days at the Marine Laboratories in October this year some staff members were left wondering just what their work really involves. The following 'gems' are among the questions and statements with which they were confronted...

'And do you do any research here?'

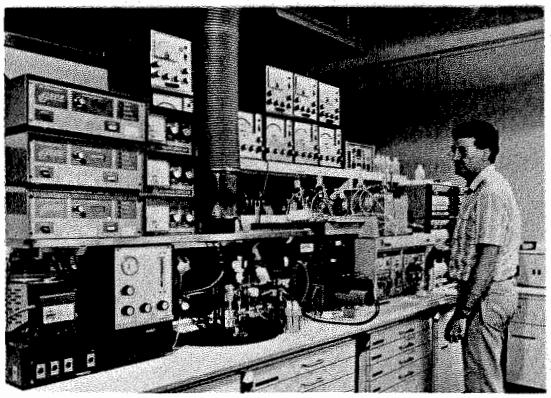
'I guess that doesn't work because it's man-made.'

'Where can I get cheap test tubes?'

'How about putting these young children in suspended animation?' (During a particularly busy period)

'Who would like to see my photo of 1929 whaling — one of me drinking a cup of tea on a whale's back?' (This enquirer was referred to Fisheries Research).

Chemical oceanography research uncovering useful new information



Dr Denis Mackey with equipment used for trace metal analysis.

Chemical oceanographers study the fundamental processes that affect the distribution of chemical compounds and elements found in different water masses.

Most of the compounds of interest are present in seawater at such low concentrations that highly sophisticated equipment and techniques must be used to collect and analyse samples.

Current research topics include studies of the effects of varying concentrations of trace metals, inorganic nutrients and organic compounds on the production of new biomass in the sea. For example, trace metals can be either nutrients or toxic to marine life, depending on concentration and speciation.

Other work involves the use of chemical constituents of marine organisms to trace food-chain relationships, and elucidation of the structure of dissolved organic carbon in seawater and the effects of this carbon on the growth of phytoplankton.

Members of the chemical oceanography group trace the origins and movements of water masses by the use of such chemical marks as nutrients and metals. This is useful, among other things, for studies involving the recruitment of southern bluefin tuna larvae of the North West Shelf and investigations of water-mass movements in the Tasman Sea in relation to the recruitment of lobsters and crayfish.

The Division is involved in the development of specialised techniques for measuring compounds at ultra-trace levels, and in studies of the sources and fates of organic compounds in coral reef and Antarctic waters and sediments. In this section, scientists examine the ways different bacterial groups degrade natural and pollutant compounds.

The information obtained by chemical oceanographers is directly relevant to studies of physical, biological and geological processes.

Jennifer Pringle-Jones, left, and Brita Hansen — a graphic artist in the illustration section — discuss the work involved in preparation and erection of a two metre high model on oceanography and applications of research in Australia. The display was made for the open days at the Marine Laboratories and is now a permanent fixture in the complex.

Sea/atmosphere interaction has profound effect on our climate

The oceans strongly affect climate — and Australia's climate is very sensitive to the temperature of the surrounding oceans.

The sea and atmosphere act strongly on one another in the tropics and this is believed to play a major role in year-to-year variations in the earth's climate.

One of the objectives of the large-scale oceanography and climate program is to understand why sea temperatures vary in our region.

The International Council of Scientific Unions, Intergovernmental Oceanic Commission and the World Meteorological Organisation have organised a major 10-year Tropical Ocean Global Atmosphere Program (TOGA). Between 1985-94 scientists from a number of countries, including Australia, the United States and France, are studying temperature changes in the ocean to increase understanding of the cause of oscillations of the ocean/atmosphere system, and to gauge the predictability of the system.

The Division is participating in TOGA by collecting sea level observations at stations in the tropical oceans, especially around Papua New Guinea, and sub-surface temperature observations along merchant shipping routes.

It has signed an agreement with the NOAA Office of Climate and Atmosphere Research aimed at co-ordinating international efforts involving the ocean temperature observing network.

Co-operative program

For some time the US, Australia and France have informally operated a co-operative program with merchant ships from which expendable instruments are deployed to record ocean temperatures to several hundred metres depth. However, this program suffered from lack of a reliable resource base. This will be rectified as a result of the new agreement, and plans for the future include the establishment of an international centre for the archiving and analysis of data from the program.

An international workshop was held in the Division at the end of November to plan further development of the volunteer merchant marine observer network.

Many studies indicate that heat storage in the upper ocean is the factor that controls the Southern Oscillation, a global seesaw in air pressure with its ends in the eastern and western Pacific. When this is coupled with El Nino, characterised by the warming of normally cold water currents off the South American coast, there are disastrous climatic changes in many parts of the world, including drought in Australia. The last episode in 1982/83 caused nearly $4 billion damage in Australia and $12 billion worldwide.

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Big waves can generate lots of megawatts

Dr Chris Fandry, left, explains the wave rider buoy to visitors.

In July 1985, the Division began to measure waves off Cape Sorell, near Strahan, on Tasmania's west coast. These waves have a 'fetch' (the distance in which waves have to grow) that is one of the longest in the world.

One reason for measuring ocean waves at a particular spot is to assess the wave climate (long-term description of the waves) in the locality. This information is particularly important to engineers designing marine structures such as wharves and oil drilling platforms: they need to know what sort of waves to expect statistically during the lifetime of the structure.

The energy carried by waves is another important aspect of wave climate. Energy from the wind over vast areas of the ocean is accumulated by waves, which carry it for long distances. The Norwegians have demonstrated that this wave energy can be converted reliably and economically into electricity.

CSIRO research has shown that the average power dissipated by waves along 53km of the west coast is equal to Tasmania's total installed hydro-electric capacity — currently 2055 megawatts.

The waves off Tasmania are measured with a Waverider buoy. This is attached to a fixed mooring with a rubber cord that leaves the buoy free to follow the water surface without allowing it to drift out of radio range. An accelerometer inside the buoy monitors the vertical acceleration of the buoy. The height of the buoy above mean sea level is computed electronically from the acceleration, and this information is continously broadcast by the buoy's radio transmitter and antenna.

On shore, the radio signal from the buoy is received and converted into digital form by a radio receiver. The receiver is interrogated by a microcomputer, which accepts the digitised wave-height data and saves it for display as needed. The largest wave recorded by CSIRO scientists in the 12 months to June 1986 measured 16.78m (55ft)from trough to crest. This occurred on 29 July 1985.

Chris Fandry & wave rider buoy

298-1986/87

Satellite technology keeps tabs on ocean buoys

The Division uses buoys tracked by satellite to reveal ocean current patterns and to relay environmental information.

The program began in 1972 when a CSIRO spar buoy carrying a transponder was tracked by the French 'Eole' satellite. From 1975 the tracking was done by NASA and since 1980 it has been done by the French 'Service ARGOS'.

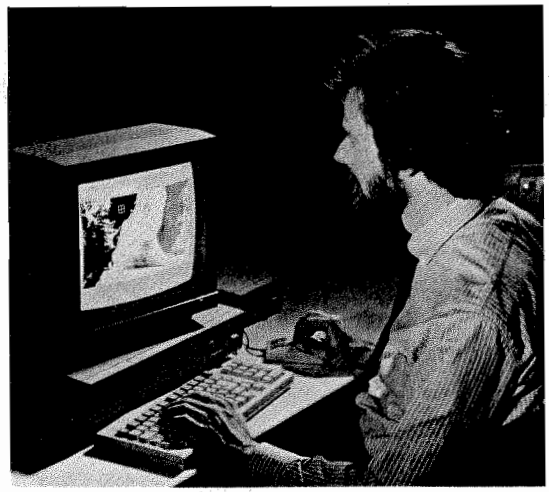
The buoys have been used with notable success to reveal, among other things, the dynamics of the Leeuwin current and the eddies of the East Australian current system.

The buoys, which have evolved over the years into a torpedo shape, are locked to the ocean currents by parachute sea anchors or drogues at the end of 50m tether lines. The transmitters for the buoys are bought from France and the circuits for solar charging the batteries and for temperature measurement are designed and built in the Division in Hobart.

Pressure sensor

It is planned to add an atmospheric pressure sensor as a module to the present buoy. In addition, a prototype drifting buoy incorporating a vertical profiler is being built to log temperature and depth on a probe that is lowered by a small solar-powered winch twice daily to a depth of 100m. On its return to the surface, the probe will transfer data to the buoy's microprocessor system via an inductive link. It will be charged in the same way. This link was developed for the Submersible Data Logger designed by the Division.

Thirty-five torpedo buoys have been used from the tropics to the Southern Ocean, with 30 being deployed in a joint CSIRO/RAN study of the East Australian Current from 1985-87.



Mr Paul Tildesley studies NOAA images.

More than a century of oceanography experience between them

Left to right, George Cresswell, Stuart Godfrey, Jim Dal Pont, Dave Crooks and Fred Boland.

What is youth without experience? Five Divisional members who have seen and contributed to many of the changes over the years are George Cresswell, Stuart Godfrey, Jim Dal Pont, Dave Crooks and Fred Boland. They have served a combined total of 114 years, and their areas of expertise include buoys, moorings, chemical analysis and computers.

David and Jim were the first to join oceanographic ranks, back in the late 1950s. Jim worked as a technical assistant in the hydrology section of the Division of Fisheries and Oceanography in Cronulla, where he analysed samples of seawater for chlorinity, oxygen and nutrients. Later he moved to the chemistry section where work over the years has included method development and analysis of suspended matter in seawater, investigations of mercury in the food chain and methods of determining this element in seawater, studies of metals and nutrients in pure water and, currently, determination of the copper complexing capacity of seawater.

Dave started computerising the data processing in the hydrology section at Cronulla in 1958 and when computers became more generally used he changed from data processing to giving program advice.

The first computer he worked with had 2000 words of memory and a card punch. Today, the equipment has eight megabytes of memory and discs with several hundred megabytes of store.

His main project at the moment involves programming eight microcomputers for data logging on board RV *Franklin*. He hopes to have an acceptable version within a month.

George, now a principal research scientist, and Fred, who heads the buoys and moorings section, have shared a number of experiences, especially during cruises on RV *Sprightly* during the 1970s. It was an important period that resulted in improved understanding of the Leeuwin Current off Western Australia and the East Australian Current, but some of their anecdotes also are worth recording. Fred has the distinction (and the considerable envy of his colleagues) of never missing a meal, whatever the weather conditions, for the entire 11 years of the *Sprightly* charter.

Then there was the occasion when the oil-fired stove in the galley caught fire. George reports that the pilot was very cool and collected, and when the smoke became too thick in the wheelhouse he simply opened all the portholes while continuing to say things like 'steer eight zero'.

George has played an important role in the development of satellite-tracked buoys and is one of the investigators for the 1986/87 Leeuwin Current Interdisciplinary Experiment (LUCIE). This has three aims: to better describe the current and to understand the processes that drive it, its role in the combined ocean/atmosphere system and in the life cycles of commercially-important marine species, and to build mathematical models for current predictions.

Moored instruments and drifting buoys are being used extensively for LUCIE and, as Fred points out, the Division's assets — including 40 current meters, 13 acoustic releases, eight tide gauges and two automatic weather stations worth a total of more than $850 000, are a far cry from the main equipment of a decade ago — 10 current meters built by the Division at a cost of $600 each.

Times have changed in other ways too. It's hard to believe that one vacancy could be advertised and three people would get the job.

That is what happened, though, back in 1969 when a copy of *Nature* carried an advertisement for the Division of Fisheries and Oceanography. A physicist or mathematician was required for studies of the East Australian current, and Stuart Godfrey, George Cresswell and Dave Webb all applied for the position.

'It had the ring of come and see the world,' said Stuart. 'To our surprise we were all taken on board. I concentrated on theory, George on observation, and Dave, who later went to the UK, did tidal work.'

In those days Stuart was among only three oceanography theoreticians in Australia. Counting students, there are now about 50 around the continent. As principal research scientist in the large-scale ocean dynamics and climate program, Stuart has a key role in one of the Division's most important areas of research.

Remote sensing revolutionises knowledge of ocean currents

It is generally well known that remote sensing plays an important part in the mapping and management of the Australian continent.

What is probably less well known is that data from environmental satellites are revolutionising knowledge of ocean currents around Australia because of their unrivalled ability to provide extensive spatial and temporal coverage.

The Division of Oceanography has developed a remote sensing facility to receive and process data from advanced, very high resolution infra-red radiometers on board the NOAA series of satellites, from geostationary meteorological satellites and from the Nimbus 7 spacecraft operated by NASA. Nimbus 7 carries a Coastal Zone Colour Scanner (CZCS) which senses subtle changes in the colour of ocean waters, enabling scientists to correlate information on the chlorophyll content in the surface layer with biological activity.

Information from the NOAA satellites includes data relayed from drifting buoys and emergency beacons.

The infra-red NOAA images, produced as coloured maps covering thousands of square kilometres of ocean at one time, show variations in the sea surface temperatures of as little as 0.2 degrees C, and features such as eddies, currents and fronts can be clearly distinguished.

The infra-red images are being used for an increasing number of applications by a wide variety of people, including oceanographers studying ocean currents, marine biologists studying ocean productivity, fishermen and yachtsmen.

CSIRO's largest ever exhibit

Orange Field Days a 'great success' for the Organization

CSIRO's $135 000 exhibit at last month's Orange Field Days appears to have succeeded in boosting relations between the Organization and sections of the rural community.

A conservatively-estimated 40 000 people visited the stands over the three days of the event, and among those surveyed for their response there was 'almost universal praise'.

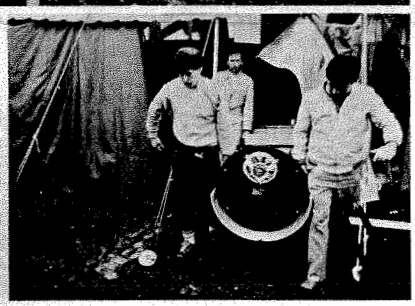
Research and information staff from 19 divisions participated and were on hand to speak to visitors and demonstrate various processes, such as biological defleecing of sheep.

Mr Nick Alexander, head of the CSIRO Film & Video Centre and co-ordinator of the survey of responses to the CSIRO exhibit, said direct contact between staff and a user group, and the presence of the Chairman Dr Boardman, generated considerable goodwill.

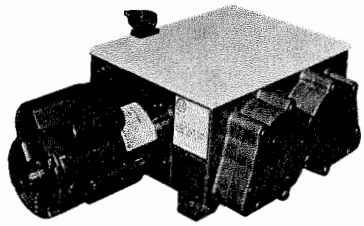
However, he pointed out the benefits will be 'mostly intangible'.

Project manager Dr Michael Dack said a large part of the success of the exhibit can be attributed to its 'corporate' nature. Nine major themes were identified, cutting across divisional and institute boundaries. These were: biotechnology, animal health, wool research, computers in farm management, remote sensing, quality of agricultural products, pests and weeds, soils and water and new pasture and crop plants.

Here is a pictorial account of CSIRO'a largest exhibit ever:



Vacuum pump Cont. from p.2.



The result of more than 15 years' blood, sweat and tears, the pump was presented to the Chairman, Dr Boardman (centre) by the international marketing manager of the US scientific instrument company, Varian Associates, Mr Kirk Nelson (left) and one of the three inventors, Mr Eck Bez.

CSIRO will be paid a royalty of nearly six percent on the pump, which will be manufactured in the US by Varian. It is estimated that royalty payments will grow to millions of dollars a year when the product gains a firm market foothold in a few years. CSIRO was unable to find an Australian manufacturer with sufficient research capacity, business resources or marketing expertise to commercialise the invention.

One Australian company, Repco Ltd, with which CSIRO has successfully collaborated on other projects, tried to develop the pump for two years, but decided late in 1979 not to proceed.

The pump is expected to gain a significant share of the $100 million-a-year US market for vacuum pumps, and will also be marketed in Europe and Asia. It was invented by Mr John Farrant, Mr Bez and Mr Karl Balkau of the Division of Chemical Physics. Its unique advantage is that it eliminates the need for cumbersome and elaborate safeguards against possible leakage of oil-derived vapours.

Letter Cont. from p.2

If our species persists for another million years, the cumulative benefit of research is so enormous as to be almost infinite. A pay back period on research effort of 10, 50, 100 years is nothing. We will only live to see a tiny part of the benefit, but we in our turn have benefited from experimentation in the past, by people now long dead.

The problem is to connect such an idea with short-term politics.

David Erskine
Centre for Irrigation and Freshwater Research

Gellie appointed to head SRI

Dr Warren Gellie, leader of the integrated manufacturing program in the Division of Manufacturing Technology since its inception in 1981, has been appointed director of the Sugar Research Institute. Dr Gellie left CSIRO last month to take up his post in Mackay, Queensland.

New ABC science series

The ABC will launch a new television series devoted to natural science early next year.

Called* David Smith's Earthwatch, *it will premiere on Monday, 16 February at 5.30pm. The 30-minute program will be hosted by a leading Australian zoologist, Dr David Smith.

The program will extend the scope of the current Earthwatch documentary series, and will cover worldwide environmental and conservation issues, as well as present a range of natural science topics.

Vale Alpo Metso

Mr Alpo Metso, *a senior technical officer with the Division of Fisheries, died recently. A colleague from the Division of Oceanography, Dr George Cresswell, supplied this obituary:*

More than any other person in the labs, he was one you felt you never really knew. And yet, he and I had a working relationship which lasted 15 years. He would build the satellite-tracked drifting buoys and I would use them.

Legends are made of the degree of his meticulousness and of his fairness to CSIRO.

Attention to detail meant that a buoy he built would, for example, put up with three years of pounding in the southern ocean while drifting from New Zealand to Chile, relaying to the satellite its position, battery voltage and sea surface temperature accurate to a 10th of a degree.

Alpo built more than 60 buoys. Many of these were rebuilt by him after they had been washed ashore and returned to us. Four of his buoys are now working in the open ocean; one is five years old.

As to being fair to CSIRO, he was to a fault. He would work many extra hours and weekends if he felt it necessary, and not tell anyone. He wouldn't claim for relocation expenses when he and his wife moved from Cronulla to the new lab in Hobart. Working for CSIRO was for him a great privilege.

Alpo came to Australia from his native Finland in 1970 and spent a year fitting two-way radios in cars. He then applied for a position with the lab.

He had spent time as a fitter in a factory, a member of the armed services and coastguard, a telegraphist, a shipboard radio operator and a technician for a company that installed and serviced equipment in lighthouses and beacons.

Alpo's concentration at his bench was total. He would frown and scowl as he peered into his circuitry. I would come along and he would stand up and break into a lovely smile, and then I would would try to penetrate his shyness and get him to talk about what he'd been doing.

He was 52 when he died.

Staff video wins national award

At the International Television Association's recent annual presentations, the second CSIRO *Connections* video was awarded a 'Silver Mobie' for best program in the category 'Organisational News'.

The Mobies are awarded to programs which 'combine creativity with high production skills resulting in a program that clearly and successfully communicates the message to the target audience'.

The ITVA will now enter *Connections* and other Mobie winners in the finals of the International Video Festival to be judged in Washington DC next May.

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***CoResearch* is produced by the Public Communication Unit for CSIRO staff. It's also issued to a number of people outside the Organization who are interested in CSIRO activities. Readers are invited to contribute or offer suggestions for articles. The deadline is the last Monday before the issue month. Editor: Liz Tynan, PO Box 225 Dickson ACT 2602. Ph: 48 4479.**

Retirements

Joan Jones has started long-service leave prior to retirement from the Division of Radiophysics. Joan arrived on the scene in 1974 and within a day or two we realised a veritable powerhouse of energy had been installed in the general office. The frantic speed and high accuracy of her typing was something to marvel at. In no time Joan became involved with the Benevolent Fund, the staff club, organisation of meetings — in fact whatever activity needed a boost around the lab.

Her ability at setting up the secretarial side of meetings was noticed by various presidents of the Astronomical Society of Australia and Joan was often invited to 'run the show' at many of the annual general meetings of the Society.

She took on the part-time job of business manager and increased the overseas subscriptions to the Proceedings of the Society from around zero up to nearly 300 during her term of office recently completed.

Joan has served on the editorial staff of SANA Update — the monthly newsletter of Scientists Against Nuclear Arms — since its inception in 1982. She intends continuing in that role during her retirement.

Dick McGee

The Assistant Chief of the Division of Chemical Physics, **Dr John Willis**, has retired after a career spanning 38 years with the Organization. Dr Willis joined the Chemical Physics section of the CSIR Division of Industrial Chemistry in 1948. His early work was on the infrared spectroscopy of molecules but in 1958 he joined Mr (now Sir) Alan Walsh in developing his new technique of atomic absorption spectroscopy. He was involved in developing AA methods of chemical analysis in a wide variety of fields and assisted many Australian laboratories to set up and use the new methods. Analytical atomic spectroscopy has remained his main scientific interest. In 1983 he was the first recipient of a medal established by the analytical chemistry division of the Royal Australian Chemical Institute.

He has been an active member of the Officers Association from the time he joined CSIR and served as branch treasurer and then chairman of the Victorian branch in the early 1950s. He was the OA's vice president and advocate between 1958 and 1962, at the time of the work-value cases for EOs, SSOs and engineers. He served as president in 1970-72 and was elected an honourary life member of the Association.

AATS admits five new CSIRO Fellows

The Chairman, Dr Boardman, was among five CSIRO members admitted as Fellows of the Australian Academy of Technological Sciences at its recent annual general meeting.

The others elected were: Dr John Raymond Freney from the Division of Plant Industry, Dr Albert Rovira from the Division of Soils, Dr Hari Sinha from the Division of Mineral Chemistry and Dr Brian Sowerby from the Division of Mineral Physics.

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New Sirotech arrangements

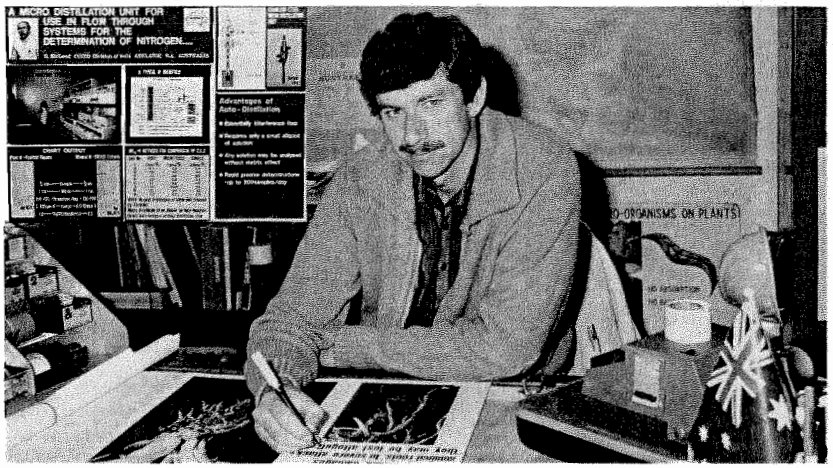
Sirotech has announced new structural and reporting arrangements.

The marketing and the technology communication divisions have been combined to form the marketing and technology transfer division.

In addition, three new groups have been formed, all reporting to the general manager. These are:

1. *Bio-Ag* — John Grace has been appointed business manager of this group, which will cover areas such as primary products, primary industry processing and vaccines.
2. *Minerals, Manufacturing and Information Technology Group* — Allan Foster is now business manager of this group, which will cover market areas such as mining and mineral processing, engineering products and information technology and electronics.
3. *Communications Unit* — Nancy Patton has been appointed manager of this unit, which will produce technology transfer journals such as Techlink and the innovation directory, arrange commercial awareness seminars and produce promotional materials requested by divisions, other clients and Sirotech.

CSIRO display gets overseas commendation



Staff in the drawing office of the Division of Soils in Adelaide, led by David Wright, are noted for the quality of their work. The specially coloured slides they produce for divisional scientists to use at seminars always generate very favourable comment and requests for information about the techniques used to produce them. Team member Greg Rinder has taken a particular interest in producing eye-catching displays. One of these, prepared for Stan McLeod of the Division, was judged to be the best in its section at the recent International Soils Congress in Hamburg, West Germany. Main photo shows Greg at work, while the inset shows the winning poster display.

CoResearch

CSIRO's staff newspaper

No. 299 February '87

First Board meeting

Jones: 'Excellence' not 'relevance' should be CSIRO catchcry

The Science Minister Barry Jones has called on the new CSIRO Board to ensure high standards of excellence and not to compromise with band-aid solutions to the problems of existing industries.

Mr Jones, who commented that 'securing the appointment of this Board is the most important public act of my life', outlined his hopes for the new Board in a speech at its first meeting two days before Christmas.

Early issues for the Board are the relative allocation of resources to sectors within CSIRO and the balance between short and long term research. In his speech, Mr Jones also warned against too much so-called 'relevance' as the main criterion for setting research priorities.

Here is the edited text of Mr Jones' speech:

The first meeting of the new Board of CSIRO is an historic occasion, not only for the Organisation, but for science and technology generally in Australia.

It is appropriate that we should be meeting in Melbourne, just 60 years after the Council for Scientific and Industrial Research (CSIR) was established here. The new Board structure, with a part-time external Chairman and a full-time Chief Executive, is to some extent a reversion to the 1926-49 model.

I am delighted and relieved to have been able to recruit such a powerful and distinguished Board.

I do not understate the magnitude, or the urgency, of the task before you, although I may have understated them just a little in persuading you to join the Board.

The most important issue in Australia today is how to bring the country up to date, to come to grips with the full impact of the technological revolution which has been sweeping the Western world and Japan in the past 25 years. We missed the bus on being active participants in that revolution — we are heavy but passive users of its technology. We originate very little of it, we sell even less and until recently seemed almost incapable of grasping the implications for industry, trade, education, social welfare and our place in the world.

Eighty per cent of Australia's exports are in agriculture and mining (including some secondary processing), but in all too many areas we are exporting only the rawest of raw materials — and this at a time when world trade has been turning quite sharply towards manufactured goods, brand name, packaged goods, based on the elaborate transformation of raw materials. Ironically, this area of strength has often been associated with CSIRO's greatest traditional strengths, agriculture and mining. We have among the most efficient farming and minerals industries in the world, but in the late 1980s and 1990s these achievements, like patriotism, will not be enough.

These areas of CSIRO's strengths have been where sectoral problems are highly specific to the Australian enviroment, and where there have been identifiable and grateful users. This is in sharp contrast to the generic areas in manuacturing and service industries where producers/users rely on the international pool of science and technology. There are no microchips or robots designed for specifically Australian environments.

Australian science has very strong links with international science, as a major contributor, just as Australian industry is strongly linked to international industry in a dependent, subordinate role. However,

Cont. on p.10

They've got a hide

But that's not all they do at the Division of Protein Chemistry. Turn to pp.5-8 for details.

Maybe CSIRO should take to the streets to bring in much-needed research funds. Or at least take to the race track. That's just what New Zealand's Department of Scientific and Industrial Research (DSIR) has done with its sponsorship of a BMW 635CSI production saloon. The car, sporting the new DSIR logo, is part of an aggressive 'drive' to boost outside funding for its physics and engineering laboratory. Scientists are looking at design changes to improve the performance of the car. The lab has been told to earn $NZ1.5 million in the current financial year to balance its budget. As DSIR says, 'big improvements in the performance of the car could send out signals to attract more work'. Over to you, Mr Wran.

Aust Day honours

Several people who have been associated with CSIRO were honoured in this year's Australia Day honours list.

Former part-time Executive Member, Mr Hugh Morgan (Western Mining) became an Officer in the General Division of the Order of Australia (AO) for his service to the mineral industry and to the arts.

Three retired CSIRO scientists became Members in the General Division of the Order of Australia (AM). They were: Dr David David (formerly with the Division of Plant Industry), for service to science, particularly in the study of soils; Dr Maurice Mulcahy (formerly Groundwater Research) for service to conservation and to agricultural science; and Mr Don Alexander (formerly Horticultural Research) for service to primary industry, particularly plant propagation.

From the acting Chief Executive

A column by Dr Keith Boardman

A new era for CSIRO commenced with the first meeting of the corporate-style policy-making Board at the Commonwealth Offices in Treasury Place, Melbourne.

In his introductory remarks the Minister outlined the enormous task facing Australia in bringing the country up to date and to come to grips with the full impact of the technological revolution sweeping the advanced countries of the world. The Minister expressed great confidence in the future of CSIRO as a vital force in the regeneration of the Australian economy, and in the new Board. He insisted that CSIRO must maintain the excellence of its research at the forefront of world development, but with an appropriate balance between its activities and a commitment to the application of research results for the benefit of the Australian economy and of our society. He told the Board that it must address as an early issue the relative allocation of resources to sectors within CSIRO.

Mr Wran, in responding to the Minister's remarks said it was important for CSIRO to move into the mainstream of Australian life. He saw an early task for the Board to address the remuneration of CSIRO officers including intellectual property issues and the nexus between CSIRO and the Public Service Board. He noted the requirement in the new Act for the Board to prepare a strategic plan and for the Chief Executive to formulate an annual operational plan.

I was asked by the Chairman to outline my perceptions of the future directions for CSIRO, and if I were appointed Chief Executive how I would implement a strategy for CSIRO along the lines set out in the September 1985 document, *Shaping the Future*.

I said the future of CSIRO was crucially dependent on the Organisation's ability to continue to attract creative staff of the highest calibre, but our competitive position had worsened considerably with the fall in the Australian dollar and the decline of scientists' salaries relative to their counterparts in North America and Europe. Later in the meeting the Board decided to consider at a future date ways to attract high calibre expatriate Australian researchers back to Australia and also the incentive needed to encourage others to remain in Australia.

An important element of the strategy, which I strongly support, is to avoid excessive fragmentation of our effort and to concentrate our resources on fewer projects. I told the Board that it was imperative the resources allocated to a project were realistic in terms of the projected scope and time-frame for the research and its application or commercialisation. Each division of the Organisation must achieve an appropriate balance between short and long term research. I said there was considerable scope for researchers to be more entrepreneural in thinking about the potential spinoffs from their research results. A better appreciation of the commercialisation process through closer contact with the users of our research would lead to a more realistic assessment of the potential of research to lead to new or improved processes or products, or better management strategies for our environment, water resources and wildlife. Increased competition across national boundaries and the shorter product life cycles mean that research must be planned within realistic time frames.

I said there should generally be a more disciplined approach to the selection and planning of projects and the reporting of progress against agreed aims. There is also considerable scope for improving our project management skills through suitable seminars, and I will ensure that these are established with some urgency. I told the Board that projects which were assessed as being unlikely to reach their goals within a reasonable time scale would be terminated.

I said it was important to make managers in the private sector more aware of the role of technological innovation in the creation of national wealth, and CSIRO scientists had a role to play in this communication. Collaborative research with industry is the most effective way of achieving closer contact with the private sector, as well as achieving a greater financial contribution from the beneficiaries of our research. I mentioned the valuable work of the sub-committee chaired by Professor Clark to establish criteria for a systematic evaluation of the potential benefits of research, and the contract with McKinseys for a commercial assessment of the potential benefits for Australia of establishing a vertically-integrated rare earths industry.

I told the Board that there would be more attention to staff training and development to assist greater flexibility and mobility of staff and to improve CSIRO's management skills at all levels.

In answer to a question about CSIRO assisting small industrial firms to solve more routine problems of production I said that a small amount of 'panel beating' was acceptable on a cost-recovery basis but I favoured the formation of subsidiary companies like Sirochem for this type of work when an oncoming demand was established.

On a personal note, I was pleased to receive the full support of the Board as Chief Executive, and their recommendation will be submitted to Cabinet by the Minister. The question of the appointment of a deputy Chief Executive and the structure of the Institutes will be considered by the Board following the appointment of the Chief Executive.

To give Board members an opportunity to meet staff of the Organisation, the Board decided that its meeting would normally be held at a divisional location. Some Board meetings would be held over two days to permit evening social functions with staff and community leaders. It was also agreed that the Chairman and Board members, together and individually would visit divisions on an *ad hoc* basis and meet division chiefs and CSIRO staff at all levels.

A Keith Boardman

Gozho pump fund

The Gozho Pump Fund conducted last year through *CoResearch* (294, Aug. '86) has exceeded all expectations.

Mr Russell Porter from the CSIRO Film & Video Centre said contributions now total $2651.43.

This works out at about $Z3000 and is more than enough to buy a pump for the school.

Mr Chatikobo, the school principal, said the CSIRO response was 'like a dream come true'. The pump should be purchased and installed in the next few months.

Whatever money is left after buying the pump will be used to restock the school library.

Qantas backs study awards

Following an offer of support from Qantas, the CSIRO Study Awards have been expanded.

The national carrier has offered $30 000 worth of air travel for the current year, and the awards will now be known as the Qantas-CSIRO Travel Awards.

They are for staff who seldom travel overseas officially, to undertake trips of relevance to their work.

The awards for 1986/87 have gone to:

1. Malcolm Elsworth (Division of Atmospheric Research), who will study nitrogen oxides and peroxyacetyl nitrate analysis and calibration techniques in the US;
2. Peter Silk (Protein Chemistry), to study human resource management programs in scientific, technological and commercial organisation in the UK and US;
3. John Crowley (Textile Physics), to study developments in the US, UK and France in textile machinery and processes and to investigate industrial knitted fabric production in connection with filtration of power station flue dusts;
4. Zane Kachwalla (Radiophysics), to study British techniques of characterising semi-conductor materials and devices, especially GaAs, with the aim of making field effect transistors optimised for low noise and fast switching applications; and
5. Georgina Katsantoni (CILES), to study the editorial production and marketing practices of publishers in the UK, US and Canada and to investigate the role of new technologies, eg. electronic publishing.

Library services

Dear Editor,

Dr June Olley, recent recipient of the prestigious Award of Merit of the Australian Institute of Food Science and Technology, in an interview with *The Mercury*, Hobart, on 6 December 1986, generously acknowledged the assistance of CSIRO librarians Frances Barnes and Jill Adamski in the prosecution of her research.

While public tributes to librarians are uncommon and are therefore welcomed when they occur, Dr Olley's comments on the power and value of computer-based information retrieval systems manipulated by skilled information professionals is a message worth emphasising — in the interests of science, CSIRO and the nation as a whole.

Access to an ever-increasing range of databases is readily available to all CSIRO staff through the libraries of the CSIRO network which are supported by the Bureau's Information Resources Unit at East Melbourne. Anyone unsure of how to make best use of these services or requiring further information should consult their librarian or Dr Grahame Jackson (03) 418 7250, or Ms Charmaine Klass (03) 418 7320.

P H Dawe
Acting Manager
Information Resources Unit

Sweet FA

Dear Editor,

I only wish I could share R H Smith's enthusiasm for the Division of Textile Industry's logo for CSIRO illustrated in *CoResearch* No. 298.

In the North the public is either less genteel or perhaps a little sharper in its perceptions than in the south. Our indoor cricket team which proudly wore the T shirts at its games was subjected to humiliating cries of 'SFA' by its opponents.

Could Textile Industry come up with a better caption than 'Science For Australia'?

J E Vercoe
Tropical Animal Science
Rockhampton

Steedman support

Dear Editor,

The article 'Big waves can generate lots of megawatts' in the Oceanography division feature in the December issue of *CoResearch* unfortunately failed to acknowledge the support that the project has received from Steedman Ltd. This support has included considerable financial assistance for purchasing hardware and advice resulting from wide experience in the field of ocean wave studies.

George Cresswell
Principal research scientist & leader, physical oceanography program

A Matter of Opinion

This month's point of view column comes from the science reporter at the **Sydney Morning Herald,** *Mr Bob Beale.*

Every year, as the final jockeying for Federal Budget allocations gets underway, journalists' telephones start to ring.

Sometimes the caller has some inside information and wants to point a trusted media contact in the direction of a good story. But mostly the calls come from one special interest group or another, wanting publicity to help them in their fight for funds.

At other times, calls and letters come for different reasons. One wants credit for this, another wants to apportion blame for that, and yet another has an axe to grind.

A union official might tip off an industrial reporter about an impending strike, perhaps to put pressure on an employer to negotiate. A conservation group might call an environmental reporter to sound an alert on a brewing battle with a developer. A group of disgruntled teachers may write to an education reporter complaining about a lack of textbooks or classroom computers.

The best such contacts, from the reporter's point of view, impart information that will never be found in a glossy press release, or a stage-managed press conference.

It might, for example, be your classic plain brown envelope from an anonymous sender. By leaking documents and information in this way, some public servants have been able to make sure the public learns the full facts of an issue, facts a public agency or politician wants kept quiet out of self-interest.

Scientists, it seems, are a different breed.

In almost two years as a full-time science reporter on a respected daily newspaper, the number of such calls and letters I have had from my reporting 'constituency' have been abysmally few. At first I thought it was my fault. Perhaps I wasn't working hard enough at making personal contacts? Was I overlooking issues that scientists really cared about?

After wearing out a lot of shoe leather, consuming whole forests' worth of science magazines and journals, and listening to complaints from other journalists in my field, I am now convinced that the problem lies not with me but with the attitudes of many of the people I write about.

The Canadian scientist and broadcaster, Dr David Suzuki, recently put it this way: 'If I ran down the halls of the university announcing "I've just made a discovery that's going to cure cancer", none of my colleagues would call CBC and say, "get down here — we've got a real news story".'

Stories like that, of course, tend to emerge quickly anyway. After all, universities and organisations like CSIRO now rightly put great emphasis on publicising their successes, using professional public relations techniques.

But the growing Australian corps of science and technology journalists aren't interested only in big research breakthroughs. They want to know, for example, about working conditions, whether Government policies are appropriate, if some field of importance is being neglected, or to get an insight into trends and current debates on scientific questions.

Last year, my telephone did ring around Budget time, notably from a group of marine scientists who (rightly as it turned out) feared a cut in their research funds.

But they were calling too late. They should have been lobbying much earlier, and more actively throughout the year, informing the media (and thus the public) about their work, its significance, and its need for public support. In mid-1985, the then-Chairman, Dr Paul Wild, urged CSIRO scientists to speak out publicly to raise community awareness of the Organisation's activities. In the past, Dr Wild said, the internal advice was, 'when in doubt, don't talk'. Now the message is, 'speak out and let your voice be heard'.

Only a handful of CSIRO people seemed to have taken that message to heart. They have steered me onto some very worthwhile stories, not just about interesting research projects, but amusing incidents, contentious issues and personal concerns. They have been able to provide insights into CSIRO that often can be obtained in no other way.

It's not that most scientists are unco-operative when journalists call them. But from where I sit, they still seem to think that communication means morning-tea discussions and publication in small, specialist journals.

Times have changed. Australians are demanding that scientists lift their heads from their benches and talk about the impact and relevance of their work. If scientists don't bother to respond, who could blame the public for not bothering about them?

So, how about a call?

New joint venture

Network Automation to take Aust computer technology to world

CSIRO's fourth joint venture in just over a year was announced this month by the new Chairman, Mr Wran.

Techway Limited, a major international supplier of information processing technology, and CSIRONET have established a joint company to market internationally Australian-made and developed computer communications systems.

CSIRONET owns 40 per cent of the new company, called Network Automation Pty Ltd, and Techway owns 60 per cent.

Network Automation is aiming for a 10 per cent share of the world market for computer communications, which is predicted to exceed $1 billion annually by the end of the decade.

The first international distribution agreement, covering Hong Kong and the People's Republic of China, has been established.

Australian-made

The company's first product will be Ultranode, a communications system almost totally Australian-made.

Ultranode, known as Micronode in CSIRONET, is a hardware and software package originally developed for use in the CSIRONET network.

The first node was installed in June 1983, and now more than 200 units are operational on the network.

The hardware was developed jointly by CSIRONET and Network Research and is manufactured in Canberra. The software was developed by CSIRONET staff.

Ultranode has already proved competitive in the marketplace. In September last year, CSIRONET won a $2 million contract for the data communications component of the $20 million South Australian Justice Information system. This was won against tenders from overseas companies.

Unlike communications systems developed solely for linking up personal computers, Ultranode can also link mainframes and mini computers across Australia or internationally.

'There are few products with its power and versatility on the world market today,' said CSIRONET general manager Mr David Glavonjic.

Mr John Paine, who has worked for 22 years with CSIRONET (or the Division of Computing Research as it was previously) has become director of software research and development for Network Automation. Several other CSIRONET staff will also move to the new company.

Mr Paine said one of the major problems facing large organisations in particular was computer incompatibility.

'The incompatibility is limiting their ability to respond quickly to the changing demands of the marketplace and their organisation.

'Before the development of products such as Ultranode, they were faced with the prospect of purchasing massive amounts of compatible computer hardware and software to overcome this problem' he said.

'Now they can keep their present systems and link them together using the Ultranode. It means that managers can regain control of their computer systems and use them to their best advantage.

*The Network Automation agreement is further evidence that CSIRO is forging stronger links with the manufacturing and services sector.

Since the Organisation's commercial agent, Sirotech, was established just two years ago, it has arranged more than 30 major collaborative, consultancy, licensing and royalty agreements for CSIRO, and advised the Organisation on another 400 agreements.

Now, four joint venture companies are operating. Apart from Network Automation, these are Z-Tech Pty Ltd, with ICI Australia, to market a range of zirconia products; Dunlena Ltd, with Du Pont Australia, to develop a range of CSIRO-invented pesticides; and Sirochem, with the Australian Mineral Development Laboratories, to provide chemical consultancy services.

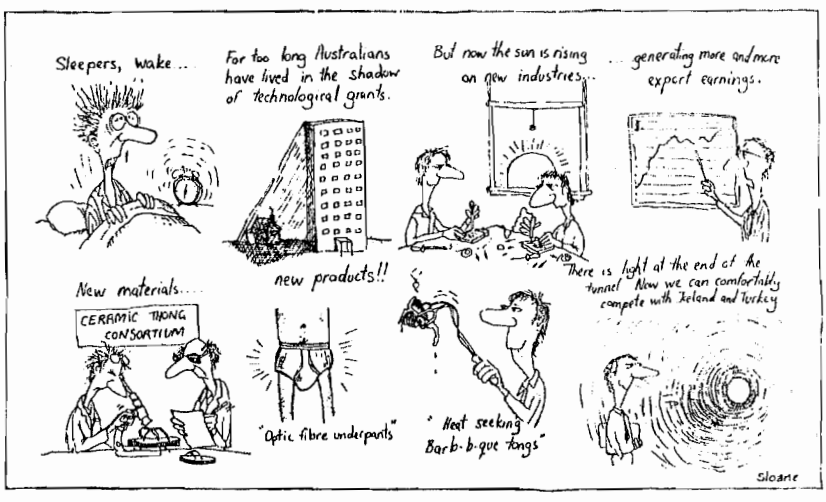
$100 million

It's estimated that the total investment in Australia as a result of Z-Tech and Dunlena, as well as other Sirotech-arranged marketing deals for Scrimber, new veterinary vaccines and a new fabric printing process, will be about $100 million.

Sales from these five ventures could reach $1 billion a year within 10 years.

The establishment of Sirotech has also led to a substantially increased level of provisional patenting.

In 1983/84, CSIRO filed 43 provisional patents, in 1984/85, 73, and in 1985/86, 71. Sirotech expects this trend to continue.



Of Equal Concern

In 1984 Parliament passed a law about EEO in the Public Service and statutory authorities such as CSIRO.

Under this law we must have an EEO program.

We also have to demonstrate that our EEO program is working. This is extremely difficult when we don't even know quite basic information about our staff.

While EEO programs are aimed specifically at four target groups (migrants, people with disabilities, Aborigines and Torres Strait Islanders and women) in reality they encompass ALL staff.

The EEO census is for EVERYONE. If you are not a member of the four target groups we need to compare your situation with theirs.

If you are a member of the four groups and have been successful we need to know that. If you have not been successful we need to know that too.

In other words, we want to compare everyone with everyone else to get a full and accurate picture of the entire Organisation.

WHEN? In May

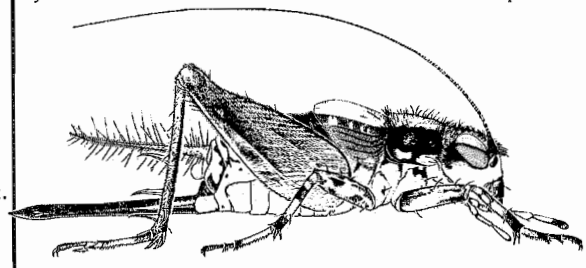
WHERE? In your own workplace.

HOW LONG? 30 minutes (promise!)

CONFIDENTIAL? Absolutely.

FRUSTRATION LEVEL? It's easy.

Carmel Macpherson



Insect book gets injection of funds

Production of the text *The Insects of Australia* by the Division of Entomology has recently received a very welcome injection of funds from several non-CSIRO benefactors.

Dr Phil Carne, the co-ordinator for the project, announced that substantial financial contributions totalling nearly $50 000 had been received from the Utah Foundation, the University of Melbourne, the Potter Foundation, Wellcome (Australia) Ltd and Melbourne University Press.

These funds will assist the production of many of the hundreds of new taxonomic drawings that are being prepared for the book by both CSIRO and private illustrators. The size of the project has necessitated the commitment of many divisional resources as well as the allocation of additional contract work. These donations will ensure that resources are available and that the project remains on schedule.

They will also further a major aim of the project — that of keeping the cost of publication down so it can be affordable for students.

The Insects of Australia is the premier textbook on Australian insects and is a standard reference for students and scientists around the world. Production of the revision of the 1970 first edition by CSIRO and Melbourne University Press has been planned as a major CSIRO Bicentennial contribution and the task is presently occupying the hearts and minds of many staff at Entomology.

Contributions are being received from specialists from around the world, although much of the work is being done by scientists of the Division.

Arrangements have also been made for the new taxonomic keys to be pre-tested by biology and zoology students in several universities. In keeping with the aims of the project both authors and editors have waived royalties.

The completed production will be an asset of considerable value to Australian entomologists and will help maintain Australia's position in the international entomological community. The venture is also a good example of the potential for collaboration between research establishments and industry, for the benefit of Australia.

Advertising campaign

CSIRONET makes big noise

As part of its drive to become more commercially oriented, CSIRONET has engaged a Sydney-based firm, Brand Management, to undertake an advertising and market research campaign.

The first advertisement (see above) was published in the Christmas issue of *The Bulletin with Newsweek* and the first three editions of that magazine in January. Further advertisements are planned for the rest of the year.

CSIRONET's public relations manager Ms Sue O'Connor said the aim of the campaign was to let potential customers know that CSIRONET was available to everyone and was a professional organisation concerned with providing the best possible service to its customers.

'Our preliminary research has indicated that even among data processing professionals, there is a low level of understanding of the scope and range of services offered by CSIRONET,' she said. 'Among senior managers, this level of knowledge and understanding is even less.'

'In many ways the current services offered by CSIRONET are a well-kept secret. We are trying to address the problem with this advertising campaign.'

Ms O'Connor said that as well as taking the message to potential customers, CSIRONET was trying to inform present clients of the changes occurring within the company.

'CSIRONET is a world leader in many aspects of the application of advanced information technology. This expertise is largely the result of work done in helping staff in many divisions solve their computing and research problems,' she said.

'Many CSIRO customers who have been using CSIRONET for many years may not be aware of the service upgrades that are continually happening. We invite them to contact CSIRONET staff if they have any queries.'

Basic science backs up very wide-ranging applications

Research in the Division of Protein Chemistry covers a range of activities from the determination of the molecular structure of proteins and genes at one end of the spectrum to the industrial processing of protein materials at the other.

The Division had its genesis in 1940 as the biochemistry section of the former Division of Industrial Chemistry (CSIR), with interests in the fellmongering (animal skin) and fermentation industries. Renamed the biochemistry unit, the entire section became a foundation laboratory of the Wool Textile Research Laboratories in 1949, totally financed by the Wool Research Trust Fund. In 1958 the unit became the Division of Protein Chemistry, retaining, however, its almost exclusive interest in research on wool.

The activities of the Division were broadened to include leather research in 1964 and proteins of agricultural, veterinary or medical importance in the early 1970s. The techniques of gene cloning and recombinant DNA research were established in the 1980s to support the development of biotechnology based products and processes.

The Division of Protein Chemistry now employs 131 scientific and support staff.

In 1980 all funds coming into the Division were from appropriation sources. Since then, restricted funding by government at a time when major new initiatives were being undertaken by CSIRO has meant that the Division must obtain contributory funds to maintain its research activities.

In the year 1985/86 the Division received over $1 million contributory funds and 'in kind' assistance, which is an indication of the mission oriented nature of the research.

The Division is headed by Dr Bruce Fraser, Fellow of the Australian Academy and an internationally recognised authority on the structure of fibrous proteins.

Proteins are fundamental components in any living system and in any product that was once alive. They are a significant component of much of Australia's primary produce — wool, hides, skins, meat, milk and grains for example. These are all bulk products that contribute substantially to Australia's export income.

Proteins are also key components of infectious agents such as viruses, bacteria and parasites. They are prime targets against which your immune system is directed when vaccinated. They are important constitutents of the defence systems of living organisms and serve many other important roles including those of enzymes, growth factors and hormones.

In short, proteins are intimately involved with all phases of the chemical and physical activity that constitute the life of a cell. They are also one of the keys to improved productivity and profitability in a range of important Australian industries.

Improved wool and hide processing technology, improved crops, vaccines and drugs to combat human and animal diseases, and new biological materials for medical and veterinary use, all offer major opportunities for local industry as well as significant benefits to the nation as a whole. They also depend on a fundamental understanding of protein science.

It is the skill to develop this understanding that the Division of Protein Chemistry provides. Its success can be measured in terms of the broad spectrum of industry and academic collaboration and the extent of financial support it attracts.

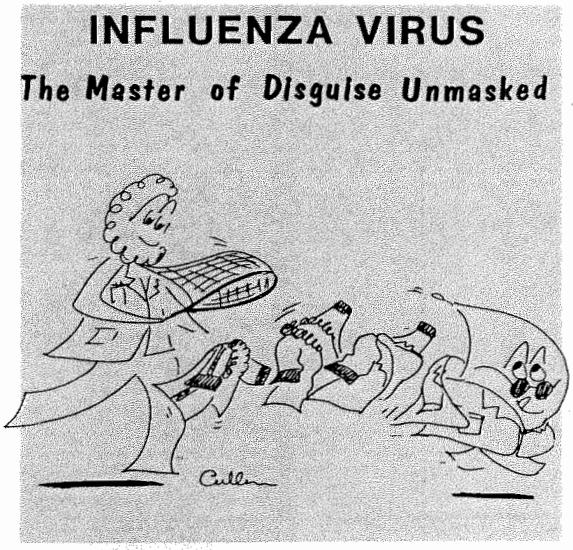
'Our aim has been to establish, maintain and support a complete spectrum of activities in the area of protein research and technology, including recombinant DNA and hybridoma technology,' said Dr Fraser. 'The unique feature of this Division is its diverse range of protein related activities and the comprehensiveness of the techniques and skills we have available.

'We have a brief to remain a centre of excellence in protein research and keep our equipment and our skills at the forefront of the field.'

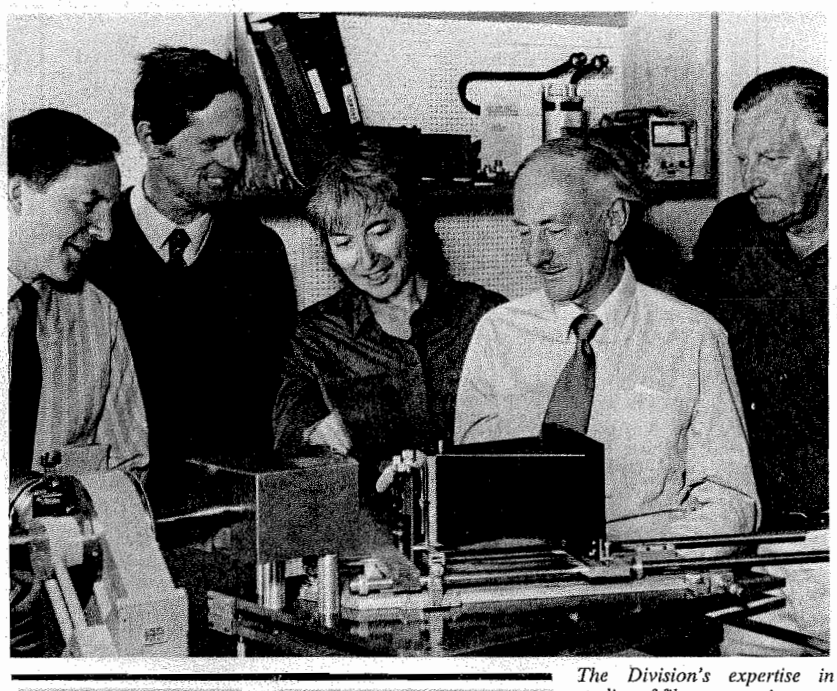
Recent highlights arising from the Division's research include:

* the signing of an agreement with Biota Holdings Ltd for a joint research project to develop influenza treatments, based on the determination of the three-dimensional structure of the neuraminadase coat protein carried out in the Division;
* the signing of an agreement with Biotechnology Australia and Arthur Webster Pty Ltd for a joint project to produce a footrot vaccine in conjunc-

Cont. on p.8



Research at the Division of Protein Chemistry into the flu virus has received national and international recognition. For the latest developments, turn the page.

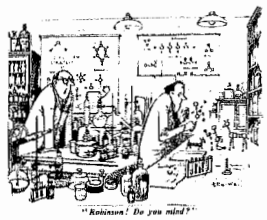


The Division's expertise in studies of fibrous protein structure attracts visitors from all over the world. From left, Prof. Andrew Miller, University of Edinburgh Medical School, Prof. David Parry, Massey University NZ, Prof. Barbara Brodskey, Rutgers Medical School USA, Dr Bruce Fraser, Chief DPC and Mr Tom MacRae, senior principal research scientist in the Division.

This feature is designed to represent a cross section of activities at Protein Chemistry and is not intended as a directory to the Division's research.

Next month we will have a feature on the Division of Mathematics & Statistics.

Photos in this feature were taken by Leona Monarch



DPC research programs

Chief: Dr R D B Fraser
Assnt Chief: Dr C W Ward

Wool & Fibrous Proteins
Leader: Dr R C Marshall

Hides, Skins & Leather
Leader: Dr N A Evans

Applied Protein & Gene Technology
Leaders: Dr C W Ward and Dr R J Blagrove

Protein Structure & Composition
Leaders: Dr P M Colman and Mr A S Inglis

The influenza bug — a master of disguise

Influenza has been called the last great plague of man. It continues to flourish today causing major epidemics that sweep around the world rapidly affecting a large proportion of the population regardless of age or previous infection history.

In this century major pandemics occurred in 1918 (Spanish flu), 1957 (Asian flu), 1968 (Hong Kong flu) and 1977 (Russian flu). In addition, severe epidemics occur almost annually in many parts of the world, causing severe illness and mortality.

Since 1933 it has been known that influenza is caused by a virus. When viewed under the electron microscope this virus is seen to consist of an enveloped particle covered by a dense layer of projections or spikes.

The interior of the virus particle consists of five proteins and eight segments of genetic material (RNA) while the outer layer contains two kinds of spikes or coat proteins. These coat proteins are called hemagglutinin and neuraminidase.

As with other viral infections such as measles, polio, mumps, rubella and smallpox, our immune system reacts to the influenza infection by producing special protein molecules called antibodies which react specifically with the two coat proteins of the virus. These antibodes help fight off the viral infection and should protect us from subsequent attacks.

Why then do we suffer repeated bouts of influenza throughout our lifetimes, and why can't we be permanently immunised like we can with smallpox, polio or rubella vaccinations? The answer is that the influenza virus is a master of disguise, constantly changing the structure of its outer coat protein so that they are no longer recognised by the specific antibodies present in our immune system.

The Division's achievements in the worldwide drive to find either a vaccine or a treatment for influenza are another illustration of the benefits of maintaining a centre of expertise in basic protein science.

Dr Peter Colman and his research group are experts on protein crystallography — the application of techniques like x-ray diffraction and electron microscopy to the study of protein structure.

One of their major interests is the interaction between antigens, like viruses, and the antibodies that the body makes to fight them. An invitation to collaborate with the Australian National University on a particularly interesting antigen-antibody interaction first launched the group into influenza research.

For many years, attempts to develop an influenza vaccine have been thwarted by the virus's ability to constantly change — vaccines against one year's strain are ineffective against the next.

Dr Colman's group has determined the detailed three-dimensional structure of a key protein — the enzyme neuraminidase — on the surface of the influenza virus. The group has shown that despite extensive variation from one strain to another, a key portion of the molecule is always the same. This site is a likely target for antiviral drugs or for a vaccine to combat the disease.

With financial support from a Melbourne company, Biota Holdings Ltd, and in collaboration with the Australian National University and the Victorian College of Pharmacy, both these possibilities are now being developed.

*Dr Colman was one of three recipients of the first CSIRO Medals, for his work on neuraminidase research.

Maximising potential of kangaroo skins

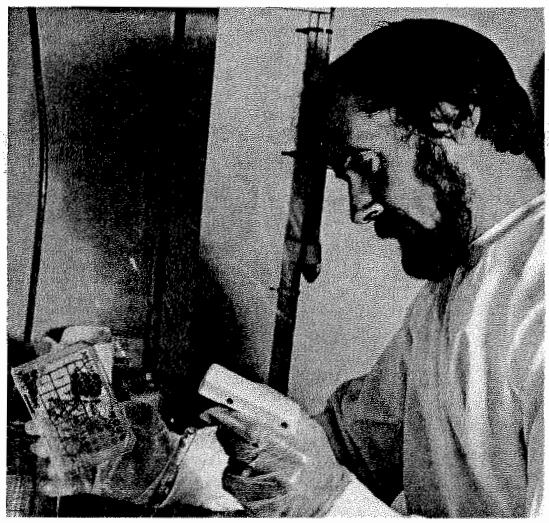
The supply of kangaroo skins in the world market is derived from culling in accordance with Australian wildlife management programs.

Studies carried out in the Division by Dr David Peters and Messrs Laurie Stephens and John Bavinton on the properties of the skin and the resultant leather from kangaroos has shown that this unique raw material has not always been used to its full potential.

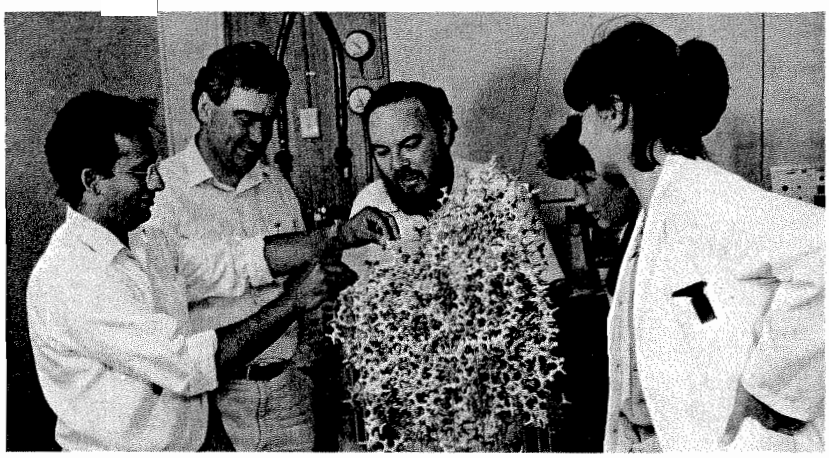
These skins can be used to make specialty lightweight leathers of high strength if care is taken in their selection and processing.

Because of these properties, leather made from kangaroo skins is particularly suited to sporting footwear applications. The project involves research into the selection of skins, processing variables and variation in skin strength over its entire area.

It is obvious that Australia has a unique raw material, which research can help boost as a valuable resource.



Dr Dean Hewish sub-culturing monoclonal antibody producing cells.



From left, Dr Jose Varghese, Dr Tony Baker, Miss Janet Newman and Miss Sonya Dayan discuss the model of neuraminidase, one of the coat proteins of the influenza virus.

Among many applications

Monoclonal antibodies could stop organ transplant rejection...

For many years it has been known that the immune system is capable of producing specific antibodies to almost any macromolecule foreign to the body of an animal.

Molecules with greater chemical complexity induce the formation of antibodies more readily than do simpler molecules, but it is possible to elicit antibodies to small organic compounds by linking them to larger carriers.

Proteins and complex polysaccharides are usually good antigens. The property whereby antibodies bind specifically to their antigen can be exploited as a useful research and diagnostic tool.

Serum from an animal made immune to an antigen contains a high proportion of antibodies to that antigen. The serum can be collected and used to detect the antigen in biological samples or artificial mixtures, and to measure antigen concentrations. With appropriate methods, the antibodies can be used to purify their antigens.

In 1973 research at Oxford led to the development of a technqiue which produces antibodies in cell cultures and involves the production of antibody-secreting cell lines; these cell lines could be cultured indefinitely in the laboratory and could be cloned to produce cells secreting pure antibodies for unique specificity. The fused cells are hybridomas, and the antibodies, monoclonal antibodies.

Viruses are the second most important pathogens of plants after fungi and Drs Dean Hewish and Dharma Shukla are working to improve plant-virus diagnostic techniques.

Plant material

Potyviruses (named after a potato virus) cause considerable damage to crop and pasture plants. Protein sequence work has shown that it should be possible to produce single monoclonal antibodies which recognise all, or at least large members of viruses within the group. These would be of importance to the agricultural industry and for Department of Agriculture use in testing imported plant material. Initial results from this project have been very encouraging.

Several collagen-based products are under development for use as prostheses in humans. These include synthetic artery and tendon transplants. The important factor in the success or otherwise of such artificial organs is the rate at which they are accepted by the body tissue and, particularly, are replaced by the living tissue of the recipient. Monoclonal antibodies to various collagens are under development by Dr Jerome Werkmeister for use in probes to obtain more

Artificial organs

information about host connective-tissue invasion of implanted artificial organs. The antibodies would be of considerable use in monitoring the success of various treatments designed to improve host acceptance of transplants.

Another project has started in collaboration with ICI's Immunodiagnostics Division. The project is aimed at producing a range of immuno-diagnostics for use in human and veterinary medicine.

Monoclonal antibodies are becoming indispensable aids in research and medicine, and in the future we can expect to see many more applications, not only in research but also in general medical, veterinary and agricultural practice.

...using 'spare parts' developed from research into collagen

One area where years of basic research in one field generated unexpected possibilities in another is biomaterials — artificially produced biological products for medical spare parts such as arteries and ligaments.

Many years of work on fibrous proteins and leather tanning had made the Division expert in the structure and function of collagen, the key structural protein of leather. It now turns out that collagen has enormous potential as the basic material for artificial blood vessels, ligaments and other body components needed as 'replacement parts' in modern medicine.

A novel form of collagen, resulting from basic work by Division scientists, has potential initially for the treatment of flesh wounds and as a haemostat to suppress bleeding. This material is now being evaluated in conjunction with the Victorian College of Pharmacy and an Australian company, Wallace Biomedical P/L. (A joint provisional patent has been granted to the Division and Melbourne University.)

The Division's expertise in tanning has been put to use to assist a small Melbourne company, Bionova Neotechnic, which produces two different types of artificial artery for revascularisation of limbs threatened with amputation due to poor blood supply. Ultimately the firm expects to be producing a replacement artery suitable for heart surgery, which would be the only biomaterials-based one in the world.

The chemical and biological inertness necessary in these artificial blood vessels is due to a combination of properties of the collagenous raw material and the tanning process used.

Other potential biomedical areas for collagen based materials, such as replacement ligaments or tendons, require further investigation of appropriate tanning methods to produce the desired properties. Fundamental studies on new tanning methods are being conducted with this end use in mind. Drs David Peters and John Ramshaw believe this type of development has the potential to capitalise on local technological skills and to make new products with high added value and possibilities for export earnings.

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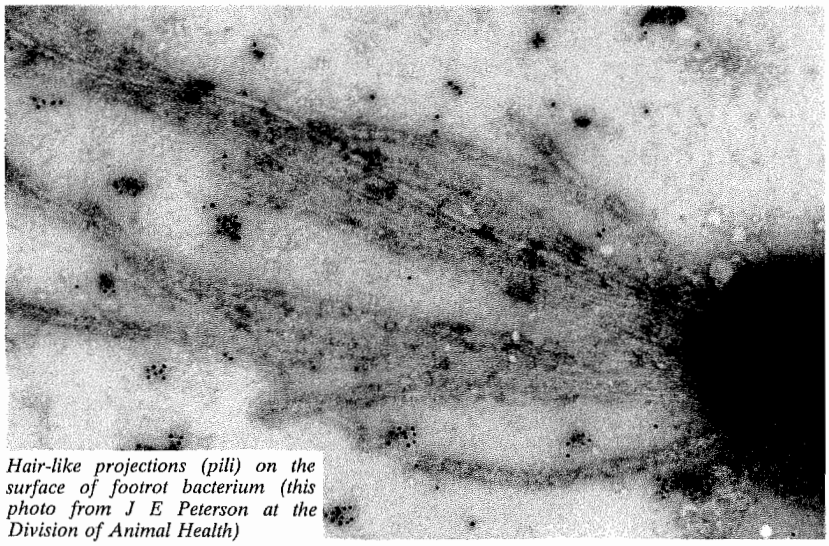


Hair-like projections (pili) on the surface of footrot bacterium (this photo from J E Peterson at the Division of Animal Health)

Strong ties with Australian leather industry

Since the inception of the hides, skins and leather program in 1964, a strong liaison has been established and maintained with the Australian leather and associated industries.

Scientists in the program led by Dr Neil Evans are encouraged to regularly visit all segments of the industry.

A technical committee of the Federated Tanners' Association of Australia meets twice a year, which enables representatives of the program to discuss, with industry representatives, problems where research effort may be warranted.

A CSIRO-Leather Industries Open Day is also held annually. This day is usually attended by more than 60 industry members from all over Australia. It provides a forum for presentation of current research findings, as well as another means of providing two-way discussion between scientists and industry.

This year there will be a highlight in the calendar of events for the Division and the local industry because, for the first time, the Congress of the International Union of Leather Technologists and Chemists Societies will be held in Australia. It's anticipated that in March this year some 250 representatives of the world's leather industry will meet in Melbourne to hear presentations on current research carried out by the leading researchers and industrialists from the major leather producing countries in the world.

The staging of this congress will be a tribute to the world recognition of leather research in CSIRO and to the dedication of the scientists involved in the program who have played a major role in the organisation of the congress. It will also help focus further attention on Australia as an important supplier of hides, skins and quality leather to the world market.

Dr Peter Gordon, left, demonstrates to industry representatives tanned woolskins produced by the new antifelting process (see story over page).

Research promises better footrot control

Footrot in sheep, caused by infection with a bacterium, is one of the three major disease problems of the sheep production industry.

Existing methods of control are highly labour intensive (inspection of hoofs, paring and footbathing) and the development of a vaccine promises better control.

Bacteroides nodosus, the bacterium responsible for footrot, has small hair-like projections called pili with which it attaches to animal tissue during infection. Work in the Division of Animal Health first established that these pili were the key antigens required for vaccination against the disease. In other words, the pili are key features of the bacterium to which the sheep's immune system reacts and manufactures antibodies.

However, the footrot bacterium is a somewhat fussy, slow-growing organism, making it difficult to produce vaccines by conventional techniques. The issue is further complicated because there are around 17 different strains and nothing was known about the molecular structure of the key antigen or the structural relationships between different serotypes. This has now changed dramatically.

The Division, using the latest genetic engineering techniques, has isolated and structurally characterised the pili proteins from key strains and the genes that code for them.

In 1982 Dr Neil McKern completed the amino acid sequence of the key vaccine antigen, the pili protein, from one serotype, and has subsequently obtained the comparative amino acid sequences of three other serotypes.

In 1983 Dr Tom Elleman and Mr Peter Hoyne successfully cloned and then sequenced the gene that codes for this protein. Since then they have manipulated the gene to get high level expression in *Escherichia coli* and *Pseudomonas aeruginosa* — organisms which are much more easily grown in culture than *Bacteroides nodosus*.

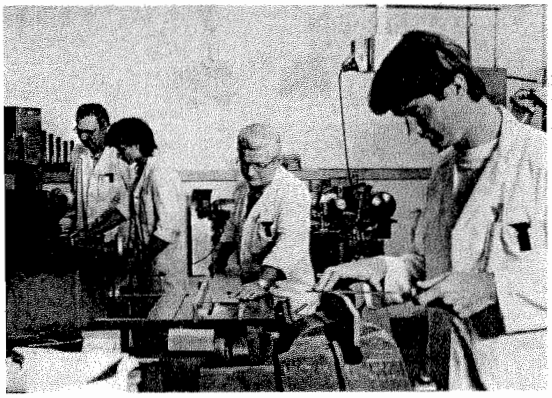
The product from *E. coli* is not correctly assembled as mature filamentous pili on the surface to the bacterium because *E. coli* does not have the appropriate recognition systems for processing and assembly.

Pseudomonas does possess these systems. The protein sequence data has shown that footrot pili were very closely related structurally to the pili of *Pseudomonas*, and indeed genetically engineered *Pseudomonas* were fooled into making and correctly assembling the footrot pili on the surface. The major collaborator in this project, Dr David Stewart of the Division of Animal Health, has shown that this recombinant product is very effective in vaccine trials.

A two year project to develop a commercial footrot vaccine began in June 1986 and involves the divisions of Protein Chemistry, Animal Health and Molecular Biology, as well as Sydney University and two Australian companies, Biotechnology Australia Pty Ltd and Arthur Webster Pty Ltd. The commercial deal was put together by Sirotech.

The project centres around getting the major footrot serotype into the *Pseudomonas* expression system. To date most of the genes have been cloned and several are now fully characterised.

DPC facilities



From left, Messrs Colin Ritchie, Justin Galea, Dan mcSweeney and Glan Tarran at work in the instrument laboratory which produces equipment ranging from x-ray cameras to small-scale tanning drums.

Extensive computing facilities in the Division for both research and administrative use are managed by Mr Bob Rowlands, foreground, and Mr Martin Pupedis.

Enzyme technology

Investigations have indicated possible benefits from the use of enzyme technology in wool textile processing.

Dr Lindsay Sparrow and his research team, in consultation with the Division of Textile Industry, have identified two industrially important areas with potential for biotechnological exploitation.

Raw wool contains three major surface contaminants — grease, suint (water soluable matter) and dirt. During early stage processing of wool more efficient technology is required in the removal of these contaminants, the recovery of wool grease and the treatment of effluent. Several novel sources of enzymes, able to hydrolise the major lipid class of wool grease have been identified.

Vegetable matter, such as seeds, stalks and burrs, is a common contaminant of wool and must be removed during or after processing. Current methods significantly degrade the wool so a cheap alternative technique is needed.

A number of organisms, mainly wood-rotting fungi, have been investigated for their ability to grow on burrs and seeds. The most promising of these is being further characterised for assessment as a method for removal of these contaminants.

Should any of the enzymes currently under investigation prove to be suitable, the Division's skills in biotechnology will be used to develop methods for large-scale production.

Overview
Cont. from p.5

tion with the Division of Molecular Biology and Sydney University;

* the development of the SIROLIME process for unhairing cattle hides, which has been hailed as a major advance in leather processing;
* the signing of an agreement with ICI Australia for the production of test kits, based on the Division's research into monoclonal antibody production;
* the launching, by Albright & Wilson (Australia) Ltd, of a novel class of co-polymer emulsions for bonding synthetic and cellulosic textile fibres and for water-based pigment printing, based on research at the Division; and
* the identification and structural characterisation of a sulfur-rich protein from pea seeds. This work, carried out in collaboration with the Division of Plant Industry, enables the transfer of the corresponding gene to produce sulfur-rich plants for animal feedstuffs which have the potential to increase wool growth in sheep.

In nearly five decades of operation, the Division has developed into a unique research laboratory with work ranging from computer-aided studies of the three-dimensional stucture of protein molecules to the 'gumboots and bucket' type research necessary for getting processes introduced into industry.

The ability of the Division to perform this diverse range of activities is a tribute to the wide-ranging expertise and the enthusiasm and dedication of all staff.

Solving technical problems should boost local sheepskin industry

Australia is a major producer of both cattle hides and sheepskins for world markets, with an annual production of around 35 million sheepskins, which is rivalled only by New Zealand.

These hides and skins constitute an important and valuable natural resource but, while it is generally known that Australia does not capitalise fully on the production of hides, it is not widely appreciated that there is also great potential for increased local processing of Australian sheepskins.

However, if this is to be achieved, it will be necessary to overcome a number of technical problems which are being investigated at the Division.

The problems arise largely from the nature of the Australian flocks, which are unique. The Australian sheep population is bred predominately for the production of fine wools and is dominated by Merino and Merino-cross breeds.

These sheep are generally killed at a mature age in the shorn state and, as a consequence, there is a high proportion of fine, short-woolled skins in the Australian production.

A major problem in the tanning of woolly sheepskins, especially those derived from Australian flocks, is 'felting'. This entanglement of wool fibres, usually in isolated clumps, results in the production of tanned woolskins of unacceptable appearance or feel. They are also subject to greater damage during combing.

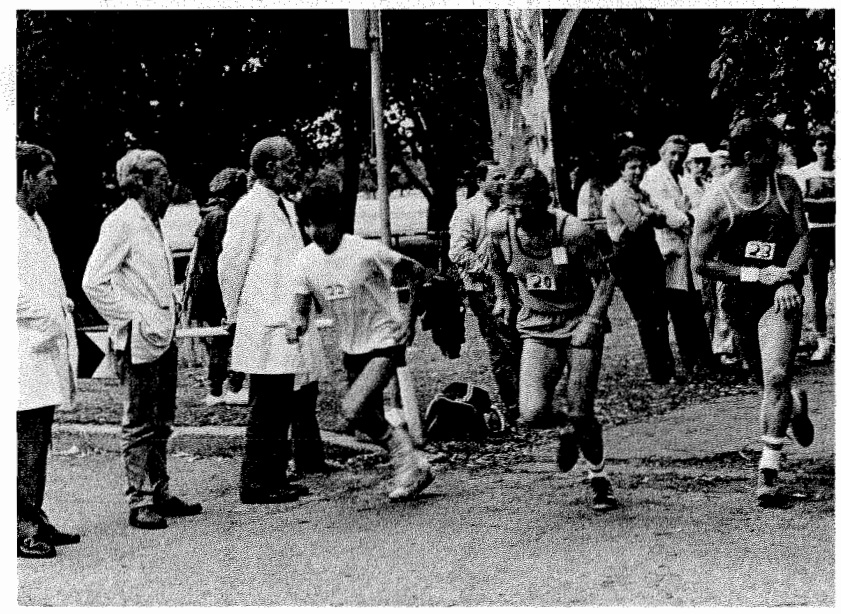
Despite adoption of techniques to minimise its occurrence, it is estimated that felting still affects around 35 per cent of total Australian tannery output. If felting could be avoided it is probable that about 20 per cent of tannery output which is currently disposed of as 'seconds' could be sold as 'firsts'.

A research project, undertaken by Dr Peter Gordon and his research team, aimed at identifying the cause of felting and providing a practical solution for tanners, has recently been successful.

The process developed by CSIRO is novel and incorporates some radical ideas which confer significant benefits.

It also utilises fewer steps in converting raw skins to the finished product. Pilot and tannery trials have confirmed the viability of the process, which is now the subject of a provisional patent application.

Division has fair share of masochists



Spectators and competitors at the start of the E F Woods Handicap.

Like a number of CSIRO divisions, the Division of Protein Chemistry has many devotees of the common form of masochism — jogging or running.

The Division is situated in Royal Parade, Parkville, which is surrounded by beautiful parklands. This has encouraged many of the staff over the years to enjoy the environment by leisurely jogging or strenuously running around these parklands. This pastime has been with the Division now for about 20 years and in 1969 a tradition began — the inaugural race, called the DPC Two Mile Run.

This tradition has continued and the event is held each year.

The only change that has occurred over the years is in the name. Rather than change the name to the DPC 3.218 Kilometre Run to keep in line with metrication it was decided to rename it the E F Woods Handicap in honour of Frank Woods, a scientist in the Division for some 30 years, who has officiated as timekeeper at the run every year, even since his retirement in 1984.

Another milestone (or should it be kilometre stone) has been achieved by two other scientists in the Division. Drs Jim Scroggie and Neil McKern have participated in the event every year since its inception with Neil holding the honour of fastest time every year, although he is now noticeably slowing down.

The run is held around November each year and the Division welcomes participation from budding 'Deeks' from other divisions.

New safflower lines bred by CSIRO at Griffith

Two new disease-resistant safflower varieties, *Sironaria* and *Sirothora* have been registered and will be available for commercial production during 1988.

The varieties originated from the breeding program at the Centre for Irrigation and Freshwater Research at Griffith, which set out to develop new varieties resistant to Alternaria and Phytophthora.

Sironaria will do well in areas of known Alternaria leaf blight infection. This is mainly in the northern areas where hot, humid weather is more frequent, but results from trials have shown that leaf blight is present in all states. *Sironaria* is also tolerant to Phytophthora root rot.

Sirothora is recommended for irrigation areas and should be grown on raised bed systems. The heavy soil types should suit this variety. It is susceptible to Alternaria leaf blight and would be better suited for southern districts.

Both varieties have been assessed in trials in Queensland, New South Wales, South Australia and Victoria. Before this, the varieties were subjected to experimental flooding at Griffith under extremely hot conditions during irrigation to establish that they would survive under commercial production.

The origin of *Sironaria* is from a complex of crosses involving selections from Poland and Iran, with Gila, the most successful Australian variety.

It is similar to Gila in plant type, seed colour and size, hull percentage, seeding vigour, leaf and bract spininess and flower colour. On average it is three centimetres taller than Gila.

Sirothora is from crosses of selections from Ethiopia and Turkey with Gila. Its plant type, seed colour, seedling vigour, leaf and bract spininess and flower colour resemble Gila but at maturity it is, on average, six centimetres shorter. *Sirothora* matures slightly later than Gila.

Basic seed distribution will be organised by a committee with representatives from the NSW Department of Agriculture, the certified seed producers, private seed companies and CSIRO. The distribution of seed will be co-ordinated by John Sykes, NSW Department of Agriculture, Dubbo.

Fast trees viewed by Minister

Fast growing eucalypts, part of experimental work by members of the Tasmanian Forest Research Group, were inspected recently by the Tasmanian Minister of Forests Ray Groom and the Warden of the Esperance Municipality Jack Kile.

The visitors were shown two experimental sites south of Hobart where the growth of several eucalpyt species has been studied intensively for three years since the trees were planted.

Though a combination of fertilisation and insect and weed control, spectacular growth rates have been achieved. Trees of the species most suited to Tasmanian conditions are now as tall as nine metres, which contrasts with the two-three metres normally obtained at three years of age.

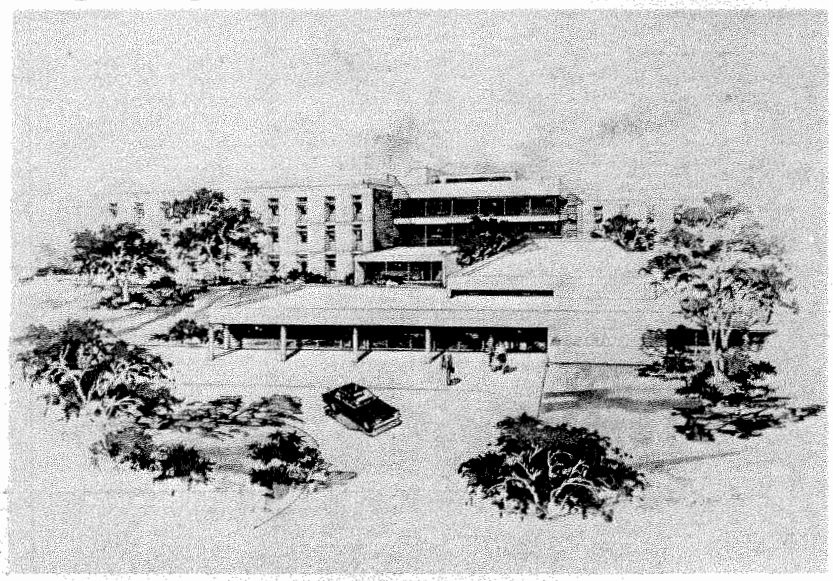
Forestry is a major employer in this region of the state, and Warden Kile was most impressed with the results of the research which illustrate the enormous potential for increased timber production in these forests. 'A three year old tree which is 10 metres high must be good news for the forest industry,' he said.

The experimental plantings are part of the research program of the Division of Forest Research which is attempting to determine what environmental factors limit forest growth and how these limitations are expressed in physiological responses by trees.

Dr Chris Beadle and his co-researchers Charles Turnbull, Trevor Bird, John Honeysett and Pat Hallam are studying various physiological and environmental processes in the experiment.

Tree photosynthesis and water use are being studied and related to the production of wood and living material by the trees.

Major upgrade of Floreat Park site



An artist's impression of the upgraded Floreat Park laboratories.

In recent years CSIRO staff numbers at Floreat Park, WA, have increased considerably, largely as the result of a decision in 1983 to create a Laboratory for Rural Research in the state.

In 1985 the Parliamentary Standing Committee on Public Works reviewed a proposal to build new rural research laboratories, to provide additional accommodation for minerals and geochemistry, to upgrade the existing laboratory built in 1966 and 1971, and to provide a new canteen and library.

The Committee reported that the existing laboratories and support buildings at Floreat Park were old, overcrowded and represented a significant occupational health and safety hazard, and recommended substantial upgrading.

Site works valued at $0.5 million were carried out in 1985/86.

A contract has recently been let for the construction of the new laboratories and common facilities for about $7 million.

After the new labs have been occupied a third contract, currently estimated to cost $2.3 million, will be let to upgrade the existing labs.

The sketch reproduced above shows new mineralogy labs linking the existing lab blocks, with the new library and canteen building in the foreground. The lab for rural research, which is not shown, is to the right.

Mr Ray Brookes of the building and property section represented CSIRO throughout the development of the project by the Department of Housing and Construction.

Toxins document

A CSIRO scientist recently took part in an international conference in Tashkent called to discuss the environmental hazard caused by pyrrolizidine alkaloids.

Dr Claude Culvenor, coordinator of the pasture associated toxins program at the Division of Animal Health, visited Tashkent at the invitation of the World Health Organisation.

He contributed to a task group responsible for preparing an environmental health criteria document on human health hazards from this substance. In Australia, pyrrolizidine alkaloid occurs in heliotrope, Paterson's curse and comfrey.

How to get space projects off the ground

'Getting into the space business' is the theme of a seminar organised by COSSA to be run during the International Technology Exhibition.

The newly-formed Australian Space Board has agreed to co-sponsor the seminar, which is being held at the Headquarters conference centre on 4 March.

The one-day seminar will cost $180 (including lunch), although discounted rates for groups of 10 or more are now available.

The aim of the seminar will be to show industry executives where the best opportunities lie for Australian manufacturing and service companies entering the space business.

A number of expert speakers from industry, research and government will address participants.

Beware of flying stalins...

Many readers will no doubt remember their days at school, when the study of science was new and often incomprehensible. Apparently it was more difficult for some than others. Here is a selection of exam 'howlers', which were recorded for posterity in the *New Scientist*:

Definition of fertilisation: 'The fussing of the male with the female garments';

'The hydra swims through water by waving its testicles';

'Mendel was unable to show virgin birth because of his lack of apparatus';

'Lots of chloroform helps photosynthesis';

'The zygote has 46 chromosomes. If it had 47 it would be a mongrel';

'The many aerosol cans found today are atmospheric pollutants. These are gradually forming a layer in the upper atmosphere which is believed to be stopping light from reaching the earth';

Dermatophagoides is a genus of mites that causes Seven Year Itch in man';

'When someone drinks water containing germs, he can become germinated';

'Asexual means reproduction through a disinterested party';

'A thermometer is an instrument for raising temperatures';

'Two muscles working against each other is called agonising';

'Menstruation is the shedding of disappointed ova'; and

Stalins migrate each year.

Barry Jones

Cont. from p.1

the direct links between Australian science and industry are very tenuous.

The quality and quantity of Australian research is high, but our national performance in applying it to industry has been abysmal.

CSIRO, as the largest recipient of Australian public research funding, must get better value from the research dollar by improving the quality and application of research and the quality of communication with actual or potential users. The different sectors don't talk the same language and there are disturbing examples of ideas which have been disregarded by CSIRO because they have not followed the orthodox communication channels. The Organisation must promote moods of open-mindedness and balance. This means more effective communication, liaison and collaboration between industry right across the board, and enhanced links too with universities and institutes of technology.

One of the early issues which you must address will be the relative allocation of resources to sectors within CSIRO, and determining priorities, including the difficult task of balancing resources between short term and long term projects.

I would not like to see any reduction in a commitment to excellence: there must be greater emphasis on excellence, the weeding out of programs that have had their day or are mediocre. I have never endorsed the view that the primary aim of the Organisation is to pursue 'relevance'; a word which always makes me uneasy. 'Relevance' changes with disconcerting speed, so that what was 'relevant' in 1975 or 1980 might look obsolete by 1986.

As I said in announcing the Government's response to the ASTEC report: 'While CSIRO will place more emphasis on the application of its research, it is important that its ability to contribute to future industrial developments is not inhibited by excessive attention to the short term needs of existing industries. CSIRO must maintain a balance in its activities, with a major emphasis on strategic research, while ensuring that its science remains at the forefront of world developments'.

With the 150 per cent tax incentive for R&D, CSIRO is potentially a major beneficiary, with industry shocked out of its torpor by its trade figures and a good deal of jawboning from Ministers, the climate is changing and there will be more commercial customers for research. Nevertheless, Australia won't have the luxury of just getting the 1980s right while our industrial contemporaries go charging off towards the industrial and technological bases needed for the 1990s and 2000s.

CSIRO will need resources, collaboration and understanding (very much a two-way process) from industry, but Arthur Birch was right to warn about the short-sightedness of the Rothschild Report in Britain which led to 'the dominance of the customer'.

Some of the most important applications stem from the most basic work. Every week I come across problems of great intellectual complexity in which basic and applied elements are inextricably linked.

CSIRO's emphasis should be creaming off the potential from basic research and selling it off; acting entrepreneurally. But CSIRO must not be merely a superior panel beating shop.

In the Government's response to the ASTEC report on CSIRO a number of matters were left to the Board to determine for itself and report to me, and others were left for me to examine and take action on, following consultation with the Board.

'...CSIRO must not be merely a superior panel beating shop...'

When the Science and Industry Research legislation was debated in Parliament, I gave two undertakings about some unresolved issues to avoid delays in passing the Bill, proclaiming the Act and establishing the Board.

These issues were:

1. CSIRO's statutory relationship with the Public Service Board. ASTEC recommended severance, the CSIRO unions are opposed, and the existing CSIRO management has no strong view. This is a matter for the Minister for Science to examine after consultation with the Board and relevant unions.
2. Intellectual property rights. This is potentially a very contentious issue and CSIRO will probably be a pacesetter for academia and industry. This is an issue for the Board to address, but as I told the House of Representatives, this could be referred to an arm's length enquiry, which might act urgently and briefly.

The Government accepted ASTEC's recommendation that 'Institutes relate primarily to existing and emerging industry sectors rather than to scientific disciplines' but the reorganisation of the Institutes is a matter for the Board.

The existing CSIRO Advisory Council and State and Territory Committees were abolished on ASTEC's recommendation. With a community based Board, what the Birch Report called the 'twin pillars' approach was neither relevant nor desirable. Nevertheless, you are encouraged to seek external advice and to set up appropriate non-statutory advisory mechanisms. Special attention will need to be given to Queensland, Western Australia, Tasmania and the Northern Territory which have no members on the Board. (The Australian Capital Territory has its own ways of communication).

Few organisations have been as much reviewed as CSIRO and its divisions. However, it has always troubled me that these reviews are essentially 'vertical' and fail to address the question of relative priority in funding or staff numbers. It sometimes appears that some relativity has been set, many years earlier — Division A has twice the resources of Division B, and decades on the proportionality is preserved. I commend the concept of 'horizontal' reviews to you, although I concede there will be problems in execution.

Early retirement, staffing policy and promoting personnel exchanges with industry and academia are yours entirely.

ASTEC recommended that the incoming Board should 'give consideration to transferring elsewhere research groups conducting pure basic research which is not linked to the major objectives of CSIRO'. I confess some scepticism about whether such research groups exist. Perhaps radio astronomy was in mind, but I believe the Division of Radiophysics is one of the jewels in your crown. It has given CSIRO an international reputation and has had a major impact on microelectronics, new materials and precision engineering.

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In summary I would remind you that CSIRO has a proud tradition, and to urge a new beginning is not in any way to deny or downgrade its past massive achievements. But the reality is that its (and our) past areas of strength are no longer enough in this turbulent and changing era. CSIRO can be a powerful force in changing Australia's direction and getting it right next time. But we don't have the luxury of time.

I have enormous confidence in the future of CSIRO and of this Board: CSIRO can become a mighty force in the regeneration of the Australian economy and, indirectly, of our society.

Yes, it's another caption competition

Following the outstanding response to last year's caption competition (remember what the artist said to the Chairman?), we are again calling for witty and/or wise remarks, this time to be attributed to these four gentlemen. By the way, they were participating in the annual North Ryde Laboratories' Fun Run. They are, from left, Mark Wright, Mark Wolfswinkel, David Nation and Wayne McDonald. Please send your entries to the editor, at the address shown on the back of this issue.

Closing the gap between the laboratory and the farm

Traditionally, farmers in Australia have been seen as slow to exploit the results of CSIRO research. But the resilience of Australian farmers and their capacity to diversify their operations in the face of increasing on-farm costs and unstable commodity prices shows this apparent reluctance to accept research findings is *not* because farmers are inherently resistant to change or new ideas.

It's more likely that the slow transition of research into farming practice is because the findings are not presented in ways which are relevant to or immediately usable by farmers.

Another likely reason is that CSIRO researchers often do not interact directly with field officers of the State departments of agriculture who have special skills in communication.

Two scientists at the Division of Animal Health, Dr Keith Dash and Dr Peter Waller, have set out to change this situation.

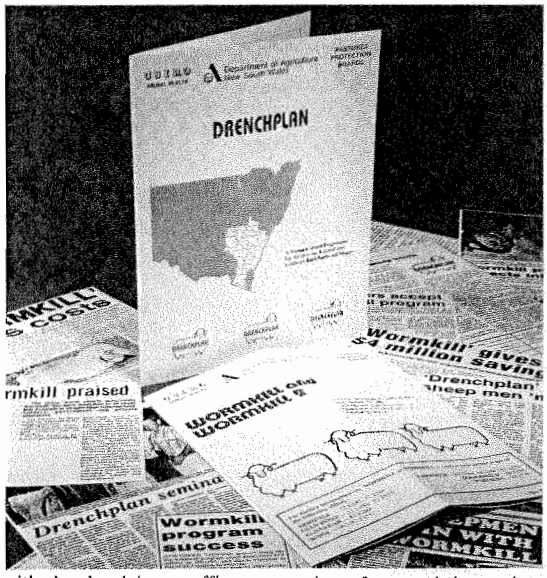
Together with field advisory officers of the NSW Department of Agriculture and local pastures protection boards, they have translated the results of the Division's research on worm parasites of sheep into two regional control programs which now cover the whole of the tablelands and slopes of the State — an area with a sheep population of 35 million.

The programs require fewer drug treatments than have been used in the past and aim to reduce the direct costs of worm control on a State-wide basis by at least 25 per cent — that is, by $5-6 million per year. They also aim to slow down the development of drug resistance in worm parasites which is becoming a serious problem in Australia.

The first program, 'Wormkill', was introduced into the northern tablelands of NSW in 1984. It's estimated that 90 per cent of sheep producers in that region are now using the program or variants of it. This represents a 50 per cent reduction in frequency of treatment and a cost saving of $2 million per year.

The second program, 'Drenchplan', has been introduced progressively into central and southern NSW, the last phase being completed in November 1986. Although no surveys have yet been made on levels of adoption, estimates from some districts suggest that 40-50 per cent of farmers are already using the Drenchplan program.

Effective communication has been the key to the success of both Wormill and Drenchplan. This has included the use of regional newspapers, national farm magazines, radio, television and mailed brochures. But particular emphasis has been placed on direct contact with producers at farmer meetings and field days. Dr Dash and Dr Waller, together



with local advisory officers, have conducted 75 such meetings throughout the State in the past two years. For many farmers it has been the first time they have met real, live CSIRO scientists face-to-face.

The reaction from within CSIRO to this communication exercise has been mixed. A few scientists have seen it as a costly exercise in marketing to the detriment of CSIRO's 'real science' image. But the fact is the results of CSIRO's research would have remained unused without it.

The question would then have to be asked, why was the research done in the first place? Just to amuse scientists, perhaps?

On the cost side, an examination of research inputs into the Wormkill program shows external communication to 30 June 1986 accounted for 5.5 per cent of CSIRO's expenditure on the project. As a result of this small outlay, the cost of 14 years of research effort was recouped in 12 months in terms of achieved savings by sheep producers.

Pastures protection boards and the NSW Department of Agriculture have also put a great deal of effort into the programs. In the northern tablelands alone, their salary costs in co-ordinating and servicing the Wormkill program were $236 000 in the first two years. Over the same period savings by sheep producers exceeded $4 million.

LITESLICE brings two honours to Applied Physics

The Division of Applied Physics, Hamersley Iron Pty Ltd and Aldetec Pty Ltd have received two major engineering awards.

The 1985 Western Australian Engineering Award and the 1985 Railway Engineering Award were presented late last year by the Institution of Engineers, Australia.

They were for LITESLICE, a computerised system that measures the profiles of rail and detects progressive wear. The system enables railway operators to check rail track for maintenance and safety purposes from a vehicle travelling at up to 80km/h.

An operational prototype of LITESLICE was developed at the Division by Mr Greig Small and Mr Zoltan Hegedus. The development was taken up by Aldetec with financial assistance through a Government industrial research and development grant.

Aldetec has made an initial sale of LITESLICE to Consolidated Rail Corporation in Philadelphia for $500 000, and a further two units are also scheduled for delivery to Canada.

The principles behind LITESLICE have a range of potential applications, with markets estimated to be worth $650 million.

Quarantine — 'it's not worth the risk trying to bypass the system'

Every year thousands of potentially dangerous biological samples — both animal and plant — enter Australia for scientific purposes.

Many of these are for CSIRO scientists and are vital for research programs in a number of divisions. Scientists have a responsibility to ensure that all procedures for importing such material are observed — and that's where the CSIRO quarantine service comes in.

Australia has an enviable reputation for being free of many devastating animal diseases such as rabies, foot and mouth, swine fever and Newcastle disease.

But holding back the tide is becoming increasingly difficult and quarantine officials now acknowledge it's no longer a case of 'if', but 'when' these diseases will invade our hitherto protected island.

CSIRO's quarantine officer for seven years, Mr Roy Pullen, has retired and the position is now occupied by Mr Lex Govaars, who transferred recently from the Division of Plant Industry's plant nutrition section.

The four-person quarantine/plant introduction unit headed by Mr Govaars exists to administer regulations concerned with the movement of scientific materials subject to quarantine screening in and out of Australia.

'Scientists are generally very co-operative,' said Mr Govaars. 'It's ignorance of customs procedures and the casual approach to completing declaration forms upon arrival which cause us the most concern.'

He said all scientists wanting to import biological material should ring first to check on the procedures and alert the unit to an impending import.

All plant material brought into the country must be registered, for which the unit maintains a registration databank administered by Sue Tibbitts.

This information is transposed and included in the Australian Plant Introduction Review publication together with relevant edited articles dealing with plant introduction aspects. The publication is distributed both nationally and internationally by request.

Marion Kilby, also from the PI plant nutrition section, joined the quarantine unit last year following the retirement of Lorly Allen. She looks after the seed store which distributes seed worldwide.

Long-time staff member Ru Baye completes the team as the specialist managing the glasshouse facilities for plant quarantine screening .

Not just seeds are dealt with, but also bacteriophages, cultures and now (increasingly) radio isotopes. Movement of these isotopes in Australia requires a licence, state/customs clearance and permission from the importing country.

'This is a new front in the quarantine process, and so far the unit has had reasonable success,' said Mr Govaars.

The unit provides a national service — not just for the Division of Plant Industry as sometimes perceived. Any division importing biological and/or radioactive material may contact the unit.

The unit is integrated with the Australian Quarantine and Inspection Service which operates throughout Australia.

'We do have occasional hiccups in the system, but we know where they may occur and we can rectify them quickly,' he said.

If scientists arrive back in Australia carrying material subject to quarantine they should hand it in at the quarantine desk at the airport and ask that it be sent to the unit in Canberra.

'It's not worth the risk trying to bypass the system or inadvertently forgetting to declare animal/plant products in your case,' he said, 'Some scientists have already discovered the risk can be costly following involvement in litigation through negligence.'

Litigation

There are 72 restricted seed genera which may only be brought into Australia under strict supervision. 'We are finding more and more species which present dangers to Australia. The unit must keep up to date with the latest additions to the list,' he said.

Diseases which quarantine officials are trying to keep out of Australia include: fireblight (a disease of pome fruit which is endemic in most other parts of the world), Pierce's disease, eucalyptus rust (which is well established in South America, the Caribbean and parts of SE Asia), sunflower downy mildew and plum pox virus.

Also, various insects and beetles in seed supplies pose a threat to Australian crops, forests or animals, eg. Khapra beetle in grain.

Samples surrendered to airport quarantine staff should be addressed to:

Plant Introduction/Quarantine Officer,
CSIRO Division of Plant Industry,
GPO Box 1600,
CANBERRA ACT 2601
For enquiries, ring 062-46-5483.

Retirements

The foundation Chief of the Division of Groundwater Research, Mr Ray Perry, has retired after nearly 40 years with the Organisation.

During his long career, Mr Perry worked with survey teams from the Division of Land Research and then headed the Rangelands Research Unit which was concerned with the pastoral country in Australia's arid and semi-arid zone. In 1973 he was appointed Chief of the Division of Land Resources Management in Perth, which also included the rangelands work.

In 1982 the Division was dissolved and Groundwater Research was formed with Mr Perry as Chief.

That Division has been absorbed into the new Division of Water Resources Research.

Mr Ray Perry

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Mr Ron Sherwood, a long time member of the Division of Materials Science (formerly Tribophysics and now Materials Science and Technology) has taken advantage of the Early Separation Incentive Scheme and ended his period of service with CSIR/CSIRO after more than 40 years.

Following several years practical experience with a firm of public analysts, Ron joined the wartime Lubricants and Bearings Section at Melbourne University at the beginning of 1945. On completion of a Diploma in Chemistry at the Melbourne Technical College he was reclassified a technical officer in 1947. Subsequently he became an EO (now ES) and throughout his long career was to provide a wide range of services from the testing and analysis of lubricating oils to the measurement of the surface areas of highly dispersed powders. He also took on the onerous task of managing the laboratory's chemical store, a job he performed for many years efficiently and with great forbearance.

The general area in which he worked involved mostly studies of solid surfaces and included such topics as the boundary lubricating properties of thin films of organic compounds, the mechanism of the etching of metals and the epitaxial growth of metals on metal substrates. Although Ron will be remembered best for the services he provided competently and reliably for his colleagues, his contributions to many of the divisional programs, although not often rewarded by co-authorship, did form an essential part of many of the successful pieces of research.

John Spink

End of an era

The widow of CSIRO's first full-time Chairman, **Lady (Janet) Clunies Ross**, has died. She was married to Sir Ian Clunies Ross who became Chairman in 1949 when the Science and Industry Act was amended to form CSIRO, and held the post until 1959 when he died.

Before her marriage, Lady Clunies Ross was on the staff of the Fisher Library at the University of Sydney. Shortly after her wedding she travelled with her husband to Japan, where Sir Ian (then Dr Clunies Ross) studied internal parasites of domestic animals. They returned to Australia in 1931, and Sir Ian became officer-in-charge of the new McMaster Animal Health Laboratory.

Long-time friend, distinguished CSIRO scientist Dr Helen Newton Turner, said after Sir Ian's death, Lady Clunies Ross undertook a course in criminology at Melbourne University and for some years worked as a criminology lecturer.

Her health had been poor in recent years. She entered hospital at the end of September after a bad angina attack, and died about a week later in her sleep.

She is survived by three sons, Anthony, Adrian and David.

Prize winner joins WRU to get some lab work experience

The winner of the 1985 BHP Science Prize is now working on a vacation project at the Wheat Research Unit in Sydney.

Maryanne Large, who has just completed 1st year Science at Sydney University, was asked to work at the Unit by the officer-in-charge Dr Colin Wrigley.

Maryanne won the Science Prize for her design of a new photographic tool which allows photographers to check the final quality of a photograph without the need for contact prints or proofs (*CoResearch*, March 1986).

Her work at the Wheat Research Unit is somewhat different.

The project she is involved with concerns iso-electric-focusing (IEF), a protein separation technique which could have application in medicine as well as wheat production.

Ms Maryanne Large

Proteins are amphoteric — ie. their charge is pH-dependent. IEF involves establishing a pH gradient between two electrodes, and allowing protein samples to move along this gradient until they reach a point where their charge is virtually zero.

This is called their iso-electric point and is different for each protein.

So far IEF has been done primarily on an analytical scale using synthetic ampholytes to establish the pH gradient. These, however, are very expensive and have all but prevented IEF being used for preparative applications. The alternative is to use a mixture of buffers to establish a gradient, and this what Maryanne is doing now.

Maryanne, who started work at the Unit on 1 December, will be there for about 10 weeks.

***CoResearch* is produced by the Public Communication Unit for CSIRO staff. It's also issued to a number of people outside the Organization who are interested in CSIRO activities. Readers are invited to contribute or offer suggestions for articles. The deadline is the last Monday before the issue month. Editor: Liz Tynan, PO Box 225 Dickson ACT 2602. Ph: 48 4479.**

40 year celebrations for two Animal Production scientists

Two scientists at the Division of Animal Production have each celebrated an important anniversary — 40 years with CSIRO.

Dr George Alexander, chief research scientist, and Mr Max Radford, principal research scientist, have made major contributions to animal production research in that period.

They both started working with Dr R H Watson in Melbourne, and later moved to the Ian Clunies Ross Animal Research Laboratory at Prospect, in 1954 and 1961 respectively.

The physiology and endocrinology of reproduction in sheep and cattle have been the subjects of Mr Radford's research. His findings have permitted better management and greater reproductive efficiency of these species.

Dr Alexander has devoted most of his research to studying the behaviour and physiology of new-born lambs and their mothers. This has helped to improve survival of lambs on Australian sheep properties, since it is the basis of the sheep weather alert broadcast to graziers. He is continuing with his research, but Mr Radford retired in December as part of the Early Separation Incentive Scheme.

Even after such long and distinguished careers, both are still finding new challenges. Dr Alexander has played a key role in the formation of the Animal Welfare Federation of Australia, and has been elected the first president of that body. Mr Radford, on the other hand, is a keen amateur pilot and intends building his own single-engine aircraft for leisure flying in retirement.

Wrigley gets Smith award

The Council of the Royal Australian Chemical Institute has awarded the H G Smith Medal to Dr Colin Wrigley, officer-in-charge of the Wheat Research Unit.

The medal is awarded annually to 'a member of the Institute who has contributed most to the development of some branch of chemical science', judged by research work published during the preceding 10 years. It is significant that this year, the contribution has been in the field of food chemistry.

Dr Wrigley's research, together with collaborating scientists, has mainly related to elucidating the role of specific grain proteins in determining the functional properties of cereal grains (particularly wheat) in food processing. This has involved developing improved techniques for fractionating and characterising grain proteins, some methods finding application in the identification of cereal varieties.

More recent identification of quality-related protein components opens the possibility of quickly estimating their presence with specific antibodies and of engineering quality wheats by manipulation of the genes for these proteins.

The H G Smith Medal was first awarded in 1928 to Sir David Rivett, who later became CSIR Chairman.

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Ted Sorani looks mean during his mental preparation for the big match at the Chemical and Wood Technology handicap table tennis tournament recently. The main event was won by Gwen Gniel from the Division.

Guest, Maryanne Large, won
1985 BHP science prize

CoResearch

CSIRO's staff newspaper

No. 300 March '87

New Chairman meeting staff 'at the rockface'

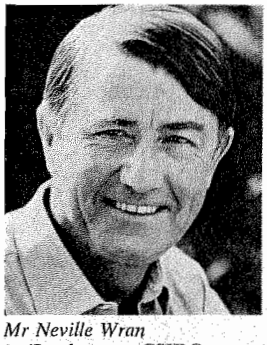
CSIRO staff will be seeing a lot of new Chairman Mr Neville Wran, as he acquaints himself with the complexities of the Organisation.

Mr Wran said he will be an 'interfering' Chairman — but he said that doesn't mean he intends being dictatorial or dogmatic.

He wants to meet the scientists and non-scientists 'at the rockface', talk about what they're doing and get to know more about what the Organisation does. Already he has visited a number of laboratories and many more visits are planned.

Chairman Wran is still on 'a sharp learning curve' and in order to do the job justice he is spending many hours involved in CSIRO matters — more time, in fact, than he originally thought would be the case.

Mr Wran had limited knowledge of the work of CSIRO before taking on its top job. Apart from nearly poisoning himself with chlorine when he was a child using his chemistry set, he has had minimal contact with the world of science.



Mr Neville Wran

'I knew CSIRO was Australia's dominant scientific research organisation, and that it had been largely responsible for Australia having one of the most efficient rural industries in the world,' he said.

'I knew it had contributed to the productivity and safety of mining, that it had tried to get rain from clouds, get rid of blowflies, etc.

'Apart from that, my only basis of information was Robyn Williams' science show on radio,' he said.

His early impressions of the Organisation were 'all good'.

'I'm impressed with both the intellect and the motivation of the professional and non-professional staff,' he said.

He wants to meet as many people as he can, particularly in this early stage, because 'it's a bit unfair to me and to the staff of CSIRO to be making pronouncements as if I'm really fully seized of the facts,' he said.

'I am not going to sit in my office and participate in decisions that affect CSIRO and its staff, just by reading documents.

'I'm going to go and have a look, talk to the people doing the work, or in the case of a problem, to the people involved. If I perceive something which I think is wrong — in terms of policy — or could be improved, then I won't be afraid to initiate a change,' he said.

'In other words, I don't see myself as the Chairman of a committee. I intend being an involved Chairman.'

However, he makes it clear that in no way will be attempt to interfere in the conduct of scientific research.

'What has to be understood is that the Board is part-time, with the exception of the Chief Executive. It is not concerned with the day-to-day management of the Organisation or in the performance and methods employed in respect of matters of science.

'Our role is largely to do with policy.'

He said he did not expect to have a role in decisions on the termination or commencement of individual research programs — 'that's a job for scientists, not me'.

'I've not the slightest doubt that the Board will examine the structure of institutes and the structure of divisions. In that process, it's possible, and I don't put it any higher than that, some changes will be made.

Cont. on p.7

Visits to Perth, Ryde

Mr Wran mixed business with pleasure during a visit to Perth to view the America's Cup race.

He met members of the former WA State Committee, joining them and senior CSIRO staff for dinner at the Marmion laboratory of the Division of Fisheries Research.

He also visited the Floreat Park and Helena Valley sites. He is pictured below (front row, second from right) with members of the former committee, from left, back row Mr Ed Gorham, Dr Darryl Hull, Mr John Brophy, Dr Jim Ross, Dr David Balfour, Dr Don Saunders, Mr Bob Hillman and CSIRO Board secretary Dr Ted Cain.

(front row) Professor Bob Street, Professor John de Laeter, Dr Patricia Kailis.

Later in February he 'slipped quietly' into the Energy and Earth Resources laboratory at North Ryde in Sydney.

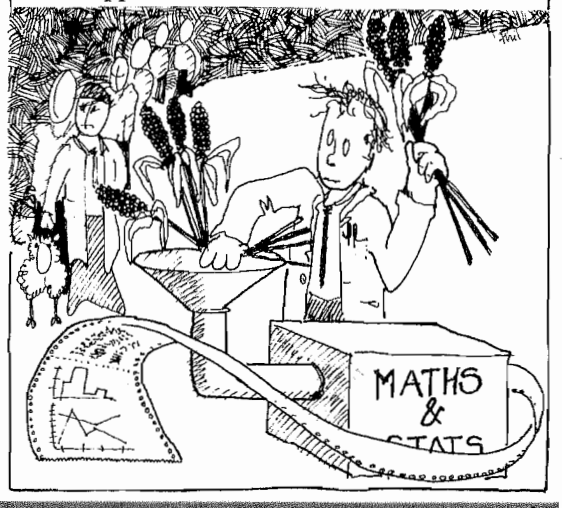
He was greeted by Dr Brian Embleton (Chief, Mineral Physics and Mineralogy) and Professor Ming Leung (Chief, Fossil Fuels) and went on to meet a gathering of Chiefs from other nearby divisions for an hour's informal discussion.

The meeting was followed by visits to several laboratories, and he is pictured with Dr Leo Lynch meeting a scientist in the coal research laboratory.

BHP Science Prize

Twelve year old Stephen Murphy of Melbourne, above, last month became the youngest ever winner of the BHP Science Prize for excellence in scientific research by school students. He won $5,000 for his computer simulation of dam siltation rates in glacial rivers, developed after a holiday in New Zealand. Second prize of $1000 went to Suzanne McGrath, 14, of Sydney, for her study of second wind, pulse and inhalation rates of fit and unfit children. Stephen and Suzanne also won a trip to Puerto Rico to compete in the International Science and Engineering Fair. The Science Prize is organised by CSIRO, BHP and the Australian Science Teachers' Association with support from Westinghouse.

The gentle art of number crunching...this month's division feature highlights the work of the Division of Mathematics and Statistics. To find out just what they actually do there, turn to pp. 3-6.



From the acting Chief Executive

A column by Dr Keith Boardman

'Research in the nation's universities and national laboratories is facing strong new pressures: the huge federal budget deficits...and the widespread perception of a decline in...industrial competitiveness, due in part to inadequate coupling of scientific research to technological innovation.'

I used this quotation to open my recent address to the Victorian Science and Industry Forum. However, it was not taken from an Australian publication. It referred to the United States, but the statement highlights the fact that Australia is not the only country grappling with the problem of getting the most out of research and development. As international trade becomes increasingly competitive and increasingly technology-based, all industrial nations are striving to strengthen the links in their industrial R&D systems.

A recent report by the UK House of Lords' Science and Technology Committee is strongly critical of the handling of science in the UK. One of the report's major recommendations is for a 'third-force' in publicly funded R&D, the other two being the funding given to universities and the research councils to use as they see fit, and the Rothschild 'customer-contractor' system operated through government departments.

The 'third force', the report says, would pay for the vast expansion in strategic research or 'exploitable areas of science', the organisation and funding for which, at present, there is no proper mechanism.

In Australia, that role is fulfilled by CSIRO. As the Lords' report clearly recognises, it is a crucial element in getting the most out of a national R&D effort.

In my address to the Victorian forum, I emphasised that CSIRO should not do the research which should be done in the private sector unless this is done in close collaboration with industry.

I said that CSIRO's research should be broadly applicable and with emphasis on the longer term, but with a commitment to transfer the results to industry for the development of new or improved processes and products. In other words, CSIRO research should principally be of a type not usually carried out by the private sector, but which is vital to the future competitiveness of Australian industry.

I outlined the important initiatives that CSIRO has taken over the past few years to improve the transfer of research results to industry, including the establishment of Sirotech. I illustrated the success of Sirotech by naming the four joint-equity ventures and the thirty collaborative agreements with industry arranged by Sirotech and indicated the likely benefit to Australia from the roughly estimated total sales from five of the ventures: Z-Tech, Dunlena, Sirochem, Scrimber, veterinary vaccines and a new fabric printing process.

Prime criterion

An excellent proportion of the audience was from the private sector, and question time indicated a vital interest in the transfer of CSIRO research to industry and the selection of the individual firms for the commercialisation of the products of our research. I made it clear that our prime criterion in selecting partners was maximum benefit to Australia with the financial return to CSIRO by way of royalties a secondary consideration.

The ability of a firm to market and support a product in overseas countries by means of suitable agreements was of equal importance to its technological capability to develop and manufacture the product.

It was readily apparent from the nature of the questions that there is now a much greater appreciation of the enormous potential value of CSIRO research results, and the need to exploit them for the nation's benefit.

It is absolutely vital, however, for the private sector to increase its R&D if Australian industry is to achieve the level of industrial innovation needed to be competitive on world markets. A much stronger R&D effort in the private sector would certainly facilitate the application of the more broadly based research in CSIRO and provide the nation with a greater return from the research dollar.

N Keith Boardman

Preston laboratories opened for Manufacturing Technology

After six years in cramped rental accommodation in Fitzroy, the Division of Manufacturing Technology's Melbourne staff last year moved into relatively spacious accommodation in the former Ciba-Geigy buildings at Preston.

The Division's new permanent headquarters (there are branches in Adelaide and Sydney) were officially opened on 10 February by Mr Wran, who said he was particularly pleased that one of his first official tasks as Chairman had been to open a facility which would play a vital role in restructuring Australian industry.

Mr Wran congratulated the Chief Dr Bob Brown, and his staff, on the Division's impressive record of achievement durings its six years at Fitzroy.

He said purchase of the land and buildings from Ciba Geigy had proved to be a very cost-effective solution to the Division's needs.

Mr Wran added that in conjunction with the Victorian Government, the site was being developed as a major centre for manufacturing research development and demonstration.

Dr Myles Harding demonstrates an industrial computer package developed by the Division to members of the official party at last month's opening (from right): Mr Neville Wran, Dr Keith Boardman, Sir Gustav Nossal, Mr Barry Jones, Dr Kevin Foley.

'A building for the Victorian CAD/CAM Centre, a joint venture involving the Victorian Government, CSIRO, the Australian Chamber of Manufactures, Prime Computer and the Metal Trades Industries Association, is being built on the site,' he said.

Dr Brown said CSIRO had bought the site for $1.25 million and had spent $1.6 million modifying it. It comprises two buildings with a combined floor space of nearly 5000sq.m, on about one hectare of land. The laboratories now accommodate nearly 60 staff and about 10 industry people.

Acquisition and remodelling of the site was supervised by the Buildings and Property section, with project management by Mr Gerry Smith in collaboration with Mr Larry Stephens from the Division.

Tropical Forests Research Centre

Queensland's tropical rainforest lived up to its name when the Tropical Forests Research Centre in Atherton was opened in a downpour last month.

CSIRO staff and about 60 visitors were forced to take refuge from the rain in a marquee set up outside the new laboratory.

But the Officer-in-Charge of the centre, Dr Graham Harrington, said the bad weather did not dampen the enthusiasm of the staff who 'were very pleased' with the opening.

The new Chairman of the Board, Mr Wran, who opened the $236,000 centre, said Australia must set a world standard in the conservation and restoration of rainforests.

'The world's eyes are upon Australia as the only developed nation with rainforests within its borders,' Mr Wran said. 'Here we are not driven by the imperatives of land, hunger and poverty to exploit the forest for short term survival, ignorant of the implications for the future.'

Following the tour, guests were entertained to a 'rainforest smorgasbord' by Mr Tony Irvine, who provided more than 40 different fruits, nuts, wines, cordials, cereals and toffee to be sampled by the brave.

Mr Irvine's interest in rainforest fruits and nuts has led to the discovery of plants with commercial potential and two severe cases of poisoning.

The centre now has three new laboratories, eight new offices, a fireproof store for documents and data, a controlled environment room for experiments and a library.

During the opening ceremony, the Minister for Science, Mr Jones, unveiled a plaque commemorating the birth on 11 July 1916, at Peeramon, near Atherton, of the Nobel Prize winning Soviet physicist, Aleksandr Prokhorov.

The Soviet Ambassador, Mr Evgenyi Samoteikin, read a message of appreciation from Professor Prokhorov. Scientists who have met Professor Prokhorov say he speaks excellent English with a distinct Australian accent.

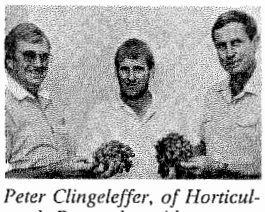
Seedless black grape released

Scientists at the Division of Horticultural Research at Merbein, Victoria, have bred what they believe to be the world's largest, seedless black table grape variety, 'Black Opal Seedless'.

Members of the new Board tasted the grapes at its first full meeting in Canberra last month.

The new variety, Australia's first seedless black table grape, has been grown in commercial quantities for the first time this season, and limited supplies sold well on capital city markets in early February.

A viticulturalist with the Division, Mr Peter Clingeleffer, said it was hoped that Black Opal Seedless would significantly boost Australia's push into the world table grape market, which is now dominated in the northern hemisphere off-season by Chile and South Africa.



Peter Clingeleffer, of Horticultural Research, with grower-exporters of the new Black Opal Seedless grape variety, Neville Kirwin, left, and David Leng, right.

"There are a number of other much smaller black seedless grapes in the world, but these only have commercial appeal once their fruit has been chemically treated to increase berry size," Mr Clingeleffer said.

Black Opal Seedless is a cross between Carolina Blackrose and Ruby Seedless, the cross originally being made by the late Dr Allan Antcliff. Until now, it has been known by its breeding code of MS23-7, and its new name was chosen by the Division after discussions with table grape growers in the Sunraysia area.

Division Feature *Mathematics & Statistics*

DMS: we're in the book, and enquiries are welcome

By the Chief of the Division of Mathematics and Statistics, Dr Terry Speed

You may know of some of our people but do you know what we do and why we do it? DMS is an odd sort of division really: we exist to support research in CSIRO and to assist Australian industry, and without these collaborators and clients we would be out of a job.

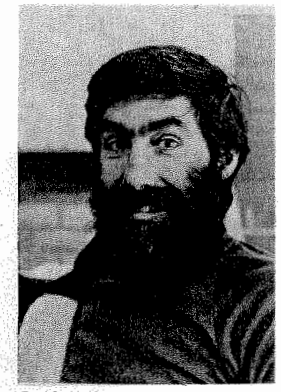
Yet we are also scientists, and have lots we could be getting on with if the collaborators and clients disappeared — for a while at least. The explanation is pretty easy to see: we are 'applied' people — statisticians and mathematicians — and we need you, the rest of CSIRO, and industry, to keep us supplied with stimulating problems to solve, difficult data to help interpret, challenging experiments to design, and so on.

And of course (in our arrogance, our conceit, our pride) we think you need us. A good many of you anyway.

Historically this has been the case. When the first biometrician, F E (Betty) Allan, was appointed to CSIR in 1930, it was because Sir David Rivett felt that the then new subject of biometrics had a lot of offer researchers in the Council. The appointment was highly successful and so it seems he was correct.

More such appointments were made, and in 1954 a Division of Mathematical Statistics (DMS) was created out of the existing biometrics section. Later, in 1973, mathematics other than the statistical sort was added and the division was renamed Mathematics and Statistics.

Obviously we cannot be involved in *all* of the statistical and mathematical activities which go on in CSIRO, much less in the wider sphere of Australian industry. Yet we do not like to exclude any group or individual seeking our assistance or collaboration.



Dr Speed

Each capital city has a DMS group led by a senior regional officer — we are in the book, and enquiries are welcomed. Despite the general desirability of focusing our activities, we do try to help all those who seek assistance. We hope you will appreciate what we laughingly term our 'resource constraints' as much as we do yours.

In between clients and collaboration, and the writing of strategic plans, we try to find time to keep our methodological research up to the level where we can help you as well as anyone in the world could, and retain our ability to solve the problems of the future.

If you don't already know our people in your neighbourhood, meet them. They are a fine lot.

Statistics a major component of industrial success

Mr Bill Armstrong, an industrial statistician with DMS in Melbourne, is going into company boardrooms to convince chief executives of the importance of statistical management methods. Not an easy matter when they have become accustomed to taking short cuts.

'For example,' said Bill, 'a manager needed to know, quickly, what sample size was needed to monitor the quality of a new vacuum packaging process for a lucrative export.'

'The most important thing was to convince him that this would take time because it was vital to learn the statistical characteristics of the whole manufacturing and packing process first.

'The manager reluctantly agreed and four months of patient and careful sampling and testing revealed not only the defect rate (10 per cent), but also unexpected patterns of defectives that led to the complete removal of the source of the defectives,' said Bill.

'It subsequently was found that a competitor had been using the process (badly) for 18 months and had simply come

'The main thing is to learn how to work smarter'

to accept the defects. My client gained enormous competitive advantage for a total cost of less than five man days.

'This is a recurring pattern in business and commerce,' he said. 'The same old mistakes are repeated; they are often obscured by half-hearted attempts to remove or hide their symptoms. Failure to learn the difference between symptom and cause discourages attempts to improve quality and productivity. It is the purpose of the DMS industrial statistics project to break this destructive pattern.'

The 'so-called bottom line' gives no indication of the true costs of rework and lack of control, and obscures the real value of R&D, he said.

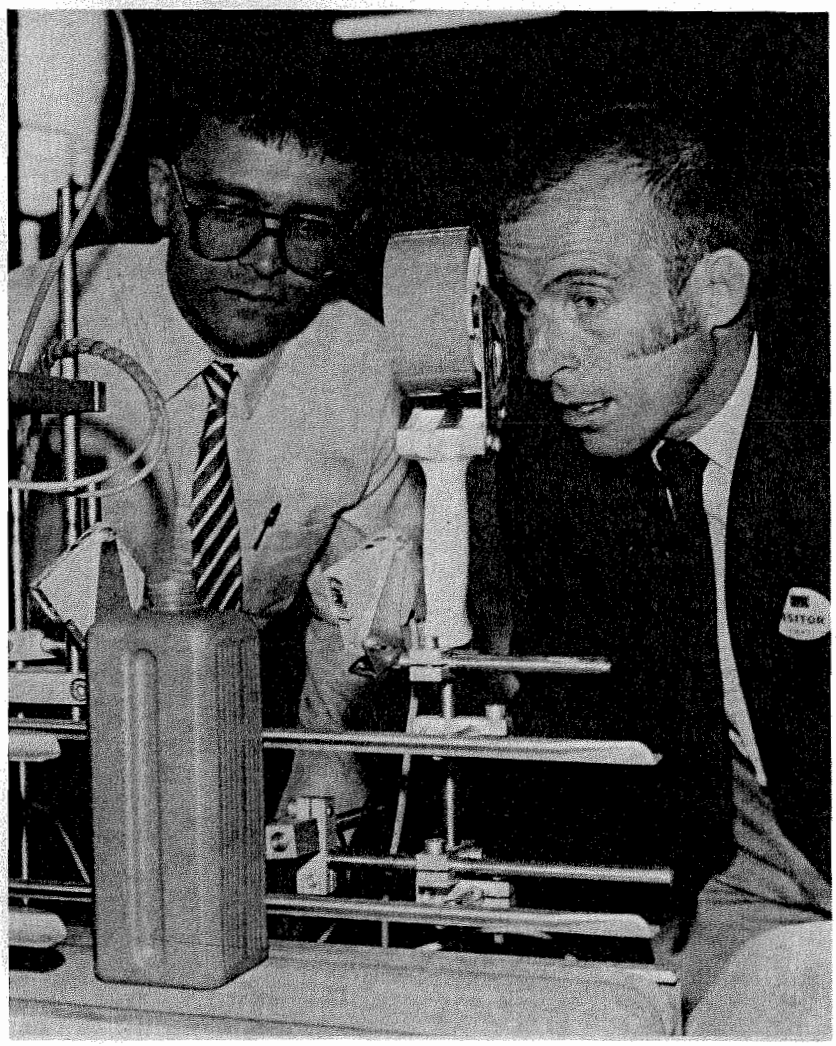
'You don't need sophisticated statistical tools to investigate the costs of the production and administration processes, but you need the best statistical guidance you can get. That's what we have in DMS.'

There is nothing new in the statistical ideas which developed in the pre-war American mass-production industries and the British agricultural industry.

They were introduced widely (in a hurry and badly) during the war and consequently died out afterwards. However, the Japanese adopted and adapted them, using them just as effectively in service areas like banking and administration; it is undoubtedly a major component of their industrial success.

The ideas are now enjoying a resurgence in the West. This is largely due to the efforts of one man, W Edwards Deming who, ironically, was mainly responsible for the Japanese developments after the war.

'The industrial statistics project aims to encourage and help that process in Australia and to ensure that the mistakes of the past are not repeated,' said Bill. 'The main thing is to learn to work smarter.'



Bill Armstrong, right, learns the facts behind the figures.

This feature is designed to represent a cross-section of activities at Maths and Stats and is not intended as a directory to the Division's research.

What is a biologist doing at DMS?

Dr Ray Correll is a biometrician based in Adelaide where he has responsibility for the statistical consulting with the Division of Soils, the Forest Research Station at Mt Gambier and the Division of Horticultural Research both locally and at Merbein.

It comes as a surprise to some of Ray's clients that his initial training was in plant ecology, and he obtained qualifications in mathematics and statistics after working as a biologist for 10 years. This dual role as a biologist and a statistician enables Ray to collaborate in biological projects rather than act only as a statistical consultant.

One of Ray's roles as a biometrician is to assist with experimental designs. Usually a design is a compromise between statistical nicety and practicality. Generally he can improve on a design either in terms of precision, or by increasing the scope of the experiment. If a trial is well designed, it will be easier to analyse and will give more useful information for the same effort.

Of particular interest are some forestry trials. Because of their long duration there are generally changes in personnel between the planning and analysis stages. In such cases it is essential the design and its method of analysis be described in a consulting report written for the client.

Another role is data analysis. A biometrician's role is to summarise the data, deciding which effects are real and which may be attributed to random fluctuations. Having obtained a summary of the data it must be interpreted in a way meaningful to the client. This is where his biological background is invaluable. For example, when analysing data from plants in their exponential growth phase, a log transformation converts the data to growth rates.

A bonus of this collaboration is that Ray recognises interesting mathematical problems in his consulting and refers these to his colleagues in DMS.

One example of this is the effect of competition in forestry varietal trials. This led to a joint project with Dr Graham Constantine, who solved the theoretical problems.

Ray Correll.

Being a statistical consultant means being involved with many different projects. He often gets telephone messages like 'Do you remember that PD1 trial you analysed last year, we have done some more data — could you help us with them?' At this stage Ray is perhaps talking about a Casuarina trial with another client and has to recall what PD1 was — 'what did I do last time?'

Ray has no regrets about changing from biology to statistics. He can do more biology this way. The interesting parts of biology to him are designing experiments and then examining the data to see what conclusions can be drawn from the trial. It is in these two areas that a biometrician is involved.

Statistics and entomology

Animals vary and plants vary; insects clump, feed, reproduce and die in ways that produce even more variation.

Interaction between insects and their hosts are of particular interest to entomologists, who, for example, use insects to control pests and weeds.

The complexity of modelling biological events and the random variation is one reason why there has been a long standing relationship between the divisions of Entomology and Mathematics and Statistics.

If a mild degree of insect feeding may stimulate plant growth, or if insects are ineffective in a lush year, the model should allow for this so as to assess whether the insect would be an effective control in the long term.

The ecology of dung pads, with the many competing insect species, requires even more complex modelling both of the insect interactions with each other and the effect of evolving dung quality.

Both divisions have staff throughout Australia and the DMS entomology project is led by Mr Richard Morton in Canberra. His collaboration with Entomology began in 1979 with the assessment of light trap catches of heliothis moth in cotton crops.

Studies of sheep blowfly data led Richard to interesting theoretical research on generalised linear models.

In Perth, Mr Mark Palmer and Mr Richard Litchfield have modelled the inter-relations of beetles and bushfly in dung pads.

Mr John Kerr and Ms Anne Bourne in Brisbane have been collaborating with Entomology since the establishment of the Long Pocket Laboratories, working with cattle ticks and buffalo fly and the control of terrestrial and aquatic weeds such as salvinia.

Above (from left): John Matthiessen (Entomology), Mark Palmer and Richard Litchfield (Maths and Stats) and James Ridsdill-Smith (Entomology) look at dung beetles.

Being on site yet close to other colleagues in the Division has stimulated a productive interchange of ideas between entomologist and statistician and an appreciation of the problems in the field.

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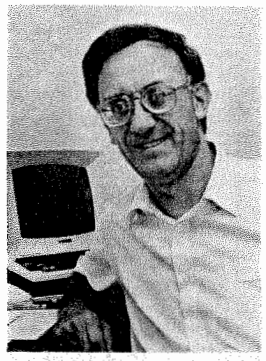


Right, Richard Morton, entomology project leader. Below, Ann Bourke and John Kerr, Brisbane.

Former visitor comes back to stay

The very active and successful divisional visitors' program has brought Dr Peter Diggle, formerly with the University of Newcastle-upon-Tyne, back to Canberra.

'I first visited DMS for five weeks in 1980, liked what I saw and persuaded my family to join me for a second, one-year stint in 1982-83. This in turn led to my being offered a permanent job with DMS from January 1985.

'A long time ago, a professor of statistics said to me "the great thing about statistics is that it lets you poke your nose into everybody else's business'. Working for DMS is a bit like that, at its best — a marvellous blend of consulting, collaborative and disciplinary research.

'I firmly believe that the best statistical research arises out of applications. For example, I'm now working on new methods of analysing data on hormonal fluctuations in mammals. This work started as a consulting problem at the Division of Wildlife and Rangelands Research where I spend one day each week.

'I gave my clients, Hugh Tyndale-Biscoe and Lynn Hinds, a quick answer to their specific questions, using simple but probably sub-optimal statistical methods.'

Peter Diggle, left, and Scott Zeger.

Later, DMS held a workshop on Time Series in Biology to coincide with a visit from Scott Zeger, a biostatistician from Johns Hopkins University. It turned out that data similar to Hugh and Lynn's crop up in other divisions, eg. Animal Production at Prospect, and it's far from clear that existing statistical methods can give an adequate analysis.

'So now we have a DMS research task to develop statistical models of hormone fluctuations. This will involve a substantial proportion of my own research time during 1987, together with contributions from DMS colleagues John Donnelly and Neil Crellin, and continuing input from Scott Zeger.

'I think this experience illustrates several important points about working in DMS. One is that consulting and research go hand in hand, and often benefit from each other.

'Another is that although our regional units are relatively small, we can and do get together with our interstate colleagues to share our collective experti.e — which, nationwide, is very considerable.

'Finally our visitors' program often provides a catalyst for new projects, helps counteract Australia's geographical isolation, and best of all, it brought me here.'

Maths-in-Industry groups a notable success

The applied and computational mathematicians in the Division work closely with industry.

They organise the very successful annual Mathematics-in-Industry Study Groups, do industrial consulting through SIROMATH (a private firm), and collaborate directly with industry.

The Mathematics-in-Industry study group is a week-long brain-storming session in which Australian industry presents problems to mathematicians from organisations throughout the country.

So far, three study groups have been held and 25 problems from nearly 20 companies have been presented.

There have been notable successes. These include: a model of blasting operations for mining operations, a communications scheme for implantable heart pacemakers, and an analysis of the stresses in slightly oval-shaped gas cylinders.

The study groups have provided excellent contacts, new research directions for mathematicians and economic benefits for industrial participants. The next study group will be held in Sydney early in 1988.

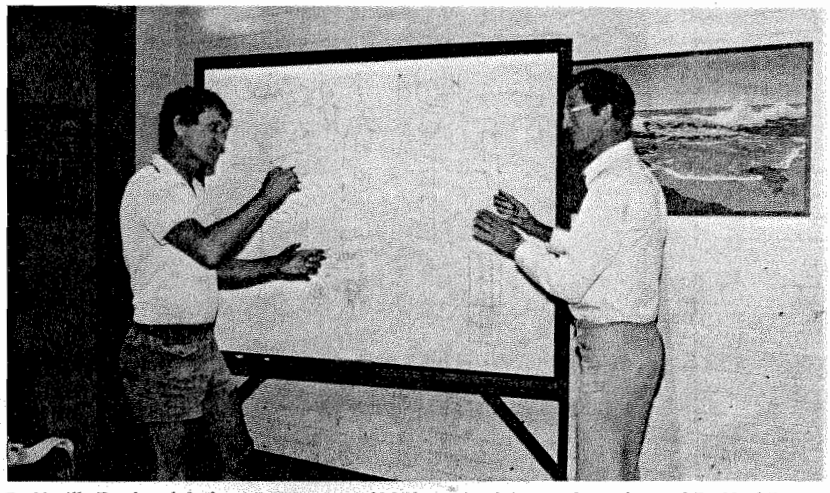
DMS staff do confidential industrial consulting through SIROMATH. One highly successful piece of applied mathematical consulting was the analysis of prototype machinery for refining of gold-bearing ore.

Operating procedures

Before the mathematical work, the equipment did not work at all. Subsequently, the analysis suggested operating procedures which made it work ten times better than expected

Other major consulting jobs recently performed include the analysis of mirror design for overhead projectors and the design of a heat-rejecting diaphragm for a solar telescope.

DMS is collaborating directly with industry on the analysis of the stresses induced in winding materials such as steel or aluminium onto coils. This particular work may be patented and should have wide application in Australian industry.



Dr Neville Fowkes, left, from Department of Mathematics, Western Australia, and Dr Noel Barton, DMS, Sydney, discuss one of the industrial problems presented at the MISG–86 held in Melbourne.

Animal variations

Wherever you find animal variation, you usually find a statistician trying to explain the sources of variation.

Such a combination of animals, variation and statisticians may be found at the Parkville laboratory of the Division of Animal Health.

Statisticians have been consulting at the Parkville laboratory since the early 1950s when the Division of Mathematics and Statistics was still the section of mathematical statistics. Over the years the consulting commitment has grown and today a cohesive group attends to the statistical needs at Parkville.

The 'Parkville group' consists of Drs Dorothy Anderson, Richard Jarrett, Albert Trajstman and Ms Vivienne Lewis, and apart from consulting they meet at regular intervals to discuss new methodology unique to problems in the animal sciences. Working in collaboration with scientists at the laboratory they have made valuable contributions to numerous projects.

Dr Jarrett and Ms Lewis have been closely involved with the work of the parasitology section at the Parkville laboratory. In fact, interest in the statistical problems encountered in parasitology led to a workshop of statistics in parasitology held jointly between the divisions of Mathematics and Statistics and Animal Health in Sydney last year.

Design and analysis of numerous vaccine trials also have been of interest. For example, Dr Anderson and Ms Lewis have analysed data ranging from vaccines for enzootic pneumonia in pigs to vaccines for foot abcess in cattle.

Dr Trajstman has recently been working on data that assess the growth of mycobacteria colonies on different media and subjected to different decontaminants. This is an interesting problem as the development can be assessed in a number of ways. Three possible measures of colony development are the time taken for the first colony to appear, the number of colonies that develop and whether or not there has been contamination.

Other projects that the statisticians have been involved in include methods for quantifying sheep liver damage due to phomopsin toxin, investigations of the effects of dietary iron in Johne's disease and various aspects of handling data obtained from enzyme linked immuno-sorbent assays.

Current interests of the group are the use of additional information, such as time to a response and ways of handling data when only some of the animals respond to a treatment.

How to enhance your image

An increasing amount of scientific data is now being collected in the form of images: microscopic images, satellite photos and other remote sensing images, ultrasound scans, radio telescope maps and so on.

Equally, there are a number of scientific problems associated with these images.

Can we quantify simply the differences between two images? How do we measure spatial association between minerals in a microscope image? Can we develop an automatic procedure to detect unusual features in an image, such as wool impurities or rare minerals? How can spurious effects be removed without seriously affecting the real image?

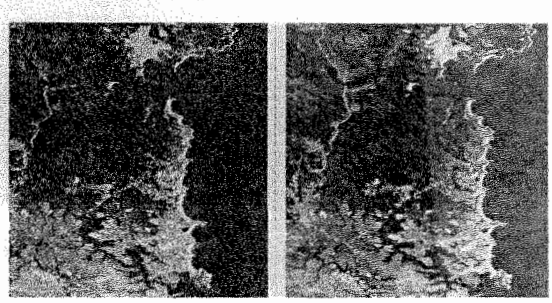
Images are usually recorded and stored in digital form, as a large array of numbers. Hence, mathematical and statistical techniques are required to answer questions such as those posed above.

CSIRO scientists increasingly have been turning to DMS for assistance. Consequently, in 1985, the Division established an image analysis research project.

Very active

Although small, the group is very active and already is collaborating on a variety of image analysis problems with the divisions of Manufacturing Technology, Mineral Physics and Mineralogy, Soils and Textile Physics.

One such collaboration (with the Division of Mineral Physics and Mineralogy, and Stanford University) is the development of a new procedure for separating noise from signal in multispectral remotely sensed imagery.

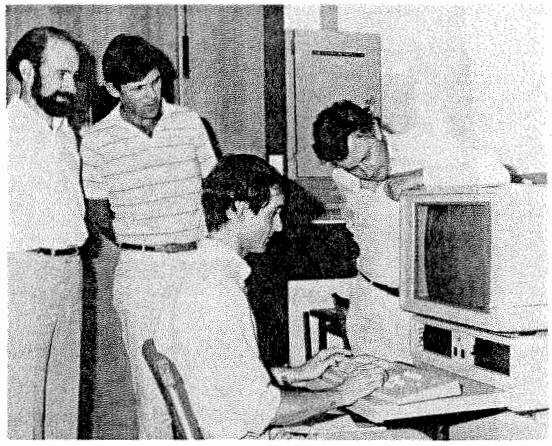


The northern half of Sydney. Left: a noisy Landsat MSS band 4 image, and right: the same image after an estimate of the noise has been removed using the new procedure.

Such imagery is sometimes subject to various forms of signal degradation ('noise') due mainly to atmospheric distortion of the signal received by the scanner or to instabilities in the scanner itself.

The noise can make it difficult to recognise and interpret small-scale features in images.

The new procedure usually produces noticeably clearer images than those obtained using traditional methods. This makes the images more readily interpretable by users of remotely sensed imagery.



Left to right, Maurice Craig (Division of Mineral Physics and Mineralogy), Mark Berman, Adrian Baddeley (both DMS) and Andy Green (DMPM) discuss an image displayed on a colour graphics workstation at the National Measurement Laboratory, Sydney.

Staff posted far and wide

The Division's staff tend to be found in the more temperate parts of the country, but scientists working elsewhere need statistical advice just as much as their colleagues.

To meet this need the Division has had two statisticians based in CSIRO laboratories in the north: Mr Kev Cellier in Darwin and Dr Dennis Sinclair in Townsville.

They have been involved in a variety of projects, including studies of the distribution and abundance of various animal species at Kapalga, NT, and studies of the spatial patterns of termite mounds.

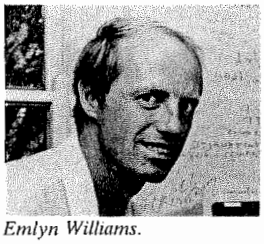
Full-time location in the same laboratory as scientific colleagues has contributed to excellent working relationships, but has meant that the statistician concerned has to be very versatile. He may also suffer from lack of contact with fellow statisticians to exchange ideas, so the Division ensures that no-one spends too long in isolation.

An alternative approach is to assign statisticians to individual projects. Usually the statistician is located in the same city as the headquarters of the division most concerned.

Jeff Wood.

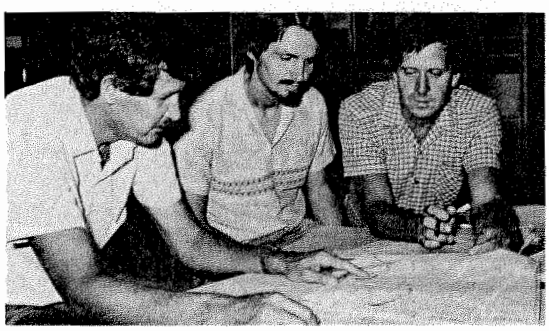
For example, in Canberra Dr Jeff Wood has worked on a fauna survey in the Kakadu National Park conducted by the Division of Wildlife and Rangelands Research, and Dr Emlyn Williams is working with the Division of Forest Research and the Queensland Department of Forests on a project funded by Shell to evaluate Australian hardwoods for cultivation in the tropics.

The Division's staff are also in demand as visiting experts in Asia and the Pacific region. Recently Mr Paul Haydock visited Fiji as part of a project to train Fijian scientific staff, and Dr Sinclair visited Thailand at the invitation of the International Board for Soil Research and Management.



Emlyn Williams.

Monitoring a big country



Australia is a big country and monitoring sections of it from the ground is extremely demanding. So there has been enthusiastic acceptance of remote sensing methods by many organisations, including a number of CSIRO divisions, government departments, industry and agricultural groups.

Norm Campbell and Harri Kiiveri from the DMS remote sensing project with Peter Hick, Division of Groundwater Research.

To date, remote sensing has largely meant LANDSAT and, more recently, NOAA. The LANDSAT satellite scans the ground to receive the reflectance from pixels, approximately 80sq.m areas. This is collated in four spectral bands, giving information on different aspects of the landscape.

Each satellite pass produces a lot of numbers. Numbers are our business, so DMS established a remote sensing project to undertake collaborative studies using such data and to carry out research into the many new statistical questions raised by this usage.

Successful collaborative applications include discrimination between crops and pastures in the West Australian wheatbelt, the monitoring and list of cover type and condition in semi arid rangelands and the mapping of areas of salinity.

These require knowledge of 'ground truth', that is what is actually in some pixels scanned, so the final product is a mixture of original statistics and traditional slogging ground sampling. DMS has, perhaps, the less exhausting part of this collaboration.

Much of the project's research effort has focused on incorporating information from neighbouring pixels into techniques for allocating pixels to different classes (of vegetation, for example). Neighbours tend to be similar, they are also statistically correlated. Methods which take account of these factors can give significant improvements in allocation performance and several are now available.

Mathematics and statistics have a major role in the spatial interpretation of data from space. They help to keep an eye on the condition of Australia.

Nearest neighbour analysis a new form of communal psychotherapy?

No, it's the newest branch of statistical methodology for analysing the results from large agricultural field trials.

It's a mathematical way of preventing any continuously varying trend in soil fertility, etc, from biasing the calculations of comparisons between varieties and usually results in substantially more accurate estimates of these as well.

The technique is of particular importance to plant breeders who plant large numbers of trials each year in their quest for improved varieties of, for example, wheat and barley.

Dr Graham Wilkinson from the Adelaide region of DMS outlines the basic idea and some of the background:

'The classical methodology for designing and analysing scientific experiments was very largely developed in the 1920s and 30s at the Rothamsted Experimental Station in the UK by R A Fisher and F Yates. Though first widely used in agricultural experimentation, the ideas soon spread to other fields of science such as biology, medicine and industrial technology.

Graham Wilkinson, seated, discusses some of the underlying mathematics of nearest neighbour analysis with Graham Constantine, the senior regional officer, Adelaide.

The design and analysis of experiments constitutes much of the workload of DMS, and the Division has a long-established international reputation for its contributions to developments in this field.

Generalised lattice designs, for instance, which were developed by Dr Emlyn Williams from the Canberra region, in conjunction with Dr H D Patterson in the UK, are being used routinely in the British national varietal testing programs.

An unsatisfactory feature of the classical methodology for analysing large field trials has been that the underlying, continuously varying trends in soil fertility, etc, are not eliminated from treatment comparisons in a correspondingly continuous manner.

A way of doing this was suggested in 1937 by a Greek plant breeder, J S Papadakis, but astonishingly his important idea was largely overlooked by statisticians for more than 30 years. My research revealed a technical flaw in Papadakis's proposed method and this led me to develop a new but related method called NN analysis, in collaboration with colleagues at the Waite Institute.

The basic idea in its simplest form is to adjust each plot yield by subtracting the mean yield of the two closest neighbouring plots. This cancels out any locally linear component of fertility trend.

A fairly complex mathematical analysis is then applied to untangle the treatment effects mixed up by the neighbour adjustments and to assess the accuracy of the treatment estimates.'

Dr Wilkinson is widely recognised for his research on analysing experimental data. His 1961 paper on statistical estimations in enzyme kinetics is one of only two Australian papers in a list (Current Contents, 1979) of the 100 most cited papers in the 1960s in biochemistry and molecular biology.

He was also a principal co-developer (with J A Nelder) of the statistical computing system GENSTAT which is now used extensively by CSIRO divisions, as well as universities and many other scientific institutes.

You can count on the statisticians ...

Each year when someone at Clayton says, 'Hey, I've got a great idea, let's put on a show!', you can be sure the reply is always, 'Well you can count on the statisticians for a good performance'.

The Division of Chemical and Wood Technology presents a Christmas revue at the end of each year and the Melbourne members of the Division of Maths & Stats have always been willing and able contributors.

A skit with a mathematical flavour, written and performed by the multi-talented Melbourne Maths & Stats group is a regular feature.

Not only can they be funny, they can sing and dance also. The 1986 revue included musical numbers involving Richard Jarrett, Viv Lewis and Ian Saunders. A down-market version of the 'Teddy Bears' Picnic' proved once and for all

Albert Trajstman, John van der Touw, Ian Saunders, Dorothy Andersen and Richard Jarrett.

that statisticians can be warm and cuddly people.

The other frustrated thespians in the Melbourne group include Dorothy Anderson, Susie Duerr, Nick Stokes, John van der Touw and Albert Trajstman.

Although the flavour of the skits has always been mathematical, the topics have certainly varied. In 1985 a convoluted sketch endeavoured to prove that the works of William Shakespeare were written by an early member of the Division of Maths & Stats.

Such works as The Taming of the Skew, The Merchant of Variance and the Comedy of Standards Errors were cited as proof of this little known fact.

Albert Trajstman played Shakespeare (and lost), John van der Touw played Marc Anthony and Nick Stokes apparently was supposed to be Romeo.

In 1984 sides were split and more than ham was served in a skit that had six statisticians dining out. That performance has provided quotable lines that are still heard around the Clayton site to this day.

The 1986 skit, written by John van der Touw, exposed the decision-making process used in selecting the new senior regional officer for the Victoria/Tasmania region.

Health matters

Warren Smith has taken up the position of occupational hygiene advisor within the Occupational Health and Safety Unit. Warren will coordinate workplace health and safety inspections.

He comes to us with a wide background in the mining industry, including several years as head of safety and hygiene at Mt Isa Mines.

Radiation Safety

The CSIRO Health and Safety Committee has set up a sub committee to examine radiation safety standards within CSIRO and to develop a code of practice on the use of radioactive materials (sealed and unsealed sources) and irradiating machines.

The sub committee includes a representative from each institute and Dr Ron Rosen from the University of NSW. The group will be visiting selected sites to inspect facilities and discuss procedures with staff.

Health Study

Dr John Graham, our occupational health adviser is currently surveying some 550 staff who work with or near small laboratory animals.

The aim of the study is to determine the incidence of animal-related allergies and to relate this to a study of work methods in an endeavour to minimise health effects.

Ergonomics study started

David Caple, a consultant ergonomist, has started a study of microscope workstations at several divisions. The aim is to determine biomechanical and postural difficulties resulting from poor furniture or equipment and poor work practices.

A code of practice on the safe use of microscopes and results should be available by May.

The divisions of Protein Chemistry, Materials Science and Technology, Manufacturing Technology, Entomology and AAHL are assisting.

Health and safety videos

An updated list of OHS videos and films is now available on loan from the OHS Unit.

Many titles have been previewed, so only the most relevant to CSIRO work situations have been purchased.

Lists have been set to all safety officers and topics covered include first aid, chemical safety, hearing, eye protection, lifting, handling small and large animals etc. Arrange a film festival at your site now!

Gary Knobel

Neville Wran

Cont. from p.1

'It may well mean that some programs will be abandoned, while others will be introduced. Specific decisions on this will be in the hands of the Chief Executive.'

Although he doesn't like the term 'wimps' being applied to scientists (a label Science Minister Barry Jones once used), he does believe one of his most important roles will be lobbying the Government for sufficient research funds, because scientists aren't very effective at this themselves.

'I find that scientists are so preoccupied with what they're doing that they haven't got time to push their own barrows.

'I can fight for them at government level.'

He will also be addressing himself to several contentious policy issues in the immediate future.

'I'm well aware of the brain drain and of the debate about the remuneration for ideas, the ownership of intellectual property and the proceeds from inventions.

'By the time the Board addresses these questions, I want to have talked to a hell of a lot of people and found out what the view of the scientists is.

'I don't want to impose any new structures just for the sake of change. We want to be sure that if there is to be a change, there are good reasons for it.

'It's the same with the relationship between the Organisation and the Public Service Board.

'There are some obvious pluses in terminating that relationship, such as increased flexibility.

'But the Board would want to talk to the unions and I certainly want to get the views of staff.

'Most people who work for a living are a little afraid of change, especially when it's perceived to remove a protective umbrella,' he said.

'Obviously you can't talk about severing the nexus with the PSB unless you have a satisfactory framework with which to replace it.

'I can understand that before the matter can be acceptable to staff, they will want to know what the safeguards are.'

The subject is likely to be discussed at the March Board meeting.

Mr Wran echoes Barry Jones' assertion (*CoResearch* 299, February 1987) that standards of excellence in CSIRO must be maintained. He said he supported the conduct of basic science in the Organisation, 'provided it has some relationship to national priorities'.

'Determining this is a matter of fine judgement. Once the priorities for the Organisation are established, it's a matter for scientists to decide how those priorities will be achieved.

'We are not turning CSIRO into a dial-a-boffin outfit for industry.

'It's important we establish our strategic plans so everyone knows where we are going as quickly as possible.'

Mr Wran said the advancement of Australia is also dependent on co-operation and collaboration with Australian industry, and he said the Federal Government's 150 per cent tax incentive is starting to bolster research spending by companies.

Quoting from a recent speech by Chief Executive Dr Keith Boardman, he said 'so far it would seem that the amount being invested by industry in research has doubled since the tax incentive was introduced', and this total investment was now worth a billion dollars.

'I'm hopeful that this trend will be maintained. I believe science, in its contribution to Australia's living standards, has taken on a much higher profile.'

He gives credit for this partly to Mr Jones and the Industry, Technology and Commerce Minister Senator John Button.

And he said if it hadn't been for Mr Jones' powers of persuasion, he would not have taken on the job.

'I didn't want a Government job,' he said. 'All those comments about 'jobs for the boys' really annoyed me.'

He said he definitely did not accept for the sake of the money.

'By the time the tax is taken out of my CSIRO salary, I get the princely sum of $10 000 a year.'

So why did he accept? 'I went into it because I thought it was a way in which I could make some contribution to the community,' he said.

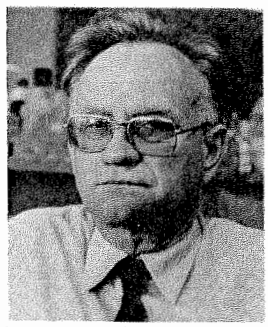
'I regard being the Chairman of CSIRO as a great challenge.

'I will only be able to meet the challenge if I work hard to understand the aims and aspirations of the people within the Organisation, and the way in which those aims and aspirations can be related to national priorities.

'Apart from anything else, it's a very interesting experience.'

OBITUARY
Dr Bohdan Bubela, geobiologist

Bohdan Bubela died in the Royal Canberra Hospital on Wednesday, 28 January after a mercifully brief battle with brain cancer. He is survived by his wife Bozena and daughter Tania.



Dr Dan Bubela

Dan was born in Czechoslovakia in 1923 and emigrated to Australia soon after World War II. After working as a labourer and then in a car assembly plant because his Czech Diploma of Chemical Engineering was not recognised here, in 1950 he obtained a position as a chemist with Fauldings Pharmaceuticals in Adelaide.

With Fauldings he rose to the position of Senior Research Chemist with, at various times, responsibility for production quality, formulation of new products and theoretical aspects of pharmaceutical formulation.

He resigned from Fauldings in 1959 to undertake study for a degree at the University of Adelaide. He graduated with a Bachelor of Science (Honours) in 1961 and went on to successfully write a thesis for a Doctorate of Philosophy.

The topic was aspects of the biochemistry of thermophilic bacteria. His higher degree was awarded in 1964. After a period lecturing at the University of Adelaide he spent two years in Boston, USA, working in the Worcester Foundation for Experimental Biology.

In 1966 he joined the Baas Becking Geobiological Laboratory, a joint Bureau of Mineral Resources-CSIRO research facility in Canberra.

At the time of his death he was still working there. His initial research dealt with metal toxicity in bacteria and algae, and bacterial responses to high temperature, high pressure and hydrogen sulphide. He then developed experimental systems for fairly large-scale simulations of sedimentary environments. In these systems the formation of various low temperature minerals was studied.

Dr Bubela's research of the last six years dealt with using bacteria to produce surfactants, viscosifiers and gas in natural oil reservoirs to increase the recovery of oil.

This innovative research was at first greeted with much scepticism, but nonetheless was well supported financially. He was able to isolate some suitable bacteria and demonstrate in the laboratory that the technique is feasible.

The research will continue and field trials are planned for later this year. If the technique can be used successfully it will offer a method much cheaper than those used currently to enhance the recovery of oil.

Dan Bubela was an innovative, enthusiastic, determined scientist. His main interest was in the commercial application of his research and trials are now imminent. He travelled widely to conferences, was the author or co-author of more than 70 publications, and received a number of awards.

He was a Senior Principal Research Scientist in CSIRO and a Fellow of both the Australian Institute of Energy and the Australian Academy of Technological Sciences.

Malcolm Walter
Baas Becking Laboratory

Bicentennial competition

The Australian Bicentennial Authority is looking for nominations for its '200 Greatest Stories Never Told' competition.

The competition aims to recognise Australia's unsung heroines and heroes. People who made an outstanding contribution to Australia but never received the credit they deserved.

The deadline for entries has been extended until late May. Nomination forms and further details can be obtained by writing to '200 Greatest Stories Never Told', GPO Box 1628, Sydney, NSW, 2001, or telephone (02) 236 1988.

Mariculture

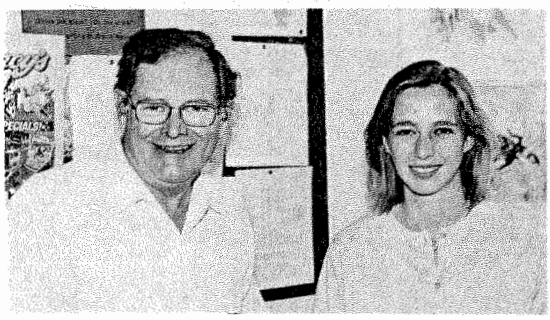
The Marine Laboratories and the University of Tasmania recently hosted the first workshop on the growing of microalgae for Australia's mariculture industry.

The workshop, which was organised by Dr Shirley Jeffrey, of the Division of Fisheries Research, and Dr Christian Garland, of the university's Department of Agricultural Science, attracted 22 delegates from around Australia.

The week-long workshop provided 'hands-on' training and emphasised technical skill and the fastidious care taken in the industry, as well as looking at all aspects of producing micro-algae.

Three generation family link

The association of the Stephens family with CSIRO bridged three generations late last year when Linda Stephens of Sydney joined the Division of Mathematics and Statistics for a vacation job.



John Stephens and Linda Stephens

Linda is the daughter of John Stephens of the Division of Fossil Fuels at North Ryde, and grandaughter of Charles Stephens, who for many years headed a section of the Division of Soils in Adelaide.

Her grandfather Charles joined CSIR, as it was then known, in 1929, on a research studentship to study the soils of apple orchards in Tasmania. He was then appointed permanently to study Tasmanian soils more widely, and in 1938 was transferred to Adelaide.

After World War II he studied soils in all parts of Australia and many parts of the world, including Borneo, India, South Africa, central Asia, north America and Europe. It was not all hard work. A dinner jacket was essential to cross the Atlantic in the Queen Elizabeth, while an invitation to afternoon tea at the chateau was more than a pleasant break from soil sampling at one of the vineyards in the Loire Valley; the spoons were made of solid gold!

Linda's father John joined the Coal Research Section in 1959 after holding a CSIRO studentship. His career has been as varied technically as his father's was geographically. He has an abiding interest in the structure and classification of coals.

A highlight has been the establishment, with Jack Middlehurst of the Division of Food Research in 1977, of the high-power nuclear magnetic resonance laboratory. This joint facility has proved highly productive. John is currently a vice-president of the Officers Association.

Linda, in her brief sojourn with CSIRO, worked with Murray Cameron on assessment of a method of determining confidence limits in auto-regressive spectral density estimates. Data from a wide range of projects in many divisions are evaluated by this technique. She has now returned to Sydney University to complete an honours year in the Department of Mathematical Statistics.

Charles Stephens

These events naturally pose two questions. Firstly, how many other similar family associations are there with CSIRO? Secondly, would staff recommend CSIRO as an employer, or even a career in science and technology, to their children today? Linda has chosen to study in the Arts rather than the Science Faculty at Sydney University with Japanese as her principal supporting subject. Her father approves of this for the diversity of career opportunities it should provide.

Food Research tributes

More than 100 guests attended a function at the Division of Food Research North Ryde Laboratory last month to mark the end of Dr John Christian's eight-year term as Chief.

Unveiling a portrait of Dr Christian, the acting Director of the Institute of Animal and Food Sciences, Dr Alan Donald, paid tribute to his accomplishments and formally announced that Dr Christian would remain with the Division, at least until his retirement in about three year, as a researcher and consultant.

In a typically relaxed and humorous response, Dr Christian declared 'the less I look at this portrait, the more I like it' and went on from there to outline the high (and sometimes low) points of his very eventful career with the Division.

Dr Christian's wife, Jacky, as well as foundation Chief Dr Jim Vickery, many retired former colleagues and new Chief Des Walker were among the guests.

The function also provided an opportunity for the staff to farewell Miss Sandy Henderson, who will retire in April after 26 years service to the Divisions of Food Preservation and Food Research.

Miss Henderson has the unique distinction of having worked as Personal Secretary to the four Chiefs who have led the Division during its 60 years. Three of them, Drs Vickery, Christian and Walker, were present.

Dr Christian, who spoke warmly of the contribution which Miss Henderson made to the Division, presented a portable electronic typewriter to her on behalf of the staff.

Retirements

Three long-serving members of the Division of Atmospheric Research have retired over the past six months. They are:

o Senior technical officer Mr Bob Simm, who spent 31 years with the Division, most recently in charge of site services.

oPrincipal research scientist Dr Chris Coulman, who has spent 21 years with CSIRO, was formerly in the Division of Cloud Physics and officer-in-charge of the Cloud Physics Laboratory in Sydney until its closure in 1985. In the year before his retirement, he was visiting scientist at the University of Clemont Ferrand in France.

oPrincipal research scientist Mr Eric Webb, who spent 36 years with the Division, and a member of the team which joined in the late '40s and early '50s to form the Meteorological Physics Research Station. He will continue his association with the Division with an honorary research fellowship which took effect in December for one year.

A Matter of Opinion

This month's point of view column comes from the new Public Affairs Unit officer, Mr Lindsay Bevege.

The demand for public accountability has been felt by everyone at CSIRO. The increased competition between divisions for funds, the numerous reviews and reorganisations, the drive to 'commercialise' the Organisation and the 'meetings, bloody meetings' which drag scientists away from their research in the name of 'communication', has not made life easy.

The pressure is not going to let up; it's going to increase. Advances in information processing together with an increasing sophistication in the tactics of political pressure groups, who want a say in how the government dollar is spent, is opening the operations of all government organisations to intense scrutiny. Even the remarkable art and skills of Sir Humphrey Appleby would be insufficient to stop this drive which its proponents hail as the coming of age of democratic government.

What does this mean for CSIRO and what will be demanded of it? CSIRO has an advantage over normal government departments in having some commercial exposure. The commercial successes of CSIRO, past and future, will stand us in good stead in proving the Organisation's relevance to industry and society.

But CSIRO's success in fulfilling its charter cannot be measured purely in terms of dollars earnt from specific inventions.

The benefits of strategic research, particularly research on community issues, are not always in the form of a commercial product. Attempts are being made to develop a systematic approach to valuing these benefits, but no rigorous method is yet available. How then, can CSIRO give account of its expenditure in these areas, where the convenient yardstick of money returns is absent?

Making sure that key external groups are at least aware of these intangible benefits is obviously an important part of the process. But this is not enough. We must also prove to would-be scrutineers that these benefits are being delivered efficiently. Managerial efficiency, or alleged lack of it, is at the heart of major corporate takeovers. In a slightly less obvious way, given the absence of the hard profit-loss statement, it is also at the heart of 'bureaucratic takeovers'. Those takeovers could be in the form of budgetary cutbacks or organisational dismemberment and in CSIRO's case usually surface in Rothschild-type proposals. Clearly then, any government unit which cannot prove its efficiency, irrespective of whether it is or is not efficient, is vulnerable.

CSIRO, therefore must not only have managerial efficiency, but this efficiency must be demonstrable. This means CSIRO and all its components must be vigilant in keeping abreast of and putting into pactice the latest in management techniques, technology and systems to prevent any outsider from claiming that 'I could do it better'.

Unfortunately, as we all know from bitter experience, maintaining and upgrading formal management systems takes time. But the demand for public accountability is not going to go away and failure by any organisation to respond to that demand will cause the bureaucratic wolves to smell blood. And ultimately as has been proven in all fields of endeavour a formal systematic approach to management is about saving time and money for the Organisation.

Letter to the Editor

Dear Editor,

Congratulations on getting Bob Beale, science reporter at the *Sydney Morning Herald*, to do an 'opinion' piece for *CoResearch*.

Hope you'll seek out others who have some constructive criticism to make of Australian scientists and our institutional arrangements.

Chris Watson
Division of Soils

***CoResearch* is produced by the Public Communication Unit for CSIRO staff. Readers are invited to contribute or offer suggestions for articles. The deadline is the last Monday before the issue month. Editor: Liz Tynan, PO Box 225 Dickson ACT 2602. Ph: 48 4479.**

CoResearch
CSIRO's staff newspaper
No. 301 April '87

Conference spurs on new communication spirit

There is a renewed spirit among CSIRO's professional communicators. This was the impression left after the first communication conference the Organisation has held for six years.

About 90 communicators from divisions, units and the Bureau of Information and Public Communication took over the impressive Airport International Motor Inn at Queanbeyan, just outside Canberra, for three days.

The mood was optimistic, as communicators discussed the changing communication environment and their plans for dealing with it. In many cases such face-to-face interaction is rare because of the distances separating communicators.

The conference covered a wide range of communication matters, from the corporate identity, to dealing with the media, to evaluation, training and internal communication.

The Chief Executive, Dr Keith Boardman, addressed the internal communication session.

He said internal communication was a fundamental responsibility of management at all levels. '[It] really comes down to the commitment and attitudes of managers — not just directors and chiefs but group leaders and...any person who has responsibility for supervising staff'.

A detailed statement of internal communication objectives and actions is being prepared and should be issued in the next few months.

The conference was refreshingly positive, and this was reflected in this representative selection of comments made by delegates in the concluding plenary session:

'There's a dramatic increase in professionalism evident among conference participants.'

'People are appreciating the need for an overall corporate identity. Divisions are strong in themselves, but they also need a strong corporate banner.'

'There are very positive feelings among participants — a strong sense of unity and that we all have an important role in the future of CSIRO.'

'Despite [my] initial cynicism, the conference proved to be extremely beneficial.'

'CSIRO can't develop a research policy without also developing a communication policy and having communicators involved in senior management.'

'There has been a loss of the sense of belonging to an organisation since the 1970s. There is a need to regain a sense of corporate identity, and the role of the communicator is very important during this complex time.'

'We still have the problem of resources — it's hard to change when fighting against other priorities.'

Director of the Bureau, Mr Peter Dunstan, summed up the deliberations of the conference in the final session.

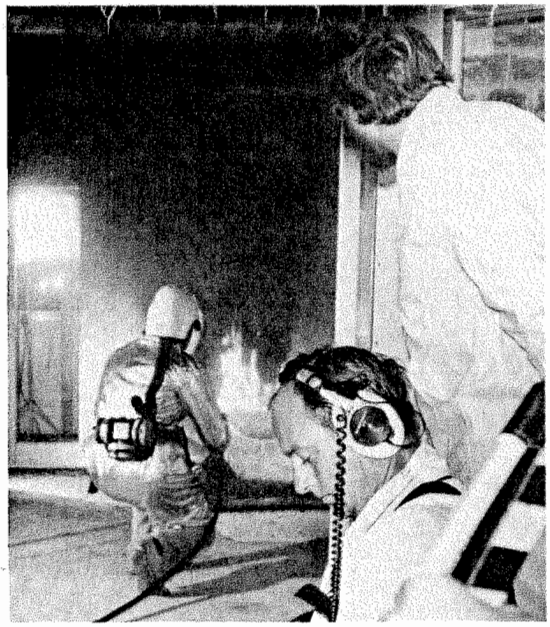
He said it was clear the communicators had recognised the changed environment they were now operating in, 'and the fact that science is shaping our society and yet we have a public which is ignorant of science, so we've still got a long way to go'.

A number of points arose from the conference discussions. Among these was concern about the new corporate identity which is now being formulated.

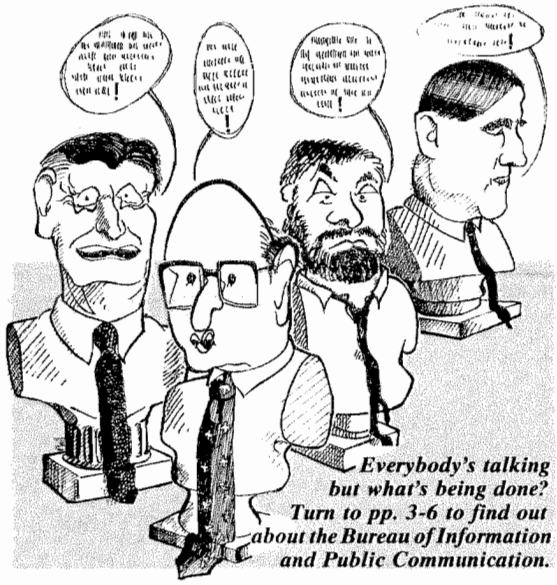
'The need for it to be something which relates to the divisions is absolutely understood,' said Mr Dunstan. He emphasised that a corporate identity created without reference to the divisions would be unworkable.

Another point which emerged was the need to better explain the role of the Bureau (see special feature in this issue).

On internal communication, he said a number of issues were made at the conference — eg. the need to communicate CSIRO's role to all staff, to identify information needs and procedures for regional information exchange, the encouragement of an open-door policy and the need to monitor the effectiveness of internal communication.



A film crew from the ABC Quantum *program spent two days filming work by the Division of Building Research on bushfires and housing earlier this month. The five-person team filmed Dr Caird Ramsay and his fire researchers using embers to simulate the burning of furniture after flaming debris had entered a house in a bushfire; tests where a gas furnace is used to assess the fire performance of windows, and a spectacular 'corner room burn'. The latter test involves constructing a corner of a typical family room within the Division's new international standard burns facility, and igniting it. The reproduced room (complete with coffee table, lamp and even pictures on the walls) was all the film crew could have hoped for, providing a spectacular backdrop to an interview with Dr Ramsay by Andrew Macfarlane of the ABC. The 15 minute* Quantum *segment is expected to go to air in early May.* *Photo: Tracey Nicholls*



Everybody's talking but what's being done? Turn to pp. 3-6 to find out about the Bureau of Information and Public Communication.

DBR to stay in CSIRO

It's believed the threat to remove the Division of Building Research from CSIRO has been averted.

An official announcement has yet to be made, but it has been reported that Federal Cabinet has made a decision on the future of DBR and the Government-run National Building Technology Centre. It's believed they will remain separate entities but with substantial 'cross-fertilisation'.

CSIRO, and particularly DBR itself, was opposed to the plan for the Division to be taken over by the NBTC (see *CoResearch* No. 289, December 1985). The plan had been strongly supported by the Department of Housing and Construction which operates the NBTC.

Commenting on the report, DBR Chief Dr Lex Blakey said that while the outcome 'could have been worse', it didn't turn out entirely to his liking.

'The best outcome, as I see it, would have been for us to take them over,' he said.

It's understood DBR will now be represented on the advisory board of management of the NBTC, while a representative of NBTC will sit on DBR's advisory conference.

The Building Research and Development Advisory Committee (BRDAC), which is likely to expand its membership to include CSIRO, will administer a fund to be established for building research projects.

Industry will be approached to provide funds, and if it agrees to do so, DBR and NBTC will also be expected to contribute a substantial sum each year to the fund.

From the Chief Executive

A column by Dr Keith Boardman

At its recent meeting at the very pleasant facilities of the Division of Molecular Biology, the Board considered the pros and cons of breaking the CSIRO linkage with the Public Service Board in favour of co-ordination by the Department of Employment and Industrial Relations.

The ASTEC Report on CSIRO recommended the ending of the statutory relationship between CSIRO and the Public Service Board to give CSIRO greater flexibility in staffing policies and in setting terms and conditions of employment. The Government decided that the Minister for Science should examine the matter further following consultation with the CSIRO Board and relevant staff associations.

To help clarify the advantages and disadvantages of breaking with the Public Service Board, I had discussions with Mr Visbord, head of the Department of Employment and Industrial Relations (DEIR). He indicated quite strongly that co-ordination by DEIR would not necessarily mean greater flexibility for the CSIRO Board in setting employment conditions or contracts of service with staff. The Department has a responsibility on behalf of the Government to ensure that statutory authorities follow government guidelines in regard to salaries and other conditions of service. The CSIRO staff associations have indicated their opposition to a change from CSIRO's relationship with the Public Service Board. Nonetheless, CSIRO needs to further develop conditions of service which provide incentives for greater mobility of staff and commercialisation of research results.

The CSIRO Board decided that there were insufficient demonstrable advantages to CSIRO from ending the statutory relationship with the PSB, but they requested that I have discussions with the Chairman of the PSB on those matters where CSIRO needs more flexible arrangements. Recent government decisions on streamlining the Public Service should assist these discussions. The Public Service Board has already announced more flexible arrangements in the staffing of government departments, and these will be examined for their applicability and advantage in CSIRO.

With the strong support of the Board I have contracted with McKinseys to examine the top management structure in CSIRO, having regard to the principle role of CSIRO as a strategic research organisation, the Government decisions on the ASTEC review and the need to improve the transfer of research results to industry and other users. I have also asked the consultants to comment on the structures needed to support the top line managers.

I have stressed the urgency of this strategic review, and the need for the Board to make early decisions on the proposal from the CSIRO Management Committee for a new institute structure which has greater sector orientation for the individual institutes.

At its February meeting, the Board had a preliminary discussion of the institute structure, and the roles of institute directors and chiefs of divisions but it agreed that these matters could not be divorced from a consideration of the organisation of research projects. The Board agreed that I should bring forward a top management structure for their consideration, but addressing at the same time project organisation and management processes.

McKinseys will be consulting as widely as possible in the Organisation within the time constraints I have imposed for their report to me. I am indeed anxious that we move to the new institute structure as soon as possible.

K Keith Boardman

Letters to the Editor

Dear Editor,

The 1986 Annual Report of Sirotech Limited conveys a very strong but, I hope, unintended message. There are photos of 32 individuals in the Report; with one exception all the photos of men are in colour and all of women are in black and white. Does Sirotech really believe that women pale into black and white insignificance compared to the colourful, multi-dimensional, professionally-posed males?

Will Steffen
Information officer
Div. of Environmental Mech.

(Editor's note: Carmel Macpherson from the EEO unit has also recorded a number of 'negative observations' — from both men and women — about perceived sexism in the Sirotech report. Perhaps a Sirotech official may wish to reply.)

Dear Editor,

Yesterday [31 March] I attended a briefing of senior CSIRO researchers by McKinsey Consultants in which we were presented with a recommended procedure for evaluating potential research projects in CSIRO.This procedure, in a sentence, was to only undertake projects which a commercial organisation would be willing to pay CSIRO to do. It was not quite that simplistic but I do not think I am doing the presenters an injustice in putting it like that. It was claimed that the procedure would be appropriate for some 75 per cent of CSIRO's research effort.

The basic message was accompanied by a long boring presentation on how McKinsey undertook such an evaluation of a project on rare earth processing. It was boring (unless you were hooked on rare earths) because the underlying methodological principles of the evaluation procedure were hidden, or even unrecognised, amongst the case study details. The procedure seemed to combine old-style benefit-cost analysis (sans dollars) and a mystical steeping of the analyst in the organisation of the relevant industry to get the 'feel of the market'. As a perceptive question elicited, this is the same stuff as McKinsey have been hawking around their commercial clients for years — the secret of success in consulting is to find something you can sell over and over again. It is expensive of course — only warranted for large projects — and requires too much expertise for CSIRO to do itself, although there is a stripped down version for small projects which seemed to involve making four guesses and waiting for enlightenment.

I was startled by the enthusiasm with which the most senior people present accepted this narrow-minded message (enthusiasm seemed proportional to salary); it implies treating CSIRO as a commercial research organisation with no regard for the national interest outside the 'What's good for General Motors...' argument. Even then, knowing CSIRO, we will probably end up subsidising General Motors! There is a whole literature on technology assessment which attempts to consider the externalities, the full range of social and environmental impacts, created by new technologies. There is a whole literature on future studies which attempts to look further ahead than profit discounting allows.

I want to work for a CSIRO which has a vision of Australia as a good place to live and uses multiple social, economic and environmental criteria to choose research projects accordingly. If we can't have that then let's have a truly commercial research organisation with the initiative to make its own decisions in its own way, unencumbered by the non-commercial 25 per cent of CSIRO.

Douglas Cocks
Division of Wildlife and Rangelands Research

Of Equal Concern

It is two years since the appointment of the first EEO contact officers at all CSIRO locations with more than 30 staff. What follows are answers to the most commonly asked questions about these officers.

Q:How many are men?
A:30 per cent

Q:What percentages come from various classifications?
A:47 per cent clerical/administrative; 17 per cent experimental scientist; 15 per cent technical; 11 per cent SSOs. It is very disappointing that there is no representation from certain classifications.

Q:How do they get appointed?
A:Theoretically they apply and are judged against selection criteria by a panel in the divisions made up of a majority of people from the designated disadvantaged groups. In reality I know that some volunteer, some are 'volunteered' and some are legitimately 'selected'.

Q:Do they get time release from normal duties?
A:They are entitled to half a day per week.

Q:What are they supposed to do?
A:Provide the contact point for EEO matters within the workplace:

disseminate EEO literature and advice;

liaise with and advise me of local requirements concerning EEO;

inform local management of the need for EEO initiatives &/or policies.

Cont. on p.8

Chance for fishermen to hook a big one

Marine Laboratories are entering the lottery business — but not in competition with the commercial lotteries.

The free 'gamble' will only be open to people who have found tags from southern bluefin tuna.

Lotteries are a well-tried method of encouraging fishermen to return tags to organisers of tagging programs, but this is the Lab's first venture into the lottery stakes.

Scientists at the Division of Fisheries Research say they hope to receive tags from up to 200 fish during the 1986/87 season.

More than 10 000 southern bluefin tuna were tagged off the south coast of Western Australia and off South Australia in the Great Australian Bight during 1983 and 1984. Of these, more than 4000 have already been recaptured and their tags returned to CSIRO.

Every Australian resident who returns a tag before the end of June will be eligible to participate in the lottery. The first prize is $1000, with $600 and $400 for the second and third prizes.

They will be drawn by a 'local identity' in Port Lincoln on 17 July.

Researchers hope the lottery will encourage people to return tags they have recovered in previous years, but for some reason have not sent on.

The recapture of tagged fish that have been at liberty for long periods provides vital information on subjects such as natural mortality, fishing pressure, migration and growth.

Everyone who forwards a tag receives the usual $5 reward, but now they also have a chance for the 'big one'.

April 1987

Special Feature

Bureau of Information and Public Communication

BIPC — making communication a top priority

Communication is no longer a side issue — it's becoming an integral part of a scientist's work. That's the message now being pushed by CSIRO management.

A concerted campaign to marshal communication resources is now underway. This is taking place on two fronts — at the 'corporate' and divisional levels.

The Bureau of Information and Public Communication (BIPC) has the broad task of increasing awareness of CSIRO's activities in the general community, in government and industry.

The aim is to provide an integrated scientific and technical information service of excellence. Its wider, long term goal is the stimulation of public awareness about science and its importance to Australia's future.

But communication procedures can't just be imposed by a remote, centralised bureaucracy, hence the importance placed on working closely with divisions by the BIPC Director Mr Peter Dunstan.

In fact, the Myer report on external communication, released in 1985, recommended that divisions and units should have principal responsibility for external communication activities.

'We are working to ensure that we structure effective relationships with the divisions. This is not just visits. It's understanding the work and what we can contribute to it in spreading the word to the community,' he said.

CSIRO's central communication set-up has long been criticised, in many cases by divisional scientists. It's clear that a number of people are also unsure of just what the professional communicators do, and therefore have tended to dismiss their work as a waste of resources.

'I believe the Bureau has a very considerable number of dedicated and talented people who have been doing a lot of excellent work,' said Mr Dunstan.

'This has been shown in many aspects, such as the library system, the media coverage that's been achieved, the awards won by our videos and the very favourable reader assessments of publications such as *Ecos* and *Rural Research*.

'Perhaps the people have been so busy and involved in a wide range of areas that they haven't been able to bring it all together and clearly communicate to everyone what they've been doing,' he said.

'I can only stress that the Bureau has been doing some important work, and now it's a case of a new direction, and ensuring that we do communicate what we're all about.

'If we talk about a central policy or a certain amount of co-ordination to allow us to be more effective, people immediately are suspicious. However, it is necessary to complement divisional communication with an overall corporate communication policy to provide direction.

'I do understand the decentralised nature of the Organisation, and how it's vital to be able to work closely with divisional staff.'

'It has been obvious to me in the little over a year that I've been here that the Bureau's role is not understood and therefore I would hope that this article would help to address that,' said Mr Dunstan.

Priorities for the BIPC have been set in two stages. In the first stage these are:

- enhanced information resources for CSIRO scientists
- improved public perception of CSIRO and its relevance
- structured communication to targeted groups
- improved internal communication

In the second stage, they are:

- assistance to institutes and divisions in developing and implementing communication plans
- improved marketing of publications and information products and services
- evaluation of progress.

'The Bureau has a very important responsibility to ensure there is a well-informed perception of CSIRO in the community — that we communicate effectively with crucial opinion formers and that we have a very clear, consistent and sharp message,' he said.

'We are concerned with providing a top professional outfit to assist CSIRO, particularly at the corporate level.

To do this, the Bureau has been restructured into five distinct units (see other stories in this feature).

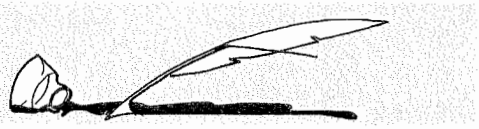
Mr Dunstan said the restructuring is designed to enable the most effective implementation of communication policies.

With the restructuring have come some new directions, including moves to step up the services to divisions offered by the CSIRO Press and CSIRO Printing Centre, 'sharpening' and co-ordination of the Organisation's information network, examination of the implications of 'the library of the future' (eg. laser disk storage) and of desk-top publishing, the use of high-profile public events like the Royal Melbourne Show and greater use of television and radio.

'We see ourselves as taking a much higher profile in the provision and marketing of information.

'We need a stronger and more positive marketing approach in the Bureau's activities. Hopefully this will allow us to generate funds to provide an even more professional bureau.

'I believe we are making progress, but fundamental change is slow. We had so much which was very good, so we are mainly looking at changes of emphasis and direction.



The idea for this feature came out of a meeting between Bureau Director Mr Peter Dunstan, the CSIRO media group and Canberra divisional communicators. One of those communicators pointed out that to many divisional people, the activities of the Bureau (and of its predecessor, the Bureau of Scientific Services) were unclear. She suggested that a feature outlining the aims and functions of the BIPC would encourage greater co-operation with divisions and scientists. As Mr Dunstan commented: 'It has been obvious in the little over a year that I've been here that the Bureau's role is not fully understood'. Hopefully this feature will help redress that problem.

'Wimps' striking back

An exasperated remark from the Federal Science Minister Mr Barry Jones served to highlight the need for an organised rethink of CSIRO's communication effort.

Mr Jones said scientists were 'the wimpiest collection of lobbyists imaginable' as the devastating 1984/85 science budget was brought down. Scientists paid the price for past inaction on communication with severely curtailed research budgets.

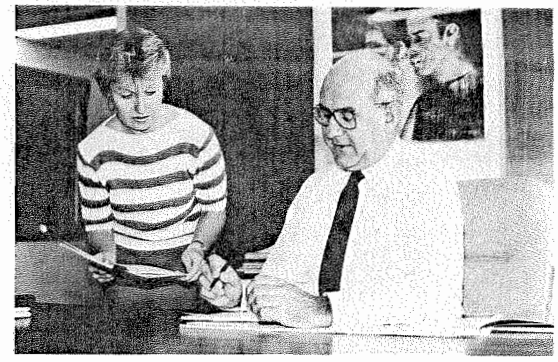
Not that Mr Jones' remark actually started the reform ball rolling. Much reviewing had already taken place in the short history of the Bureau of Scientific Services (the forerunner of the BIPC). BOSS had been established in 1978 as a direct result of the Birch Inquiry. Since then a number of reviews of various BOSS units and functions were undertaken.

A review of CSIRO's library and information services was completed in 1984, its international activities (1983) and its external communication (the Myer report, 1985). A Consultative Council sub-committee examined internal communication in 1985.

The Bureau itself was reviewed just before the retirement of its director in 1985.

The various reviews pointed to the need to boost communication effort in a variety of areas. A new direction was called for, and this partly involved creating a new, larger Bureau headed by a director. In November 1985, the Organisation appointed Mr Peter Dunstan — a long-time senior marketing and corporate affairs executive at Unilever — to the job.

Since then, an 'action plan' which re-organised responsibilities and activities in the Bureau was endorsed by the Executive and is now being put into practice.



Mrs Karen Robinson (personal secretary) with Bureau Director Mr Peter Dunstan. *Photo: Ross Kingsland*

A brief synopsis of BIPC units

(see more detailed stories in this feature)

Information Resources Unit: co-ordination and support of CSIRO library network. It holds the largest collection of published scientific and technical information in Australia.

Printing and Publishing Unit: the Bureau's editorial, printing and publishing service. Responsible for production of the Austalian Journals of Scientific Research, plus a large number of other publications. Provides support for the publishing activities of divisions.

Public Communication Unit: aims to ensure the public and specific target groups are well informed about CSIRO's work. It includes the media group, and produces a range of films, videos and popular science publications.

Public Affairs Unit: monitoring public issues to ensure CSIRO makes a positive contribution to debate on the subjects. The unit seeks to develop strategies for effective communication with appropriate external groups.

National Information Network: maintaining a national information service for industry as well as other research bodies and the general public. Developing specialised directories, telephone procedures and other mechanisms necessary for the effective handling of external enquiries and referrals.

CSIRO's role as information source to be boosted

'If we play our cards right, in five years' time CSIRO will be as well known for its information service as it is for its research excellence.'

That's the view of the acting manager of the National Information Network, Dr Michael Dack.

The Network, comprising about 17 people, is designed to co-ordinate the effort of Bureau information staff in seven capital cities.

'There have been information managers in the capital cities for some time. Previously they have tended to develop their own methods of operating according to their own needs.

'But what we are trying to do now is make the Network better than just the sum of its individual parts — by working together as a team, communicating with each other, sharing our problems and developing systems together,' said Dr Dack.

The three goals set out for the new Network are: to improve CSIRO's capacity to act as a major provider of scientific and technical information in Australia; to assist divisions in strengthening the market orientation of CSIRO's research; and to develop further inter-divisional collaboration in communication matters and bureau-divisional linkages.

Part of the process of better communicating will involve boosting the sales of the Organisation's information products and services, especially through the publications sales office in Melbourne.

Dr Dack said there were also moves afoot to charge for giving expert advice, especially to industry.

'Somehow we've got to start charging people for the services which have hitherto been free — especially to industry which is often able to make a dollar out of our advice,' he said.

The details of charging for advice have yet to be determined.

The Network encourages enquiries from the general public, and the information telephone number is at the top of CSIRO phone book listings.

Dr Dack said the information managers act as a filter, weeding out the trivial or general questions, and passing on the more technical enquires to divisional experts or to sources outside the Organisation.

Dr Michael Dack *Photo: David Salt*

'We're trying to become more aware of divisional communication programs and to create more collaborative opportunities such as the Orange Field Days and the International Technology Exhibition held recently,' he said.

One problem raised by some divisional chiefs is that researchers are already stretched to the limit by their work and divisional communication activities, and are unwilling to take on a greater load.

'Some reports we've had say that chiefs are quite happy with the existing contact they have, especially with industry, and that if through our activities more enquiries resulted, they could not cope.

'But as a national resource, CSIRO has the potential to be just as beneficial to the nation through its information service as it can through its research,' he said.

'Most chiefs would regard this as a heresy, and I can certainly see their point of view.

'On the surface this may seem quite an extreme stance, but my view is that CSIRO was set up to assist the development of this country, and though we are primarily doing this through research, in the process our scientists have gathered together such a store of information that it makes common sense to share that information with whomever can make use of it,' he said.

The information managers receive a wide variety of questions. Among these have been: 'how can metals be joined on to ceramics (high tech company, Adelaide); 'how can we detect leaks in plastic pipe systems?' (spa bath manufacturers, Perth); 'which plastics do not melt in the sun?' (garage door manufacturer, Sydney); and 'how can diamond bladed saws be made?' (manufacturer, Melbourne).

Dr Dack said the answers to these and many other questions could be crucial to the companies involved.

'We are able to search computerised databases to see if there is an answer in the literature to a question or an expert available on the subject. Our managers can do that on the spot.'

Among the projects planned by the Network for this year is a series of 'CSIRO information weeks'.

'In a joint project with divisions, we will put a bank of telephones into a division and invite the public to ring with enquiries, just for that week. The phones will be manned by some information personnel, but mostly scientists.

'We will promote the weeks by getting scientists onto talkback radio, television and into newspapers.'

The information weeks planned for this year are: food (Sydney), 'paddock-to-plate' (Brisbane), water (Perth), diet and health (Adelaide) and weather and climate (Melbourne).

'The Network will cope with any extra enquiries generated as a result of promotional exercises of this sort,' said Dr Dack.

Another project in the planning stage involves direct assistance to school students through the formation of a CSIRO education information service.

'We intend approaching organisations with a stake in Australia's future — banks, insurance companies, etc — to obtain sponsorship to employ a teacher full time.

'If, therefore, a student rings one of our information managers requesting information for a project, it could be referred to the teacher who would have prepared material readily available,' he said.

'We hope to centralise the educational service and yet still use the managers locally to take the initial calls.'

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This feature is intended to present an outline of the work of the BIPC. For more specific details, contact the managers of units in the Bureau (listed on page four of this supplement).

Next month we will have a feature on the Division of Mineral Engineering.

'Issue management' plan being implemented

The Public Affairs Unit has been established to look at the broad sweep of community interest matters on which CSIRO should take a stand.

It will 'manage issues' by monitoring the political, economic and social forces shaping public opinion and to ensure 'there's a CSIRO position in areas of public interest, so we can use issues to our advantage,' said Mr Dunstan.

'We want to make sure that an issue doesn't develop in a way which could harm the Organisation.'

Mr Dunstan said he and the new Public Affairs Unit officer Mr Lindsay Bevege were drawing up a list of priorities, and one of the Unit's first tasks would be to examine just how CSIRO would like to be perceived by the community.

More specific issues are also being looked at. For example, a major concern is CSIRO's involvement in the education sphere.

'We have a very large number of important projects and we need to think through how CSIRO can contribute to educating young people in science and technology,' he said.

Other potential areas of issue monitoring include genetic engineering, food irradiation and conservation matters such as rainforests and kangaroo culling.

'We have also identified the need to speak in general terms about research and development and its importance to this country.

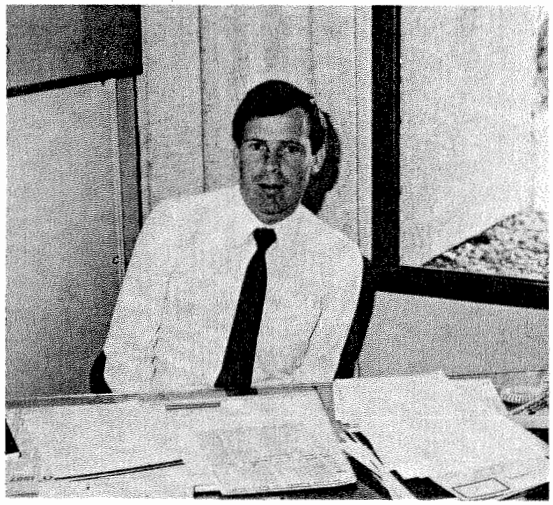
'In order to take a stance on these matters we must fully understand where the pressure is coming from, the key people involved, etc.

'Business is a very important group, and we're examining the possibility of a series of seminars in conjunction with major business organisations. In addition we are looking at special functions for business leaders in conjunction with the Chairman and the Chief Executive.

'An enormous amount of homework has to be done on this, but I have secured co-operation in principle from a number of executive directors of business organisations.'

A greater appreciation of issues in Australian society will ultimately have an impact not only on communication matters but also on the Organisation's research programs.

The range of issues which may impinge on the Organisation is increasing because of the apparently escalating need for restructuring the Australian economy to accommodate new processes and industries. This is a path to which CSIRO is already committed.



Mr Lindsay Bevege *Photo: David Salt*

Divisional communicators are reminded that a computer database of CSIRO news releases exists, providing an easily accessible record of CSIRO achievements and announcements.

Users, including CSIRO, government and industry, can search the database using key words.

At present, all releases issued by the media group in Canberra, and releases from some divisions, are included.

There is scope for other divisions to include their releases, making the record more comprehensive. Divisional communicators are invited to participate in the database, known as NREL and operated through AUSTRALIS. For inquiries, please ring Sue Harvey at the Information Resources Unit on 03-418 7333

PCU — 'the time is right to boost communication effort'

While the Public Communication Unit has many things in common with its predecessor, the Science Communication Unit, it is operating in quite a different climate.

Mr Brian Woodruff, acting manager of the Unit, said 'the new ingredient in terms of public communication is the appearance of Neville Wran as Chairman.

'For the first time we have a very high profile non-scientist leading the Organisation — someone who is prepared to speak out and be seen by the media as a spokesperson,' he said.

CSIRO has been attempting for some time to change its communication direction, but the time has never before been so right.

'In the current debate about the economic future of Australia, science is being seen as an important factor in moving the nation out of its financial plight.

'CSIRO is now in a climate where many of the things it said in the past that fell on deaf ears are now being heard. Suddenly it's easier to do things,' he said.

'There is a will to communicate, and that is infectious.'

Several major communication projects are being undertaken to take advantage of these new and positive conditions.

One is the development of a 'corporate identity'. This will involve a logo, slogan and a more systematic way of presenting published material, advertisements and other visual material.

An outside consultant will design a new and unified public face for the Organisation, emphasising the 'Australianness' of CSIRO.

'It's important that we portray CSIRO as a specifically Australian organisation,' said Mr Woodruff.

'We've had feedback from overseas trade commissioners saying that because of the word "Commonwealth" in our title, some countries see it as a British organisation.'

'We don't see the corporate identity package as just selling an image of CSIRO. A corporate identity is only as successful as the substance behind it,' he said.

'We want to produce an identity that can be used systematically to draw attention to the good work CSIRO is doing.'

It's hoped the package will be ready for Board approval within two or three months.

'We're working on a small budget, compared with what some large organisations spend on a corporate identity.

'But our needs are very different from those of an airline or a bank or company selling a consumer product.

'While producing a consistent image, we want to have some flexibility on how the logo is applied. We are not looking at total uniformity.'

CSIRO divisional communicators were shown a presentation by a corporate identity consultant at the SciComm conference late last month.

*The PCU has three target groups — the mass media (including business-oriented media), opinion leaders in government and industry, and, increasingly, the Australian education system.

This year the PCU will open two new Science Education Centres — in Hobart and Sydney — and there are plans for several more. Those already operating in Adelaide and Melbourne have been extremely successful.

At present, the State education departments have been seconding teachers to the centres at no cost to CSIRO, but in Sydney the centre will be run through the TAFE system. It is hoped the centre, to be operated from the Division of Applied Physics at Lindfield, will become the model for future TAFE-backed science education centres.

*Other important elements of the PCU's communication effort are the activities of its Film and Video Centre — including television films and special targeted videos for divisions, the media group and the popular magazines *Ecos* and *Rural Research*.

A commercial mailing house has been engaged as part of plans to further promote these magazines and build up the subscription lists (especially since the magazines' free mailing lists have been axed).

A recent consultant's study on the readership of *Ecos* and *Rural Research* was extremely favourable.

*The PCU is not limited to external communication — it also has a role in internal communication.

One boost to this recently has been the SciComm conference (see story on page 1).

About 90 participants from CSIRO locations around Australia converged on Queanbeyan (just outside Canberra), not only to discuss how to enhance communication links with the outside world, but also to exchange information in the interests of better internal communication.

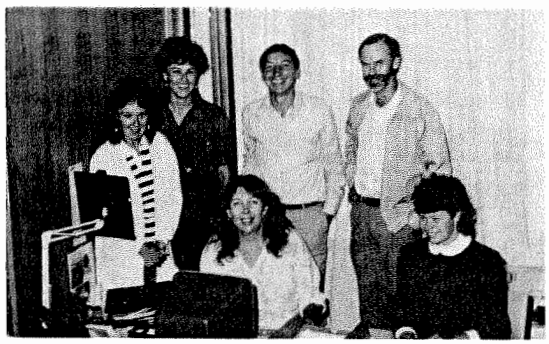
Mr Woodruff was confident the conference would help build a better team spirit among CSIRO's communication staff — both in divisions and the Bureau.

'One of the things the conference did was to highlight the complementary jobs of divisional communicators and those in the central groups.

'I believe the PCU should be involved in the corporate activities of CSIRO — things that go right across the Organisation that central groups can do effectively — and we should leave to divisions things best done by them.

*A range of other communication activities involving the PCU are: CSIRO *Research for Australia* booklet series; a module in the Bicentennial travelling exhibition to 34 cities and towns during 1988; a major presence at the Royal Melbourne Show this year and a guest display at the new Westpac Museum in Sydney; and, of course, *CoResearch*.

Acting manager of the PCU, Mr Brian Woodruff, and his secretary Ms Barbara Durie. *Photo: David Salt*



The CSIRO media group, part of the PCU. Standing, left to right, secretary Chris Hawker, journalist Robyn Ronai, acting senior media liaison officer Tom Gosling and journalist John I'Ons. Seated, CoResearch *editor Liz Tynan and journalist Ellen Peterson.* *Photo: David Salt*

More publishing likely with advent of CSIRO Press

The Publishing and Printing Unit, as its name implies, handles a wide range of publication activities.

CSIRO first entered the book publishing business in a significant way in 1975. This followed suggestions by Dr Clive Coogan in his report on science information which he presented to the (then) Executive in January 1973.

He saw the need for a greater CSIRO involvement in all forms of publishing and indeed he first proposed the idea of establishing a CSIRO Press which, this year, has finally become a reality.

CSIRO has always given its scientists encouragement to publish books in the open market, but it has been slow to help them publish the more specialised works which often fail to excite sales hungry commercial publishers.

CSIRO's modest book publishing program of 10 to 12 titles a year is likely to increase substantially from now on.

The reorganisation of the old Editorial and Publication Service as it was in CILES (Central Information, Library and Editorial Section) has emerged as a new part of the BIPC under the name of the Publishing and Printing Unit.

It consists of two parts — the publishing arm is the CSIRO Press in East Melbourne and the printing activity takes place in the Printing Centre in Collingwood.

The locations have not been changed, so publishing enquiries may still be answered at 314 Albert Street, and printing problems may be discussed by contacting the Printing Centre at 14 Rokeby Street.

There is no intention to expand the facilities in the PPU to cater for the increased activity. There will be a greater concentration on supplying all CSIRO staff with better advice and help them to produce their own publications more economically and professionally close to their own locations.

Help with planning and defining markets for publications will be expanded. Sales networks will be extended both in Australia and overseas.

Co-publication, which has proved to be a most successful method of reaching bigger markets around the world as

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CSIRO and its forerunners, the Institute of Science and Industry and the Council for Scientific and Industrial Research, has been publishing scientific serials and monographs for 70 years. The first Bulletin in the rong-running story of the cattle tick, was issued in 1917. The series continued until 1979 when a revision of an earlier contribution on soils of the Murrumbidgee irrigation areas appeared as the 297th of the series. The *Journal of the CSIR*, an omnibus publication, existed from 1927 until 1948 when a major change in publishing occurred. In 1948 the Council launched the first of the national journals with which CSIRO has been associated for nearly 40 years. In that year the *Australian Journal of Scientific Research* appeared in two distinct series — physical sciences and biological sciences. These two journals have budded and extended their coverage of Australian and overseas research so that there are now 11 titles ranging from the *Australian Journal of Agricultural Research* to *Invertebrate Taxonomy*, the latest in the series published for the first time this year. Over 800 reesearch articles are published each year in these journals, in a total of around 10 000 pages. It is difficult to imagine that Sir David Rivett in launching the modest series in 1948 would have envisaged such a solid output of research papers 40 years on.

IRU = fast information access

The Information Resources Unit in Melbourne has two aims: to give CSIRO staff the best possible access to the world's scientific and technological information, and to make CSIRO research results widely available both inside and outside CSIRO.

We do this through our library and information services, database production and search services, publication exchanges with other scientific research centres, translation service and computing support services.

The IRU combines most of the resources and activities of the former Central Library and Central Information Service (part of the old CILES).

The IRU continues to coordinate and support the CSIRO library network, to explore new avenues of database production, marketing and user support, and to carry out R&D work for the Bureau in computer technology and software applications.

The IRU is divided into five operational units. The **Information Transfer Branch** is responsible for library-based reference services, document delivery and management of the central library's collection of nearly half a million volumes, together with AUSTRALIS, Search Party and the Energy Information Service.

AUSTRALIS and Search Party are complementary services which assist CSIRO, industrial and other user groups to get access to scientific and technical information maintained in local and overseas databases.

AUSTRALIS was launched in April 1986 with 13 databases and a further five available to CSIRO staff. This has now grown to 20 public and six inhouse, and at least six more will be added this year. As it expands, AUSTRALIS will become a significant revenue-raising activity.

Search Party is a new service, launched at the Information Online Conference in January, which performs computer searches on worldwide online vendors such as STN, Dialog and Pergamon, as well as on all Australian databases.

The Energy Information Service provides publications, training and an enquiry answering service to users in Australia and the Asia-Pacific region, focusing on energy management and renewable energy.

The ITB is now evaluating a trial database on VIATEL, the national videotex service, as well as investigating other new information technologies. Prominent among these is a CD-ROM project, a study running concurrently with one at the Commonwealth Agricultural Bureau International in the UK, to assess the CD-ROM's effectiveness for providing access to information, especially relating to Third World needs.

The primary function of the **Information Acquisitions Branch** is to obtain requested publications in all formats as cheaply and quickly as possible for CSIRO staff. The IAB arranges the purchase of over 12 000 subscriptions, standing orders and memberships each year, with a current annual value of $3.8 million; provides specialist ordering advice; places orders for monographs acquired outside Australia; obtains materials through CSIRO's gift and exchange program with some 7000 institutions worldwide; maintains numerous deposit accounts for the rapid acquisition of low priced material from international sources; and is responsible for receiving, sorting, recording and distributing all library material received by the IRU.

Database production and library cataloguing are the specialist areas handled by the **Information Processing Branch**. The cataloguing team is responsible for all monograph and serial cataloguing for the central library, the Headquarters library and the CSIRO index collection. The catalogue will soon be accessible online throughout CSIRO.

As well as the CSIRO index database from which the CSIRO list of publications may be produced, other databases are also maintained in the branch. Anyone wanting more information should contact the IRU.

CLINES

The CLINES office is responsible for implementing, installing and managing the long-awaited CSIRO LIbrary NEwork System, CLINES. Running on the Geac Library Information System, a software and hardware library management system bought by CSIRO last year, CLINES will give online access and integrated control over all aspects of library management, to CSIRO's 46 divisional libraries and their 133 separate collections around Australia. The system will cater for all ordering of library materials, including receipt and financial control; it will be linked to the National Library's system, ABN, so we can contribute to and benefit from this national co-operative program. It will also offer an automated loan system using barcodes and light pens to divisional libraries.

But its most important function, and the first which will be released, is the Online Public Catalogue, which will enable scientists and librarians to see whether a given book or journal is held anywhere in CSIRO and search on a subject to see what is held by the library network. This catalogue is now loaded and undergoing extensive pre-release testing. *CoResearch* will notify staff as soon as it is officially launched. and accessible.

Provision of computing support services to the IRU is undertaken by the **Information Systems Branch**. As well as providing systems support for almost all the activities mentioned above, the ISB maintains factual numerical databases, the most significant being a 30 000 item database of mass spectra.

Another major activity is the AJSR-Tex typesetting system, which is used to support computer-based phototypesetting of the Australian Journals of Chemistry and Physics, with their complex mathematical text. The branch also engages in R&D aimed at providing the Bureau with a source of expertise in relevant developments in computer technology.

The Information Resources Unit is the central focus of the CSIRO library network and is responsible for standards relating to staff, collections and services throughout. It provides professional in-service training at East Melbourne to newly-appointed librarians and library officers in divisions, and every two to three years organises a conference of CSIRO librarians to discuss matters of common concern and introduce new services and technologies.

The Tasmanian regional laboratory library at Stowell is part of the IRU, as is the translation service, with one translator based in Melbourne and one in Sydney.

The IRU produces several inhouse 'current awareness' publications: SALI (Selected Abstracts: Library, Information) circulated weekly to all librarians and other interested staff; COCO (Communications CSIRO) offered to all people involved in communication; and the CLINES newsletter, keeping many people (including CSIRONET and HQ) informed of all CLINES developments.

All parts of the IRU are dedicated to keeping in touch with CSIRO staff in general, and with members of the library network and information officers in particular, to find out what their information needs are and to respond to these by developing further, relevant information services.

CSIRO libraries provide comprehensive information services to research scientists. Charmaine Klass, reference librarian at the IRU, is shown helping users.

The Headquarters graphic design group, left to right, Mr Brian Gosnell (group leader), Mr Ian Sharpe and Ms Sara Twigg-Patterson.

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Adelaide:	**Ms Virginia Westwood 08-268 0116**
Brisbane:	**Mr Ian Sutherland 07-839 7363**
Darwin:	**Ms Sue Taylor 089-84 3611**
Hobart:	**Mr Bruce Laffer 002-20 6222**
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National Information Network
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Officer: Mr Lindsay Bevege 062-48 4684

PPU
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well as in remote locations in Australia, will continue to play a major part in the distribution processes. Co-operative publishing of this type has been successful with a wide spread of international publishers such as Elsevier, Academic Press, Thomas Nelson, William Collins and Pitman.

The Printing Centre, which keeps in close contact with the commercial printing industry, can offer not only a complete in-house service but can also advise on the best way to tackle printing projects of any size. It keeps a watching brief on the availability of suppliers of typesetting, printing and binding in all the capital cities. The Centre is also able to to buy print very economically as it orders in much larger quantitites than most local jobbing printers who often tender for divisional publications.

A Matter of Opinion

This month's column comes from the acting Director of the Institute of Biological Resources, Dr Joe Landsberg.

Forestry and forest products in Australia are big business. The wood harvested annually from forests and plantations, of which about 66 per cent comes from native forests, is worth more than $600 million per year, while the total value of the forest products industries is over $4 billion.

These are telling statistics in favour of those who argue for the continued utilisation of the forests for wood production, but the matters that cause unease, and strengthen the case for the conservationists, relate to the damage done to native forests and their capacity to recover from that damage. The questions therefore arise: why does so much of our wood come from native forests? Why can't a much greater proportion of hardwood timber and wood chips come from plantations, as all the softwood cut in Australia does?

From the foresters' point of view, forests are an economic resource, and the arguments against using them as such are unrealistic, impractical and often elitist. To the conservationists, natural forests are places of beauty, to be preserved for aesthetic as well as a number of practical reasons. The practical reasons include preservation of invaluable genetic diversity — which increases as forest become wetter and hotter (tropical rainforests contain the greatest number of species per unit area of any ecosystem on earth) — preservation of fauna, maintenance of stable hydrological conditions and prevention of erosion.

Foresters generally argue that we know enough about forests and the way they should be managed to ensure that they recover from logging; in fact they will argue that practices such as clear-felling, followed by appropriate regeneration procedures, improve forests. The counters to the economic argument rest on assertions about the destruction of the 'conservation values'.

Although clear-felling is the most criticised and overtly damaging practice, not all wood is extracted by clear-felling. Various selective logging techniques, and a range of practicies designed to minimise the long-term impact of forestry operations, are also used, and there is little evidence that they do much damage. In addition, it can be argued that an unused and unmanaged forest is really rather useless, even for recreational purposes, while the fire hazard in such a forest will, in due course, become extreme.

But the damage done by any operation may be subtle and the data purporting to show that selective logging has little long-term impact on forests are few and, where they are accessible generally patently unreliable. With regard to fire, those who wish to preserve forests in their (supposedly) pristine state argue that the trees are adapted to 'natural' fire cycles, not to controlled burning for fuel reduction purposes. It is clear that, to obtain the knowledge we need to make soundly-based decisions about forest management will require a great deal of research, much of it at levels and in disciplines little appreciated by those who manage forests or depend on them for a living.

Most arguments are concerned with logging in undisturbed forests. It is inevitable that cutting in such forests will end, as all those set aside for wood production are logged. However, there are vast areas already disturbed by previous logging, or by major fires, for which there is a very strong case for continued management for wood production. These forests vary considerably in type. Each area must be treated on its merits and decisions about management made on the basis of available knowledge and information and assessment of alternative options. An option that must be considered would be to move towards a massive increase in the area of hardwood plantations.

Plantations have many advantages over natural forests as sources of wood supplies. We have more control over the quality and uniformity of the product, which can be manipulated to some extent by silvicultural practices and, in the long term, improved by breeding. Rates of production of useful wood are invariably considerably higher than those of natural forests, and these rates can be estimated with greater accuracy than those of natural forests, allowing better scheduling of harvesting and more accurate economic calculations. Plantations can be grown on poor quality land, or abandoned farmland, where they provide an ecologically acceptable — in fact generally highly beneficial — form of productive land use.

It is remarkable that Australia, the home of eucalypts, has relatively few eucalypt plantations (most of them are in Tasmania) and has done little to improvve the genus. This is in contrast to many other countries — examples are Brazil, Portugal and South Africa — where large areas of eucalypt plantations provide the basis of major industries. The reasons probably lie in Australia's

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Environmental Mechanics looking to the future

The long march of women into the research ranks of CSIRO starts in the high school science laboratories.

Most CSIRO divisions note the relative paucity of female applicants for research and professional positions. This deficit seems to reflect the limited numbers of women with tertiary scientific training rather than some inbuilt female antipathy to CSIRO (and vice-versa).

The numbers of women taking science-based courses in secondary schools falls off rapidly as they progress through the school system. By completion of secondary schooling relatively few women have the necessary prerequisite subjects for entry into tertiary science and engineering courses.

The most refined and unbiased selection process will be largely ineffective in increasing the number of women in CSIRO's professional scientific ranks unless the pool of qualified applicants expands.

This will require, among other things, major changes in attitudes and expectations in female secondary school students. More young women must be encouraged to maintain the scientific side of their studies throughout their secondary schooling and thus at least have the necessary prerequisites to enter tertiary science and engineering courses.

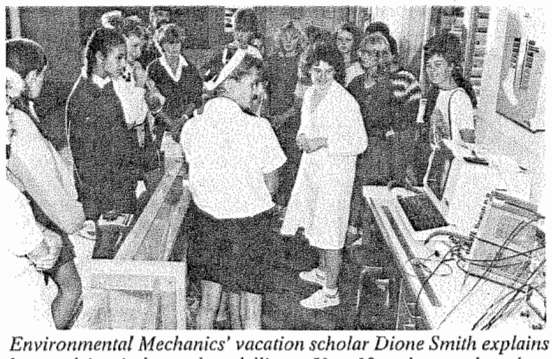
The Division of Environmental Mechanics has recently initiated a program under the auspices of the CSIRO Women in Science project aimed at encouraging female secondary school students to continue with their science studies.

The project is centred around visits to the Division by selected female Year 10 students from Canberra schools. In hosting the visits, the Division says it doesn't seek to preach to the converted. Students chosen are those who are curious about the nature of the work in the physical sciences but, at present, are uncommitted to a career in this area.

During the visits scientists and technical staff discuss not only their research in using the physical sciences to understand the natural environment, but also their educational backgrounds and the paths they followed in pursuing their careers.

The Division hopes that by meeting scientists and technicians and talking with them in their work environments, the Year 10 students will gain some understanding of what is involved in working in the physical sciences.

So far, about 40 young women from Campbell, Watson, Lyneham and Kaleen high schools have visited the Division as part of the project.



Environmental Mechanics' vacation scholar Dione Smith explains her work in wind tunnel modelling to Year 10 students and teachers in the Division's Women in Science program.

CSIRO input for World Expo now wanted

Input from CSIRO staff is being sought for World Expo 88 in Brisbane.

The Expo will run from April to October next year and will be a major feature of the Australian Bicentennial celebrations.

Included will be an Australian Pavillion of some 1200sq. metres to be filled with 'dramatic exhibits'.

It is anticipated that about eight million people will visit the Australian Pavillion — around 30-40 000 per day.

The Expo theme will be *Leisure in the Age of Technology*, and project organisers are now scouring the country seeking appropriate exhibits from a wide range of sources including CSIRO.

'Gee-whizzery'

CSIRO staff may be able to suggest displays of scientific 'gee-whizzery' which will fit in with the general theme.

Using their experience from previous Expos, organisers are working on the premise that visitors will remember very little about detailed exhibits and only the most imaginative of the rest.

So far they have been alerted to holography work of Dr Hariharan's team at Applied Physics, and the associated artists-in-residence.

The good news is that organisers have a budget to develop the ideas accepted.

If you have any suggestions or would like further information, please contact Anne Derham on 03-698 6304 or Ross Kingsland on 062-48 4477.

Primitive man 'rocked around the rock'

Scientists at the Swedish Institute of Geophysical Phenomena in Stockholm have discovered evidence that prehistoric man enjoyed a crude form of recorded music.

Head of the research team, Dr Lirpa Loof, who visited Australia early this month for talks with CSIRO colleagues, said the startling discovery has shattered the belief that ancient Man had little to amusc himself with except cave painting and story telling.

The find was made near Ouagadougou, Upper Volta, in West Africa, about 18 months ago during a research venture to examine potential oil resources in that very poor country.

Dr Loof said circular tablets dating back 10 000 years, painstakingly engraved using unknown methods, had the rudiments of recorded sound when played with a modern-day (slightly modified) needle.

The original stylus was supposedly a thin reed, although no firm evidence of this remains after so many years.

The discovery was made by accident when one of the five-person research team joked with colleagues that the round tablets found at the site looked rather like records.

During a visit to the Swedish Embassy in Ouagadougou the scientist (who had been attending a cocktail reception) asked to try his 'theory' for a laugh. To everyone's surprise the tablet, played at a speed of 33⅓ on the Embassy turntable, produced a discernable tune.

Further research is now underway to determine just how the ancients were able to reproduce sound using primitive methods.

A Matter of Opinion
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sad history of exploitive use of the land, and the perception among the community of woodgetters and wood users that we still have a vast forest resource that can, they believe, be maintained in stable production in perpetuity. It seems that, when weighed against the work necessary to establish plantations, the cost involved and the changes their introduction would necessitate in many established industry practices, their advantages are not convincing.

It would take many years to establish enough plantations to provide the wood needed to replace the pulpwood currently extracted from our native forests, and even longer (between 50 and 100 years, depending on the location) to produce hardwood sawlogs from plantations. The softwood industries accept time scales of 30 to 80 years as routine but, in the presence of perfectly good sawlog size trees standing in the forests, the economic case for accepting slightly longer times to grow hardwood logs is difficult to make.

We need a comprehensive study of the plantation option, including estimates of the productivity of those areas of natural forest managed for wood production, and estimates of the area of plantations, and the time required for those plantations to produce enough pulpwood to meet Australia's projected requirements. Estimates of the likely productivity of the plantations would be required for this. The economics could only be evaluated in terms of a series of scenarios, providing estimates of the consequences of various options and possible (likely?) situations. Whether financial benefits can be allotted to 'conservation values' I do not know but if, in the medium to long term, the economics of substituting plantations for native forests as our source of hardwood do not seem favourable it will be necessary to put a price on the conservation values. Such a study would not stop the arugments, but it would certainly be very informative.

Since we have to commit our research resources I believe we should commit them to making plantations our source of wood chips, and eventually hardwood sawlogs. We have hardly begun to tap the genetic potential of eucalypts, and the advantages of a controlled, high-producing crop must outweigh the 'benefits' of exploiting a ready-to-hand resource. Therefore one of the major thrusts of the Division of Forest Research is towards the genetic improvement of eucalypts and the improvement of hardwood silviculture.

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New detonator research by Geomechanics

The Division of Geomechanics is involved in a project to test the effects on quarry rock fragmentation of very accurate timing of blast initiation.

ICI Australian Operations Pty Ltd is CSIRO's partner in this project and with the Division's support was the first ICI company to obtain the prototype electronic detonators which make this research possible.

It has long been recognised in the mining industry that the millisecond delay blasting technique produces superior fragmentation, leading to reduced secondary blasting or 'popping' and reduced crushing.

The project aims to overcome deficiences in current knowledge by applying a new type of detonator which employs an accurate delay. Industry at present uses a chemical fuse, the performance of which is subject to its age, storage history, temperature at point of initiation and batch to batch variations in its chemical composition.

The trials are being carried out in a granite quarry in East Gippsland, which has a consistent and moderate degree of geologic structure at scales that are anticipated to minimally affect the trials.

The work is on a prototype scale, and the resulting hundreds of tonnes of rock are being sieved and weighed to generate a database for subsequence analysis.

Work skills receive recognition

A CSIRO apprentice was highly commended in a major competition to award skill in the workplace.

Workskill Australia conducts a national series of skill competitions every two years in which apprentices and young tradespeople show their expertise.

Mr Dominic Mulligan is a first class apprentice in the North Ryde Workshops of the Institute of Energy and Earth Resources.

Last year Mr Phil Cahill (apprentice co-ordinator for IEER at North Ryde) suggested Dominic enter in the construction steel category, as Dominic was a metal fabrication apprentice and had done well at Sydney Technical College, coming top in all subjects in his first and third years.

In February this year Dominic reached the regional finals held at Sydney Showground and competed against the best in New South Wales.

It was a sudden death playoff with only one competitor being chosen out of the finalists. Unfortunately, Dominic missed out but he received a certificate stating that he and the Organisation were 'committed to a standard of excellence'.

Citation for polymer work

At the 16th Australian Polymer Symposium held recently in Melbourne, Mr David Sangster of the Division of Materials Science and Technology (Lucas Heights unit) was honoured with a citation from the polymer division of the Royal Australian Chemical Institute.

The award acknowledges his contributions to radiation and polymer research, technology transfer, education and the polymer profession generally.

A similar award was made to Dr G B Guise from the Division of Textile Industry, Geelong, acknowledging his research into polymeric treatments for wool and his outstanding personal contribution to the polymer profession.

Secretaries are often the power behind the throne, but in this case she is at the fore. Diana Bennett, secretary to Dr Angus McEwan, Chief of the Division of Oceanography, took the limelight during the buildup to Secretaries' Week in Hobart. A photographer from The Mercury *newspaper needed a shot, and Diana found herself in the hotseat, with a bit of assistance from acting Chief Dr George Cresswell. Meanwhile, Dr McEwan was busy as an Australian delegate to a meeting of the Intergovernmental Oceanographic Commission in Paris. The mice may play when the cat's away, but Diana assures us this brief encounter was 'all in the cause of duty'. Photo courtesy of* The Mercury.

###

Successful protein workshop

The recent 12th Lorne Protein Structure and Function workshop attracted a record 311 registrants, with 35 from overseas.

The annual conference is organised by a consortium of Victorian research institutes including the divisions of Protein Chemistry and Animal Health.

The conference dinner was enlivened by part-time Board member Sir Gustav Nossal, who made some penetrating observations on the relations between academic research and industry, particularly the new biotechnology-based industries.

Sir Gus stayed on to chair the following morning session — immunochemistry — during which Dr Peter Colman from Protein Chemistry presented the S J Leach Lecture. Dr Colman described his team's recent results on the structure of an antibody-antigen complex.

Another highlight of the conference was a spectacular 3-D computer graphics simulation of protein unfolding, by Richard Feldman of the United States National Institutes of Health.

The audience during the 3-D computer graphics demonstration (not, as may be thought, during the screening of The Blues Brothers*).* *Photo: Leona Monarch*

EEO
Cont. from p.2

Q:What authority does the contact officer have?

A:They have no line responsibility or authority but they are in contact with others who do. If there are any unresolved difficulties at the local level they are advised to refer the matter to HQ.

Q:Are they working for or against local management?

A:If I were being facetious I'd say that depends on what local management is up to! Contact officers are not meant to represent a 'fifth column'. They are meant to alert local management to practices that may leave individuals or the Organisation legally (or ethically) vulnerable. Their role is to work WITH management.

Q:How long should contact officers be in the position?

A:Ideally no more than two years, although there is no problem with incumbents reapplying. Those locations that have not advertised the vacancies for some time should consider doing so as soon as possible.

In summary, the EEO unit believes that the Organisation is being very well served by its EEO officers. There appears to be a very constructive relationship between the great majority of them and senior line management.

As to whether we will always have EEO contact officers...in an ideal world (and Organisation) I would expect to eventually be so amazingly successful that the need for my job will no longer exist. To my knowledge, no-one is organising an early retirement dinner for me THIS year!

Carmel Macpherson
EEO Officer

***CoResearch* is produced by the Public Communication Unit for CSIRO staff. It's also issued to a number of people outside the Organisation who are interested in CSIRO activities. Readers are invited to contribute or offer suggestions for articles. The deadline is the last Monday before the issue month. Editor: Liz Tynan, PO Box 225 Dickson ACT 2602. Ph: 48 4479.**

CoResearch

CSIRO's staff newspaper

No.302 May '87

Information Technology

Work underway to bring Aust up to date

Just what role can CSIRO expect to play in the development of an indigenous information technology industry in Australia? After all, we are so far behind many other countries in the world in this respect that there seems little hope of catching up.

The (relatively) new Division of Information Technology is enthusiastically addressing the mammoth task of bringing Australia up to date. Information technology is one of the keys to raising the level of competitiveness of our industries and improving our economy. It pervades nearly every area of industry, science, government, agriculture, services...the list goes on and on. Perhaps the most useful role the Division can play is to act as a catalyst and a focus for the fragmented information technology sector in Australia.

It's timely to look at how the Division is developing because it has passed through a settling-in period following its evolution from the Division of Computing Research and is now actively pursuing its goals. There is a way to go, however, as a number of research positions have yet to be filled and the full staff complement isn't expected to be reached until 1990.

The first meeting of its advisory committee was held last month in Sydney, and in a very lively discussion, both optimism and cynicism about the future were expressed.

A degree of cynicism was evident from the industry members of the committee — Mr John Dougall, managing director of computer company IDAPS, and Mr Peter Rehn, managing director of Computing Services of Australia, who were sceptical about the possibility of bridging the huge gap between Australia and countries like Japan and the United States in information technology.

They expressed the view that investing large amounts of money in information technology research at the Division was in some ways a misuse of money which could be used more productively. Not surprisingly, this view led to considerable discussion. Despite the reservations, however, the industry representatives offered vital advice about future directions for the Division. The next meeting is scheduled for August this year.

After the meeting of the committee, a more open session which included other DIT staff members (and the *CoResearch* editor) was held to outline the research groupings within the Division, with particular reference to actual and potential links with industry and tertiary institutions.

Later that day, a seminar was conducted to explore with invited information industry representatives and scientists how the Division could best collaborate with them, and address its research to the most appropriate areas. Group leaders again outlined the thrust of their research. More seminars are being scheduled for other cities later this year.

Sophisticated knowledge

The Division's aim, if it can be condensed into a few words, is to research better ways of extracting, presenting and distributing information. This aim requires sophisticated knowledge and use not only of computers but also the latest in communications technology. This was reflected in the participation on the advisory committee of Dr Bob Frater, Chief of the Division of Radiophysics. His Division is heavily involved with high level communications research and development.

Other members of the committee, apart from the Division Chief Dr Tommy Thomas and assistant Chief Dr John O'Callaghan, were Professor Murray Allen, Department of Computer Science at the University of NSW, Mr Neil Pinney, Department of Industry, Technology and Resources in Victoria, and Dr Robin Stanton, Department of Computer Science at the Australian National University.

Information technology has, since 1985, been designated as a CSIRO 'growth area', which theoretically guarantees a certain level of funding not threatened by cutbacks.

Activity in information technology is already spread quite widely among other divisions, such as Manufacturing Technology, Radiophysics, Building Research and Water and Land Resources.

The main aim of CSIRO's information technology work is to rapidly develop a base of scientific and technological expertise so substantial support can be given to assist Australian industry bring internationally competitive products to market from 1990 onwards.

At present in the Australian hardware market 90 per cent of equipment is imported, and this naturally has a detrimental effect on Australia's balance of trade.

Australia now exports in excess of $173 million worth of computer hardware, software and communications equipment per annum — small bickies in the info tech world. An annual export target of $1500 million may seem extravagant off rather a modest base, but this is the aim now being quoted to be achieved in the next decade. The DIT must make a concerted effort to assist Australian industry realise this ambitious goal. Certainly its determination to work with all relevant facets of industry and academia in Australia augurs well.

But greatly increased computer hardware, software and communications systems for export are not the only aims of DIT's work. Domestically, fundamental changes in banking, retail trade, transport, agricultural, resource and manufacturing industries all require increasingly sophisticated technologies as community expectations increase.

For example, readily available facsimile machines are now the norm, and home banking, travel bookings and a generally more cashless society are close at hand. The information revolution has really only just begun, but it is accelerating and the need for a world class knowledge base in Australia has never been greater.

More detailed information about how DIT is approaching the challenge will appear in a *CoResearch* division feature later this year, but a brief

Cont. on p.7

Chairman at education centre

CSIRO Chairman Mr Neville Wran has been making his presence felt throughout the Organisation. He was photographed last month at the CSIRO Science Education Centre, Adelaide, with (from left) Andrew Francis, Hugh Pederson and Melissa Wise from Athlestone Primary School. Mr Wran described the activities at the centre as 'absolutely stunning'.

One of our buoys is missing

The Australian Cancer Society is using a novel means of fund raising and CSIRO is providing support in a number of ways.

The project, Operation Drake, involves placing an instrumented buoy at Cape Horn and following its path for as long as it continues to function, probably one to two years.

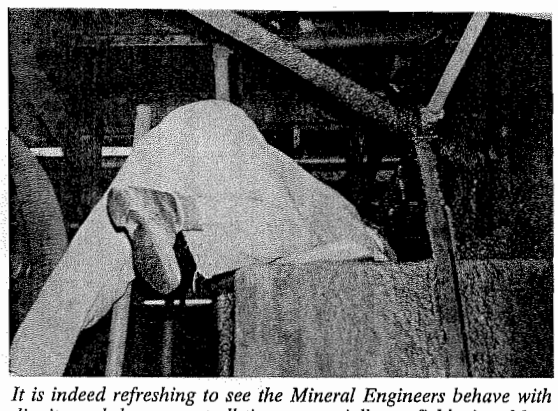
Schools in NSW, the ACT and possibly Victoria will enter a competition to predict the minutes and seconds (but not the degrees) of the location of the buoy on 1 November 1987. Entries will cost $2 and anyone may enter as many times as they wish.

Information of the buoy's movements will be obtained via the ARGOS polar-orbiting satellite and relayed to schools courtesy of Telecom using the CSIRO listing in VIATEL.

CSIRO is also involved through Dr George Cresswell of the Division of Oceanography who is providing advice, while MOONRAKER, a Tasmanian high-tech company will supply a CSIRO-style current drifter buoy for the task.

The buoy will be sponsored by Duracell who will also be putting their product to the test by supplying the batteries.

Apparently the satellite-tracked buoy will be traversing currents which are not well understood at present. Only untracked CSIRO drift cards and the occasional champagne bottle from Dr Nigel Wace, ANU, have been used in the past and their journeys are not clear. It is expected that the buoy eventually will circumnavigate Antarctica in its year at sea.



It is indeed refreshing to see the Mineral Engineers behave with dignity and decorum at all times, especially on field trips. More information on this most fastidious of divisions in this month's Feature, pp. 3-6.

From the Chief Executive

A column by Dr Keith Boardman

The debate in the Organisation on the distribution of our research resources to the different sectors has heightened considerably. This is due mainly to the tightening of appropriation funds, but it is also related to the deployment of some staff and resources from the rural and minerals and energy sectors to the manufacturing and service sectors.

The rural industry divisions argue that a competitive rural industry will continue to be vital to the prosperity of Australia and CSIRO's research effort should be maintained at least at its present level. A similar argument is advanced for the maintenance of the minerals and energy work, although it is conceded that some of our longer-term research on alternative liquid fuels can be deferred.

On the other hand, it can be argued that an economy based so strongly on the export of primary products is increasingly vulnerable in a world where international trade is becoming increasingly competitive and increasingly technology-based.

The divisions in the natural resources area argue that CSIRO has a national responsibility to maintain research which can be exploited for the effective management of Australia's natural environment.

Growth area

Over the past few years the Organisation's policy has been to divert resources into newer technologies such as generic manufacturing technologies, information technologies, biotechnology and space technologies through a growth area mechanism.

This has caused shifts in the balance of research effort between the sectors, but there has not been a systematic approach to balancing our portfolio of research activities.

It is now recognised that we must develop better analytical skills for the evaluation of research, both prospective and retrospective, if we are to achieve greater objectivity in decisions on the broad distribution of resources between research areas.

The re-establisment of a small planning unit as recommended by the review of corporate planning in CSIRO has been deferred pending the completion of McKinseys' study on management structure. Irrespective of any decision to form a central planning unit, I believe that each institute needs a planning capability to address priorities within the sector covered by the institute.

The McKinsey study on the rare earth elements has demonstrated the value of a systematic approach to program evaluation, and the CSIRO staff who worked closely with McKinseys gained valuable experience and knowledge of the methodology used for the rare earth projects. The wider applicability of the techniques to CSIRO projects is being examined by McKinseys.

An important challenge for the Organisation is to increase the proportion of external funding. It now seems certain that CSIRO will be required to substantially increase its external funding next financial year, particularly the contribution from the manufacturing industries. The rural industry divisions point to the much higher levels of industry funds from the rural sector, and argue for the maintenance of appropriation funds to enable them to continue to compete successfully for industry funds.

An examination of the levels of external funding for divisions in 1985/86 shows a very wide disparity. Of 10 divisions with external funding in excess of 20 per cent of total funds, eight are in rural or rural processing and two in minerals. Of 13 divisions with funding of less than five per cent, five are in manufacturing, three in service industries, three in environment and two in rural. Some of the divisions in the manufacturing industry sector receive substantial in-kind contributions from industry, which need to be taken into account in assessing total industry support for their work. However, I believe there is considerable scope to increase the financial support from companies through the 150 per cent tax incentive, although the main aim of that incentive must be towards building up industry's R&D capacity.

Keith Boardman

Board Business

In this new regular section we outline the activities of the CSIRO Board

The new CSIRO Board has met three times since its inaugural meeting in Melbourne just before Christmas. It has met in Sydney, Melbourne and Canberra and each time Board members have met over lunch a cross-section of 'on-site' CSIRO staff. It is proposed that Board meetings in the remainder of 1987 will include meetings (at divisional sites) in all the major capital cities.

In its early meetings the Board quickly focused on the need for an examination of the total top management structure. It was concerned to have a structure with flexibility and one that would provide the best possible support for the Organisation's research managers and scientists — a structure aimed at facilitating the use of larger, multidisciplinary task forces, addressing major national problems and opportunities. It was recognised that the large number of divisions and geographic locations could be inhibiting flexibility. As most staff are now aware, McKinseys has been engaged to provide advice to the Chief Executive preparatory to his making recommendations on top structure arrangements to the Board at the end of this month.

The Board has taken a very keen interest, at each of its last three meetings, in CSIRO's external communication activities. It has looked closely at the content, objectives and target audience of the annual report and has made a number of constructive comments which are expected to be reflected in a smaller, less technical 1986/87 annual report which will be directed at the broad community. The Board also has foreshadowed an interest in institute and divisional reports and whether these can be better targeted and the whole exercise streamlined. More generally the Board has been concerned to see an overall cost-effective plan put in place embracing all CSIRO's external communication activities; the emphasis is on a plan with the most effective balance between the different media forms.

One matter which has aroused considerable interest with scientists, unions and management is the question of whether CSIRO should maintain its statutory links with the Public Service Board or whether it should move to the alternative position of administrative co-ordination by the Department of Employment and Industrial Relations. The ASTEC report on CSIRO had indicated that greater flexibility was needed, particularly in engaging staff, and had recommended that the present statutory relationship with the PSB end; the issue was subsequently debated at some length in Parliament. The Board examined this matter at length at two successive meetings, reaching a view that the advantages and disadvantages of moving from PSB to DEIR coverage were finely balanced. It finally decided that there were no substantial benefits in changing the current arrangements and decided to recommend to the Minister that no changes be made.

At its last three meetings, the Board also discussed and agreed on a draft strategic plan for 1987-1991. The plan is based on general guidelines provided by the Minister (in accordance with the new legislation) and the Minister attended the April Board meeting for discussion of the latest draft. The plan gives particular emphasis to management objectives and strategies (concentration of resources, improved project management and increased interaction with industry) and stressed the intention to assess all programs, current and proposed, against specified selection criteria to ensure the identification of programs leading to opportunities bringing the greatest benefits to Australia.

Another matter which the Board briefly looked at during its February meeting was the important area of property rights and royalties for individual CSIRO scientists (and research teams) and the question of whether some form of personal reward system might be introduced to encourage a more entrepreneurial approach by scientists to the commercialisation of their research. A paper is being prepared drawing on practices overseas and options available and the Board will be examining the matter again soon.

The Board met the full Consultative Council during its April meeting and received presentations from Sirotech and McKinseys at its March meeting. Additional presentations to give the Board a better perspective of the Organisation's activities are planned for future meetings.

Dear Editor,

'Speak out and let your voice be heard'. So runs the exhortation in the brochure *Guidelines on Public Comment by CSIRO Staff*. But in the wake of an article by Dr X in the *Sydney Morning Herald* in April, and in light of the intense annoyance it caused a research group in a sister Division, a clarification of the guidelines is needed.

The central point is the statement in the guidelines that CSIRO staff should 'contribute to public debate on issues within your expertise'.

Dr X's article concerned forest management on the south coast of NSW. Not exactly his 'field of expertise'. Nevertheless, it was a well written, clear and useful contribution to public debate. Unfortunately he made the mistake of overlooking the work of the above-mentioned research group (let's call it research group Y) from his sister environment-oriented Division, work that countered one of his points. Unforgivable? Indeed, according to research group Y. Worse still, Dr X's article dared to criticise the assumptions and approach of the local forestry industry, when research group Y needs the industry's support to continue researching.

Both Dr X and research group Y cite the Guidelines on Public Comment to justify their position. Dr X points out the article appeared with the disclaimer that the views expressed were his, and not CSIRO's. Research group Y says that no-one in CSIRO, but no-one, has the right to publicly comment on a research area and reveal they belong to CSIRO, except for members of the practising research group. They, after all, are the specialists on the point at issue.

So who is right? Dr X's A/Chief backs him implicitly. Dr X has every right, says his A/Chief, to contribute in this way to public debate on such an important matter, and to reveal he works for CSIRO. Research group Y, however, would like to see Dr X disciplined for infringing the guidelines.

Underlying this dispute, however, there lurks a hidden element that is probably behind all the heat. And that is that any public comment by any CSIRO individual which counters the forest industry line will embarrass research group Y, as long as they need the industry's support to operate.

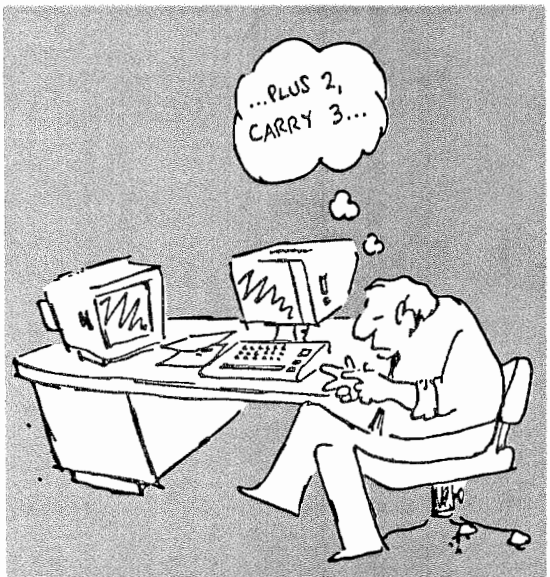
So really there are two issues here. Firstly, we need the guidelines clarified so that they cover situations like this. Secondly, we need to consider whether the sort of compliance that research group Y would impose across the Organisation is healthy. For their own reasons they will not criticise the industry, and they would clearly prefer that no-one else from CSIRO did either. Is it right

Cont. on p.7

Vital research for the minerals industry

The mineral, energy and base metal industries make a major contribution to Australia's livelihood and standard of living, and will for some time to come.

The Division of Mineral Engineering works closely with the extractors, users and marketers of our minerals and fossil fuels, developing increasingly sophisticated technologies for industries in urgent need of them if Australia is to continue to compete in international markets.



Mineral Engineering's backup computer facilities in use during recent VAX shutdown (apologies to S Harris,* American Scientist, *for the modifications to his cartoon)

Taking minerals from the ground and converting them into finished metals products involves many operations from exploration and mining, through to smelting and refining. Historically, the CSIRO approach has been to study and improve these various stages separately, through a number of divisions, but now the aim is to use a total systems approach so that the best overall processing path can be taken.

The Division is spreading its resources fairly evenly across three broad areas — minerals research, energy related research and basic metal products.

In addition, some of the techniques we are developing have wider applications for other industries — for instance, food, manufacturing and agriculture.

Minerals Research:

The Division's efforts are focused on improving existing methods for mineral processing, particularly:

*the design and control of mineral preparation circuits;
*the all important flotation process;
*novel combinations of mineral concentration methods; and
*the development and application of new sensors and instruments.

The Division's automatic mineral image analysis system QEM*SEM (Quantitative Evaluation of Materials by Scanning Electron Microscopy — see story in this feature) is now being marketed by Sirotech as a mineral scanning bureau service. Its generation of qualitative mineralogical data is generally accepted as an exceptional breakthrough in the world of mineral processing.

This unique instrument system can scan an ore sample and quantify the mineral types and position in relation to each other. The final product is valuable information.

In mineral processing, QEM*SEM supplies a detailed interpretation of the behaviour of mineral particles at all stages of concentration and beneficiation and provides key information for effective plant operation, design and project feasibility work.

Energy:

The Division has an integrated program based on:

*development and improvement of techniques in coal mining and coal preparation;
*development and application of new on-line instrumentation for the analysis of coal;
*study of mechanisms of fluidised bed processes of combustion; and
*transport of coarse coal and other materials by pipelines.

Fluidisation is a technique used in the mineral, energy conversion and process industries, for reacting solids with gases, for transferring heat or for steam raising.

Many industries use fluidised beds without necessarily understanding the basic underlying phenomena, thus often overlooking their potential.

Using its large cold and hot fluidised bed facilities which are very close to commercial scale, the Division is able to accurately simulate and monitor bed behaviour, bubble parameters, structural changes and flow patterns, providing valuable information for engineers in many industries.

In combustion applications, the Division has considerable experience with fuels and waste materials, particularly low-grade hard-to-handle fouling and waste coals. For instance, it has found ways by which energy can be recovered from the carbon residual in spent shale, a technqiue which is jointly patented by CSIRO and CSR Ltd.

The Division is now actively marketing the fluidised-bed simulation and monitoring facility. It can design or improve the beds, or devise process control systems and is looking for consulting work in this area.

Basic metal products:

The mining industry urgently needs new and efficient direct smelting methods and this has become the Division's highest priority.

The Division uses four types of investigation: on-site, real life studies into industrial processes; pilot-plant studies at the Division or at industrial sites; investigation into the fundamental science and process phenomena using experimental laboratory techniques; and mathematical modelling.

The Division's work on non-ferrous smelting processes includes the CSIRO patented SIROSMELT technology. Currently the ISASMELT version of SIROSMELT is being used for the direct smelting of lead sulphide concentrates. It is being tested on site on a five tonne scale, after successful smaller scale operations.

Direct smelting of an ore concentrate in a single vessel is becoming a significant alternative to conventional processing in sinter plants, blast or reverbatory furnaces. The capital costs of smelting in small reactors is considerably lower.

Studies have now begun into the fluid mechanics of intensive bath smelting processes, using both laboratory-scale flow visualisation studies of gas injection into melts and detailed mathematical models.

Mineral engineers in the field (see story page four of feature): Terry Joyce 'down the tube' at Adelaide Wallaroo Fertilisers in Port Adelaide.

This feature is designed to represent a cross-section of activities at Mineral Engineering and is not intended as a directory to the Division's research.

Next month we will have a report on CSIRONET.

A tradition of applied research

The Division of Mineral Engineering originated in 1940 as the chemical engineering section of the Division of Industrial Chemistry. By 1950 the section had become the specialist engineering group for the Chemical Research Laboratories, providing facilities and expertise for larger scale chemical experiments and pilot plants for the laboratory, the rest of CSIRO and industry.

In 1958 the section was given independent status and Dr Henry Pratt was appointed officer-in-charge. The section was upgraded to a division in 1962 and Dr Pratt became its first Chief.

The Division moved from Fisherman's Bend to new facilities at Clayton in 1970 and in 1971 became a member of the Mineral Research Laboratories. In 1978 it joined the Institute of Energy and Earth Resources (IEER) and was renamed Mineral Engineering, reflecting the strong alignment of the Division's work with the Australian mining and mineral processing industries.

Following reorganisations with the IEER in 1985, 57 staff from the Lucas Heights and Port Melbourne laboratories of the Division of Mineral Physics were transferred to Mineral Engineering. In 1986, the sulphide smelting and iron ore groups from the Division of Mineral Chemistry also joined the Division.

The Division is now staffed by nearly 200 people, located at laboratories in Clayton, Lucas Heights, North Ryde and Port Melbourne.

Industry involvement and interaction remain key themes in the Division of Mineral Engineering today. It is keen to align its research efforts to the needs of Australia's mineral and energy producers and is continually seeking ways to improve existing interactions. The philosophy of the current Chief, Dr Robin Batterham, is that 'if there is no significant industry support, then it isn't worthwhile continuing the project'.

This philosophy, combined with the Division's tradition of applied research, has resulted in it working with the Australian minerals, energy and base-metal industries on more than 70 current collaborative projects which generate 25 per cent of divisional income.

Industrial collaboration
A divisional perspective

The Division of Mineral Engineering has for many years placed a high priority on interaction with the end-users of its research.

A measure of its success in meeting this goal is provided by the significant revenue raised by industrial collaborations over the years. Currently these collaborations are contributing 25 per cent of the Division's total funding and all projects are supported to a greater or lesser extent by non-treasury funds.

Division Chief Dr Robin Batterham said 'the Division's ability to attract a high level of industrial collaboration results from the emphasis we have placed on maintaining a balance of basic, strategic and tactical work within each project.

'While the main focus is on strategic research, it is recognised that some level of basic and tactical research is also essential. Basic research allows us to develop new methodologies and insights into processes. Without such efforts we rapidly become inept as other researchers around the world overtake us.

'Too much basic research, however, means that little time is available for strategic or tactical work. As a consequence our work would become irrelevant to the time scales of interest in industry,' he said.

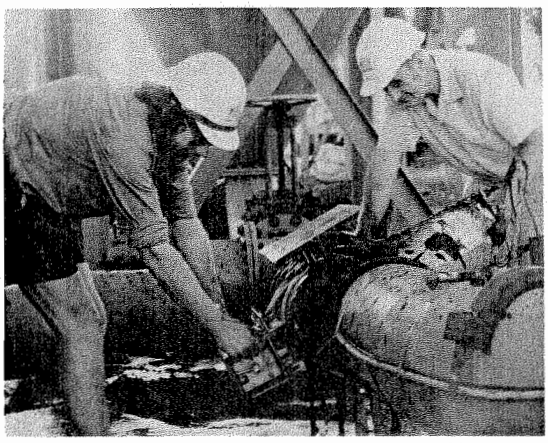
'Tactical work enables us to learn the language of industry, get close to our end-users and help to define the problem areas that are worthy of strategic effort. Too much tactical work in the long run will cause us to degenerate into second rate consultants, as we'll have no time available for basic and strategic reseach.'

At Mineral Engineering, project managers bear the major responsibility for attracting industrial support for their projects. Such industrial collaborations are, in some cases, set up as a result of approaches by industry, but more often industry support is actively sought and attracted on the basis of past performance and perceived importance.

For the project manager, industrial collaboration provides a means of funding travel, equipment purchases and staff salaries, without recourse to shrinking CSIRO budgets.

However, the penalties are real. They include the burden of performing the combined roles of administrator, entrepreneur and researcher, together with the time taken up by phone calls, letter writing, travel, meetings and memos justifying proposed collaborations.

Careful planning is necessary in order to meet externally imposed deadlines and to handle the pressure to solve problems that are tangential to the main line of work.



Lionel Pullman and Wally Brisbane up to their ankles in coal slurry at a test pipeline in Newcastle.

The limited time frame of any collaboration forces a focusing on the objectives and a careful allocation of resources. The Division has written collaborative research agreements for periods from three months to three years. Although there is always the option to renew, in practice it is difficult to plan work beyond the agreed period because the resources may not be there to do it.

Finance obtained from collaborative agreements is used to fund overheads, to purchase equipment and to employ temporary staff.

The short term nature of these finances can lead to staff instability and an inability to develop medium to long term expertise within a division. However this has not generally been Mineral Engineering's experience.

Temporary staff tend to spend an average of three years at the Division, and in general both the individual and Division get 'good value from the term of employment.

An alternative approach to term appointments is for the collaborating company to second staff to the Division for the period of the collaboration. This has major advantages for both the Division and the people seconded. They bring with them the background knowledge of the company, a clear view of its position and directions, and practical skills in the area of the collaboration.

For the secondees, an appointment offers the chance to broaden their experience without losing the security offered by continuity of employment.

There are of course some pitfalls which may arise with secondments. These include problems such as divided loyalties and the difficulties raised by changed company circumstances such as management changes or even takeovers.

The high level of industrial collaboration in the Division's research does bring challenges as well as rewards. Project managers are being asked to perform a more demanding role than ever before, while all staff are having to learn to adjust to the changes being wrought by decreasing allocations of appropriation funding to the Division.

Mineral engineers at North Ryde

It may suprise many people to hear that there has been a small outpost of mineral engineers stationed at North Ryde since 1969.

The group was formed to carry out experimental research on various mineral processing techniques. Over the years a laboratory equipped with extensive facilities for both large technical-scale and laboratory-scale experiments has been established.

Since the group's early days, work has centred around the investigation of routes for the further processing of iron ores. The pelletising of ground iron ore fines was studied in a number of collaborative projects with Pilbara-based mining companies.

Several projects resulted in the development of techniques which resulted in large savings to the industry. Unfortunately these were not enough to avert plant closures resulting from the energy crisis and the subsequent downturn in iron and steel demand.

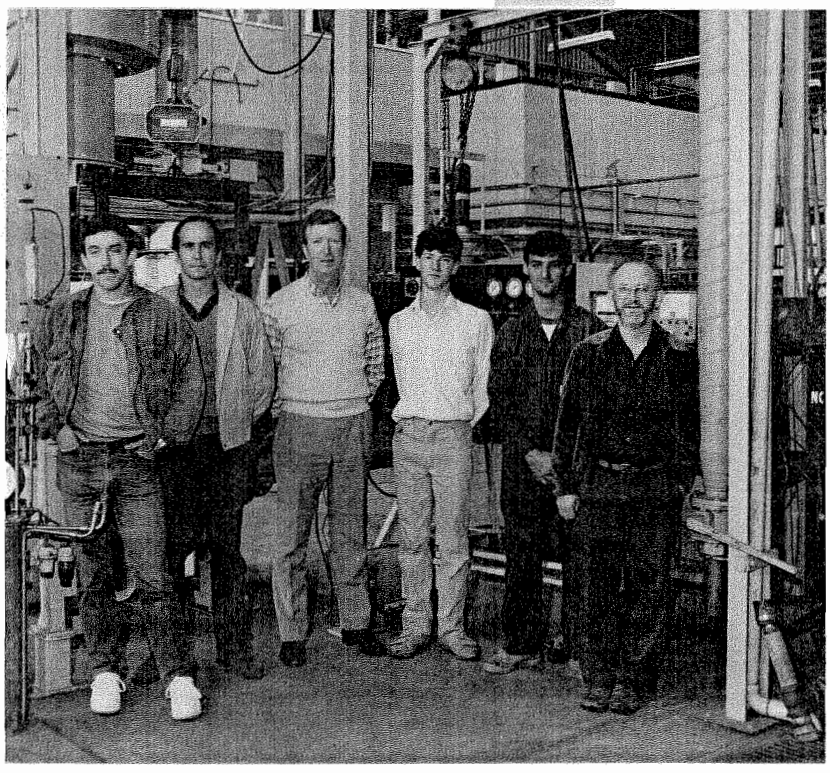
The 1980s has seen a significant move away from pelletising into research on the sintering of iron ore fines. Again in collaboration with industry and other CSIRO divisions, new programs were initiated, equipment designed and built and, using currently installed facilities, a modern efficient sinter research complex was set up. The facility is being used in conjunction with mathematical modelling to develop a fundamental understanding of the sintering process.

In addition, the relationship between the physical, chemical and mineralogical properties of ores and that of sinter produced from the ores is being studied.

The other major area of research at North Ryde is that of 'direct reduction' (DR), which is a process for producing iron from iron ores without smelting. In the early 1970s the processes studied were coal-based, but because of technical problems with those processes and the potential of cheap natural gas supplies to the Pilbara, the emphasis has shifted to gas-based systems. Currently, computer controlled experiments are being used to develop a much greater understanding of the DR process.

Extensive studies have been carried out and are continuing on the properties of Australian raw materials and their potential as feedstocks for DR processing.

The Mineral Engineering team at North Ryde, from left, John Michelmore, Rod Smyth, John Gannon, Ashley Miskelly, Russell Read and Tony Morrison (absent: Martin Young).



Nuclear instruments generating large industry savings

The development of nuclear instruments for the on-line analysis of ores and coal during mining and mineral processing operations by a team based at the Division of Mineral Engineering has led to the establishment of an Australian nucleonics industry supplying the world market.

Mineral and coal mining and processing operations can be controlled more economically if the characteristics of the ore or coal are well understood and if information on important process variables is obtainable rapidly. Much of this information can be provided by nuclear techniques.

Staff of the Division's Lucas Heights and Port Melbourne laboratories, who were transferred from the Division of Mineral Physics in July 1985, have been actively developing new nuclear techniques for the on-line analysis of coal and metalliferous ores in processing plants and at the borehole. Many of the instruments developed by the group have been commercialised, resulting in savings of millions of dollars to Australian and overseas mineral producers.

One of the group's early successes, which occurred before its transfer from the Australian Atomic Energy Commision to CSIRO, was the development of an in-stream system for analysis of metalliferous mineral slurries. Since 1972 Amdel, the AAEC licencee, has installed 36 of these systems in Australian and overseas concentrators. Its use in Australia is conservatively estimated to have increased the value of metalliferous minerals recovered by $15 million per year.

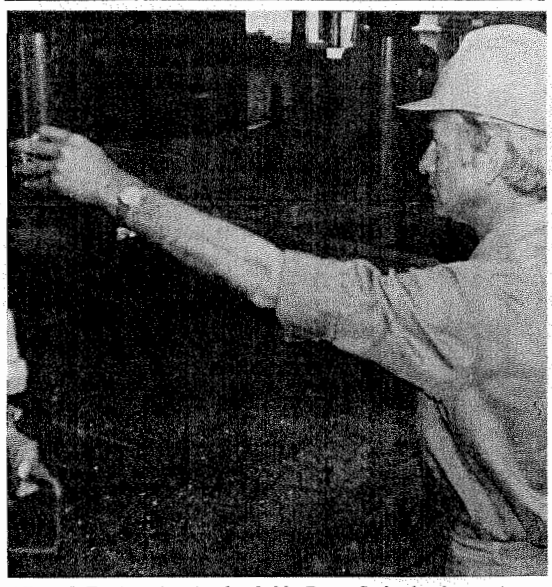
More recently two gauges, based on pair-production and low energy gamma ray transmission techniques, have been developed for the on-line determination of ash and moisture in coal on conveyors. These gauges are being marketed by Mineral Control Instrumentation of South Australia (MCI) under the COALSCAN trademark. As at April 1987, MCI has installed or have on order 37 of the gauges, valued at almost $6 million.

In 1984 the COALSCAN pair production gauge was awarded one of the prestigious United States IR*100 awards. It also won for its developer, Dr Brian Sowerby and his team, CSIRO's inaugural Sir Ian McLennan Achievement for Industry award.

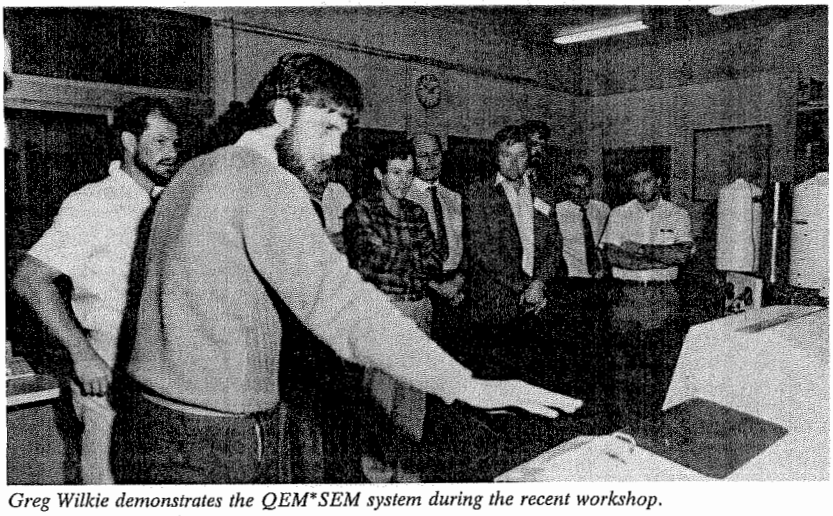
An instrument based on the pair production technique is also being developed for the continuous measurement of the iron content of iron ore on conveyors. At present a prototype analyser, which was developed in collaboration with Hamersley Iron Pty Ltd, is being evaluated on a ship-loading conveyor in the Pilbara. Initial tests show good agreement with analyses of samples taken by the sampling station.

Once its long term reliability is demonstrated on the ship-loading conveyor, the prototype will be tested on the very coarse ore output from a primary crusher. Such coarse ore can't be readily analysed by conventional means.

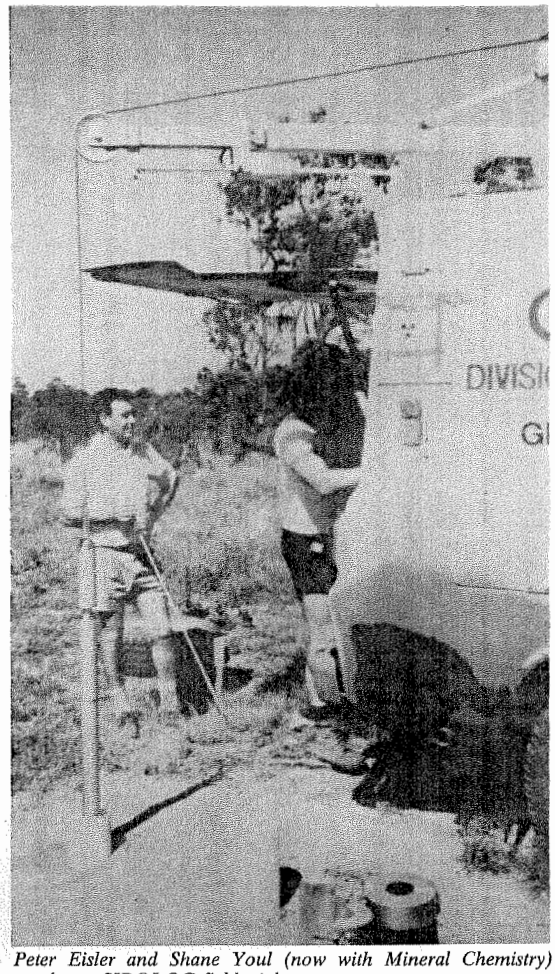
The application of nuclear techniques to borehole logging and borecore analysis has resulted in the development of a fully quantitative technology called SIROLOG. The system has principally been applied to the measurement of iron ore grade and the ash content of coal and has also been successfully tested for exploration and mine development applications. Geosource has recently been granted a non-exclusive licence to market the system.



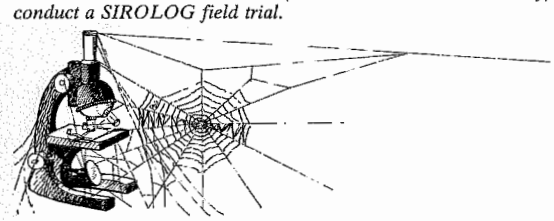
Mineral Engineering in the field: Dave Sutherland examines a flotation cell at Ardlethan Tin Ltd.



*Greg Wilkie demonstrates the QEM*SEM system during the recent workshop.*



Peter Eisler and Shane Youl (now with Mineral Chemistry) conduct a SIROLOG field trial.



Workshop raises awareness of QEM*SEM technology

Twenty representatives from 12 mining and mineral research organisations attended a workshop on the Division's QEM* SEM technology and bureau services on 23 and 24 February.

The workshop was held to provide industry with an overview of the technology, recent system enhancements and the application of QEM*SEM in the mineral industry.

QEM*SEM, which is an acronym for Quantitative Evaluation of Materials by Scanning Electron Microscopy, is a fully automated computer controlled instrument which can identify minerals and their features in ores sampled at any stage of a mineral processing operation. This unique instrument system can obtain mineralogical information at an accuracy which can't be matched by conventional mineral analysis techniques.

The development of QEM* SEM occurred over a seven year period with the support of eight major Australian mining companies

Originally designed to produce information on sulphide ore samples and concentrates, it is currently being used for the analysis of complex sulphide ores, tin ores, concentrated gold ores, heavy minerals from sediments and phosphate deposits. Research on adapting the system to the analysis of mineral matter in coal and the products of coal combustion is well advanced.

The technology is being made available to industry through the Division's mineral analysis bureau, called QEM* SEM Mineralogical Services. This bureau performs analyses for many of Australia's largest mineral processing companies and is fully self-supporting.

The success of the workshop has resulted in a decision to conduct QEM*SEM workshops annually.

Women in Science project

A group of women at the Division of Mineral Engineering have been keen participants in CSIRO's Women in Science project.

Their interest in the project led them to develop a short course which met with an enthusiastic response when recently piloted by the Collingwood Education Centre.

The Women in Science project aims to encourage schoolgirls in Year 10 to continue with maths and science subjects in Years 11 and 12. Sue Feteris, leader of the Division's team of volunteers, recognises the need for the program.

'Our visits to schools have convinced us of the importance of presenting girls with role models in the area of science. Many girls are unaware of the wide range of job options open to maths/science students,' she said.

Many possibilities

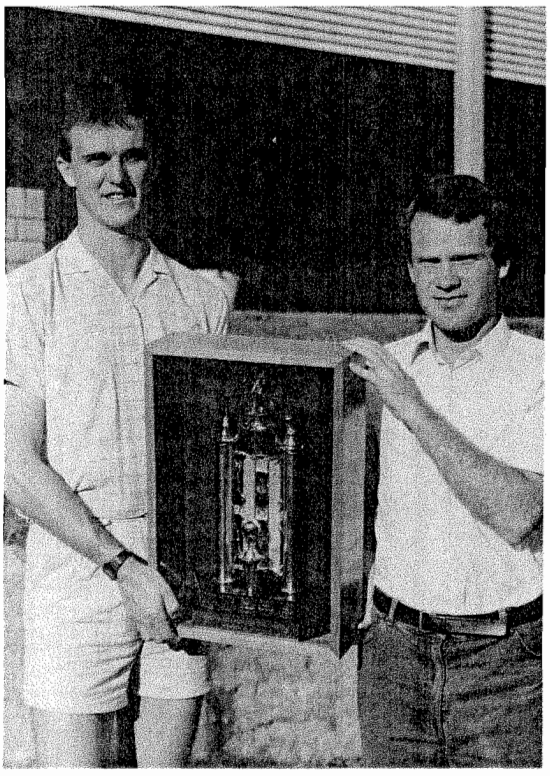
'The involvement of technical as well as scientific staff in the project has also helped to highlight the fact that there are many possibilities for interesting science jobs for those who do not wish to go on to tertiary studies.'

As a result of their experience with school visits, the group has initiated a program in which schools are offered the option of sending groups of students to the Division's laboratories. 'We feel that such excursions are much more exciting, and hopefully more memorable, to students than our visits to their classroom. We've certainly found that showing girls our work environment stimulates their interest in the sessions and makes it easier to convey a picture of the work we do. Most of the students have never seen a scientific laboratory or female scientist before.'

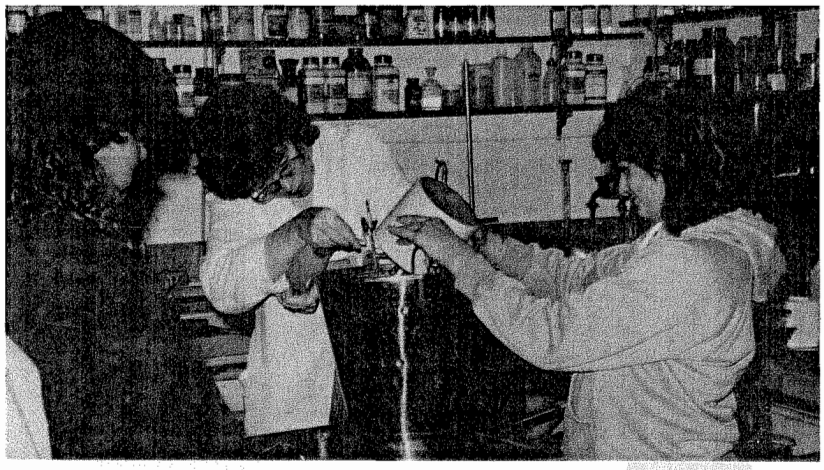
More recently the group has developed plans for a two lesson course which expands the preparation given to students prior to the school or laboratory visits. One of the major endeavors of the course is to make students more aware of the factors which influence their decisions concerning subject and career choices.

The course was recently piloted by a group of Year 10 girls from the Collingwood Education Centre. After spending two science periods working through the course, the group visited the Division on 9 April.

Judging from the interest shown in the demonstrations given by Leanne Smith, Jillian Grubb and Faye Seer, and the lively discussion led by Marion Dormer and Faye Seer, the response was very positive. Feedback from the science teacher who accompanied the girls on their visit also supported this view.



David Adernathy, left, and Michael Millen of Mineral Engineering, members of the 'Dynamos' team which won the 1986 Lucas Heights soccer competition. Michael was captain of the team.



Women in Science project: Leanne Smith and a willing assistant from the Collingwood Education Centre clean an ore sample from a ball mill.

Mineral engineers in the field: Keith Weller inspects the spirals of the gravity concentrator at Ardlethan Tin Ltd.

Mineral engineers in the field

The mention of field trips and travel opportunities at interviews for jobs at the Division has been known to bring a gleam to the eye of prospective employees. 'Exotic locations; large expense accounts; wine, women [or men] and song...'

It doesn't take long for new staff to realise that such dreams bear no resemblence to the reality of life in the field.

Field trips can last for as little as a few days to as long as several months. The destinations are often mineral processing plants and mines in remote parts of Australia, where the field party starts work at daybreak and finish at sunset.

Working conditions can vary considerably. For example, parties field testing nuclear instruments over the past few years have experienced temperatures of 48 degrees in the shade in the Pilbara, snow in Wyoming and knee-deep mud and pouring rain in New Zealand.

When equipment goes wrong in the field, the nearest hardware store turns out to be 100km away and the truck won't start. At such times the phone tends to ring in the dead of night, bringing news from home that the cat has gone missing or that junior has a bad case of 'flu.

Field trips form a vital component of the Division of Mineral Engineering's research program. They enable data to be gathered on mineral processing operations, techniques and instruments to be tested and developed in field and in-plant conditions, and also play an important role in technology transfer.

In addition, the contact with mining and mineral processing plant management and personnel in their own environment enables scientific staff to build up a realistic appreciation of the needs and priorities of the industry and the types of solutions that will be acceptable to it.

'Laser shine refining'

Letters from an enthusiastic inventor to some eminent politicians resulted in an unusual assignment for the Division.

There is a metal salvage yard in suburban Sydney where a 220 kVA 'Junker' carbon resistor furnace is installed. It was originally acquired as a salvage item, but over the years it has been used very successfully for melting and casting a variety of alloys such as stainless steel.

Getting more ambitious, the salvage man tried it for tin smelting of 300kg charges of high-grade casserite concentrates from North Queensland. Naturally enough it worked and gave a reasonable yield of tin. However, while the test was underway the salvage man and his very enthusiastic friends did two things.

Firstly, they observed the hot carbon rod through a pair of laminated dark-blue glasses and 'discovered' a non-existent red glow surrounding the rod. Secondly, they misread the power meters on the furnace and decided that the power consumed was one tenth of the actual consumption. Adding two and two, they came up with an answer between 10 and infinity, and 'invented' a new science and a new source of energy. They took out a patent which was granted by the Patents Office.

The new science-come-energy source centres on 'laser shine refining', and the generation of *Migma* in the furnace. The smelting reactants involved tricarbon monoxide as the reductant. All this was reported as a major breakthrough by an enthusiastic young journalist in the *Miner* newspaper (April 8-21 1985, p.9).

A sheaf of papers outlining the advantages to Australia of these new discoveries landed on the desk of the Minister for Industry, Technology & Commerce, Sen. Button, who referred it to the Division. The Chief undertook to monitor a tin-smelting run and report a full energy and material balance for the furnace. The results were compared with simulations generated from the Division's SMELT model.

Guess what? The test results coincided very closely with the energy and material balance predicted from the model.

Vale: another new science; another new energy source.

A Matter of Opinion

This month's point of view column comes from the officer-in-charge of the Wheat Research Unit, Dr Colin Wrigley.

It is gratifying to see CSIRO being much more effective in communicating with the Australian public in general, and with local users of CSIRO research.

But in concentrating on these audiences, we may still be too parochial in our communication strategy, with insufficient attention to the world beyond our shores.

Our planet is continuing to become 'smaller', with growing interdependence of one country upon another and with manufacturing efforts becoming international, involving multinational companies.

So often, the economic viability of potential products from CSIRO research depends on worldwide sales, not just the Australian market. We therefore need also to ensure that our commercial partners have the right connections overseas.

CSIRO's science continues to enjoy a good reputation internationally. This is basic. It provides a strong foundation that we must continue to build on by the presentation of good science in international journals and at major conferences overseas. An outward-looking view is also critical to an awareness of current world trends and advances, thereby ensuring that we overcome the problems of our geographic isolation.

CSIRO's involvement in the International Technology Exhibition in March was a further step in the direction of the worldwide audience. Participation in projects of ACIAR (the Australian Centre for International Agricultural Research) has brought many CSIRO scientists abruptly into the international scene.

Such activities have also brought accusations that our science and technology are being provided too readily, in ways that may even rebound on us to later harm Australia in international competition. Aid to needy nations is not incompatible with the later payment of royalties for successful exploitation.

Australia has too long been dependent on its primary products for overseas earnings. As we move into processing these products for export, let us remember the need for communication. Let us also be aware of opportunities for export in the tertiary sector —exporting education and our own research if the price is right.

How big is the community we serve?

Letters to the Editor

Cont. from p.2

for CSIRO to pander to the paranoia of any industry, especially when history may judge that industry severely? After all, who now thinks the Tasmanian Hydro-Electric Commission was correct over the Franklin Dam issue?

Peter Martin
Water Resources Research

(The article to which Mr Martin refers appeared in the Sydney Morning Herald *on 7 April this year)*

Dear Editor,

I have been encouraged to write to you by several CSIRO staff members concerning the Australian Federation of University Women which is currently contacting women graduates in the ACT.

Over the years there have been a number of graduates working for CSIRO who have become members and when moving interstate, they have linked up with that State association.

The ACT branch of AFUW aims to unite women graduates, further common interests, promote international understanding, encourage peaceful co-operation, further women's education and provide a network for those graduates resident in the ACT.

It awards annual prizes at the ANU and the CCAE and a bursary to an interstate research student.

Evening meetings are held on the first Thursday of the month in the Common Room at the ANU at 7.30pm. Luncheon meetings are held in June, July and August at the Robertson Room, St John's Church, Reid, at 12.30pm.

Information concerning AFUW may be obtained by phoning Dr Gwen Woodroofe, 95 6970, or by writing to AFUW-ANU, GPO Box 520, Canberra City, 2601.

Mrs Ruth Ross
President — AFUW-ACT

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Reef video

The Great Barrier Reef Marine Park Authority now produces a quarterly video (VHS) news magazine on its activities.

The video is available to anyone with an interest in the Authority's activities, and covers a number of projects.

Staff interested in receiving the programs should contact Ray Neale on 077-81 8811.

Cotton growers to benefit from re-engineered SIRATAC

One of Australia's most successful expert systems, SIRATAC, is being redeveloped to bring it up to date and make it more effective.

SIRATAC is a computer system which offers advice on pest management for cotton growers. The software was originally developed by the Division of Plant Industry, and has been in operation for more than 10 years. In this time it has firmly established itself in the industry as a management tool.

But the SIRATAC system has become more and more difficult to maintain, and every change prompted by new knowledge of pest management principles and practices has introduced further complexity into an already complex system.

At the end of 1985, the (then brand new) Division of Information Technology was approached by DPI, to redevelop SIRATAC using artificial intelligence technology. The task was taken on by a team led by Mr Bob Jansen in the software engineering group.

All parties will benefit from the project — DPI and the Australian cotton industry, who will get a better engineered SIRATAC, and DIT, whose scientists will gain valuable experience in engineering expert systems.

Completely redesigned

The project has proven to be more involved that first thought. It wasn't enough just to rewrite the system, it had to be completely redesigned. There have been several extensions to the estimated completion time, but the system should be delivered to DPI's cotton research station at Narrabri in August this year.

The new design will be more dependable, robust and flexible, allowing for future extension into a total farm management scheme with minimum change to the data structure, and a minimum of fuss when altering the existing characteristics of the scheme — eg. changes to chemical information or pest management principles.

Information Technology

Cont. from p.2

rundown reveals the scope of research now being energetically pursued.

Dr Trevor Hales is the leader of the Melbourne-based group researching computer networking.

The worldwide computer industry has grown in a rather haphazard way, so that now a number of computing 'cultures' exist without the means to easily exchange information.

As Dr Hales puts it, 'we are helping to break down the Tower of Babel'.

Dr Hales sees his group as acting as a link between industry and the academic/government research sphere, to improve the networking infrastructure and assist manufacturers and other users to exploit the opportunities afforded by internationally agreed standards for connecting computer systems.

The long term objective is to develop a communications environment where people in the information research or industry areas in Australia can easily and reliably communicate using electronic means with peers both in Australia and overseas. This would be a crucial breakthrough — 'knowledge is wealth' said Dr Hales.

Dr John Smith is leader of one of two programs in the centre for spatial information systems, headed by Dr O'Callaghan, which is based in Canberra.

The role of the centre is to carry out research into the design, implementation and application of computer-based systems for processing geographically and spatially referenced data. In plain English this means the research and development of methods of interpreting data from satellites and airborne surveys, or other forms used to determine how objects relate to each other.

This research will aim to benefit a range of applications including natural resource management, atmospheric and oceanographic research and mineral exploration.

Commercial agreements already have been established with Quentron Optics, the Dindima Group, Fujitsu Australia and Domain Computers.

A major project is now ready for commercialisation, and the centre is actively exploring further commercial involvement.

Mr Bob Colomb heads the software engineering and related hardware group. One of its major projects is the development, in conjunction with the Royal Melbourne Institute of Technology, of a data flow machine.

This involves 'parallel systems architecture', and this research forms about half of the group's activities.

'Parallelism' promises to deliver speeds hundreds of times faster than conventional computers — a formidable task. Attempts have been made to harness parallelism for many years.

The group is also involved in engineering expert systems, in particular at present upgrading the SIRATAC software (see separate story on this page).

Dr Graham Hellestrand heads the devices and systems hardware technology group. His group is working in collaboration with the joint microelectronics research centre at the University of NSW to build Australian expertise in the design and development of Very Large Scale Integrated (VLSI) circuits.

This group aims to provide a competitive design edge for products developed by Australian industry.

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Westpac Museum opening

CSIRO is the first guest exhibitor at the new Westpac Banking Museum in Sydney. Pictured at the opening are, left to right, Mr Trevor Clark, regional administrative officer, Dr Yvonne Esplin, NSW manager of the National Information Network, and Dr Paul Hewitt from the Division of Applied Physics.

Health matters

Smoking at work — still a burning issue

The CSIRO Occupational Health and Safety Committee will be giving consideration shortly to extending the current non-smoking arrangements (policy circular 85/37) in line with moves generally being introduced within the Australian Government employment sector. Movement towards a total ban in the workplace and in official vehicles is proposed with a likely start date of 1 March 1988.

The OHS unit would welcome views from staff on this issue as well as feedback on the success or otherwise of the existing policy provisions.

Safety officers receive boost

The management committee recently agreed that certain staff carrying out safety officer duties should receive a loading on their salary in recognition of the additional workload and responsibility involved in part time health and safety work. Policy circular 87/8 contains the details.

Georgia comes to town

The OHS unit was fortunate in being able to arrange for Dr David Taylor, director of the Office of Biosafety, Centres for Disease Control, Atlanta Georgia, to conduct seminars on health and safety for CSIRO staff. In Australia as a keynote speaker at the RACI Analytical Chemistry conference, Dr Taylor agreed to talk on the centres' extensive health and safety program.

Sessions at AAHL and IEER, North Ryde, attracted a number of divisional safety officers and other interested staff.

Central to the CDC program is the belief that 90 per cent of improvement in OH&S results from changes in attitude and behaviour while only 10 per cent results from improvements in facilities and equipment. Something for all of us to think about? Gary Knobel

A chapter closes at Fisherman's Bend

The completion of the Applied Organic Chemistry Laboratories at Clayton will mean the end of a chapter of CSIRO's history, as the Division leaves its Fisherman's Bend site.

In 1938, CSIRO leased 5.9 hectares of land at Fisherman's Bend from the Victorian Government for a period of 50 years. The site became the home of the Chemical Research Laboratories and the Division of Aeronautics, and a large area of the site was transferred to the Department of Supply. CSIRO retained 2.6ha of land.

A number of chemistry laboratories were built between 1941 and 1955, and the site soon became congested. The General Motors-Holden engine foundry was built on the east side of the CSIRO site and contributed to the high level of industrial pollution which hindered chemical research.

In the late 1950s Sir Ian Wark, then chairman of the Chemical Research Laboratories, began negotiations for CSIRO to acquire land adjacent to the north boundary of the new Monash University. CSIRO bought 15.4ha of land, known as the Clayton site, in January 1961 for $231 780.

Since the purchase of this site, laboratory complexes have been constructed at Clayton for four divisions, three of which were located at Fisherman's Bend. These were Chemical Physics, Chemical Engineering (now Mineral Engineering) and Chemical Technology. The Division of Mineral Chemistry moved from Fisherman's Bend in 1965 to a group of laboratories purchased from industry. The staff of the Division of Material Science, who were located at Fisherman's Bend, moved to Clayton in 1985-86 when their new laboratories were completed.

The only division of the Chemical Research Laboratories remaining is Applied Organic Chemistry.

A contract to build the Applied Organic Chemistry labs at Clayton was let in 1985 and the original completion date was expected to be mid 1987. However, for a variety of reasons, the completion date is now expected to be early next year. The cost of the project is approximately $13 million.

Officers of the buildings and property section have worked with the various divisions and with the Department of Housing and Construction which has managed the different building contracts. During recent years Messrs Russell Hicks, David Pincus and Gerry Smith have been the architects and engineers most responsible for CSIRO's involvement in the Clayton projects.

***CoResearch* is produced by the Public Communication Unit for CSIRO staff. Readers are invited to contribute or offer suggestions for articles. The deadline is the last Monday before the issue month. Editor: Liz Tynan, PO Box 225 Dickson ACT 2602. Ph: 48 4479.**

Gottschalk Medal to young CSIRO scientist

Division of Plant Industry ecologist and plant population geneticist, Dr Jeremy Burdon, has been awarded the 1987 Gottschalk Medal.

The medal is awarded by the Australian academy of Science to a young Australian scientist for distinguished research in medicine or biology.

Dr Burdon has pioneered work in Australia on the resistance of wild plant populations to parasites. His work on the wild relatives of valuable crop plants may reveal new ways to control costly fungal diseases.

It also shows the importance of conserving wild gene-pools for their potential applications to plant breeding and, ultimately, human welfare.

A team working with Dr Burdon has a funding proposal for developing resistance to rust in soybeans. If that is successful, genetic engineering, breeding and building up stocks could make a new resistant plant available in about 10 years.

This could have great economic significance in South East Asia, where soybean rust is already a major problem, and in the United States where enormous acreages of susceptible varieties are grown.

New animal federation officially launched

The Animal Welfare Federation of Australia was officially launched at a public forum in Sydney on 8 May.

The Federal Minister for Primary Industry, Mr Kerin, was scheduled to launch the Federation, which involves scientists, the National Farmers Federation and many other organisations involved with animals. Although CSIRO is not an official member, a number of trhe Organisation's scientists participate in their own right (*see CoResearch No. 294, August '86*).

Dr George Alexander of the Division of Animal Production, who initiated moves to set up the new body, is its president.

The Federation says its aims are to inform the community about society's interdependence on animals and to promote high standards of animal care.

For further information on the Federation, contact Dr Alexander on 02-631 8022.

Talented student sees science in action

Outstanding achievement in school science studies has earned one Canberra 16-year-old a trip to Sydney courtesy of CSIRO.

Craig Lawrie won the Australian School Science Competition last year, and also figured in the top five per cent of Australian science and mathematics students in this competition for the past three years.

When staff at the Institute of Energy and Earth Resources in Canberra read about Craig's achievements in the local paper they decided that such young potential should be rewarded, and a visit to CSIRO might help Craig decide on his choice of career.

As Craig has a particular interest in electronics and computing, the Institute offered to fly him to Sydney and organise an inspection of work that includes these skills in its divisions at Lucas Heights and North Ryde. With the help of Nancy Mills Reid of Energy Chemistry and Keith Chapman of Mineral Physics and Mineralogy, a two-day program was worked out for the visit in March.

The staff at Wanniassa High School were also keen to give Craig recognition for his outstanding work, and so a brief ceremony was arranged at the school on 25 March for all the senior science students. Guest of honour was none other than the Minister for Science, Mr Jones, who presented an air ticket to Craig and made a quick tour of the science classrooms. Dr Brian Embleton, Chief of Mineral Physics and Mineralogy, was the senior CSIRO representative present.

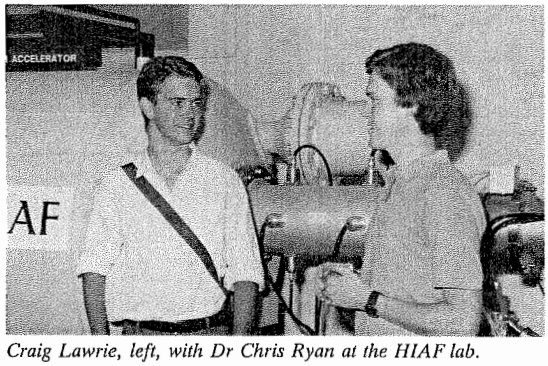
Next day in Sydney, Lucas Heights demonstrated how advanced computing is used to improve the provision of energy to the community. Energy Technology showed off its computer model of future energy scenarios and Mineral Engineering demonstrated its SIROGAS program for modelling gas flows in pipelines. Evidence of abilities in areas other than science was shown by Craig's drawing of a clown, using computer software.

Staff of the Australian Atomic Energy Commission also co-operated in this program, and Craig was given a tour of the HIFAR reactor, which should prove useful for next term's nuclear science topic.

When asked what he found most interesting and useful, Craig indicated a strong preference for the more practical aspects of science and technology he had seen, particularly technical drawing software and the use and maintenance of HIFAR.

Craig's second day was spent at North Ryde, where he saw some 'big science', such as the heavy ion accelerator facility and the remote sensing and data interpretation complex at Mineral Physics and Mineralogy.

His divisional escorts, Nancy and Keith, both think Craig has a rewarding future ahead of him, whatever he chooses to do. Despite the gloomy forecasts about a reducing pool of homegrown scientists, our schools are still producing students like Craig. The problem is many don't see science as an interesting or meaningful career; we can help demonstrate that it can be both.



Craig Lawrie, left, with Dr Chris Ryan at the HIAF lab.

Retirement

The Division of Applied Physics has farewelled a long-standing staff member who has seen many changes over the years. **Ms Betty Tevelein** has been personal secretary to many chiefs of the Division during her 43 years with the Organisation. She started work in 1944 as a secretary in the Division of Metrology, and later became secretary for Dr David Myers, Chief of the Division of Electrotechnology. After this, she became secretary to Fred Lehany who was in turn Chief of the divisions of Electrotechnology and Applied Physics and Director of the National Measurement Laboratory. In 1979-1980 she worked for Dr Bill Blevin who was then acting Chief, then for the present Chief, Dr John Lowke.

CoResearch

CSIRO's staff newspaper

No.303 June–July '87

May Economic Statement

Another cut — can we meet the challenge?

Aside from the planned reorganisation, CSIRO faces a big challenge in the months ahead, this time as the result of the Federal Government's May Economic Statement.

It must secure about 50 per cent more funding from industry for the 1987/88 financial year to compensate for appropriation cuts.

The mini-Budget has reduced CSIRO's allocation by $5 million in 1987/88 and $10 million in 1988/89. In addition, another $5 million has to be raised from the sale of assets.

In 1982/83 CSIRO received about $3 million from Australian industry for research projects. In 1986/87 the Organisation expects that figure to be around $11 million.

According to Headquarters' manager (budget) Mr Ian Farrar, a concerted effort will have to be made to bring in $5 million more outside funds in the next financial year.

'It will not be easy initially, but I believe there is scope for it to be done,' he said.

At present most industry funding comes from the minerals and the agricultural sectors, with not much from manufacturing. Moves to marshal more support from the manufacturing sector will be stepped up.

Decisions on which assets to sell were not made by the Economic Review Committee — it has been left to CSIRO to determine where the sacrifices have to be made. Several possibilities have been floated in the press (eg. sale of *R V Franklin*, or CSIRONET's supercomputer) but they are speculative — decisions have yet to be made.

Mr Farrar said work was underway to determine the feasibility of unloading certain property assets, and how much the Organisation would be likely to get for them. Institute directors are involved in identifying these assets. Final decisions need to be made very soon because of the long lead time associated with disposal of properties and the need to receive the cash during 1987/88 and 1988/89.

CSIRO has suffered cuts in the real level of Government funding in the past few years. However it's generally accepted that the Organisation has not been singled out for cuts (except in the disastrous 1984/85 Budget).

'While we cannot support any funding cuts in such an important area as research, CSIRO accepts that it has to share some of the burden of these difficult financial times,' said the Chief Executive Dr Keith Boardman in his response to the mini-Budget.

'CSIRO will market its research even more aggressively and more effort will be directed to projects under contract with individual companies on a full cost-recovery basis.

'But I would stress that research funding is an essential investment in the future of this country and it must be maintained,' said Dr Boardman.

Mr Farrar said 'one of the problems we've got is getting politicians and industry management to realise the importance of R&D. That's a very long haul.'

'A positive outcome of the successive tight Budgets is that we've been forced to aggressively pursue redeployment, to terminate lower priority programs. I don't think we have any *low* priority programs left. If there ever were any the cuts have weeded them out.

'It has made us sharpen the focus of our research effort,' he said.

One problem is that outside funds often come through rural industry research grants funded by the Government. Cuts in Government expenditure reduce the funds available to CSIRO from these sources.

'We are going to have to tap sources that we haven't tapped before, in addition to charging full cost recovery rates for contract research for particular companies,' said Mr Farrar.

'There has to be more attention paid to identifying the beneficiaries of our research, and to the question of whether those beneficiaries should be contributing more to the cost of undertaking that research.'

Greater effectiveness in tapping industry sources is expected to flow from the new institute structure soon to be implemented.

Cont. on p.10

Reorganisation

Time to have your say

Wide-ranging consultation with CSIRO staff on proposed changes to the structure of the Organisation is now underway.

At its meeting last month the CSIRO Board accepted the main thrust of proposals prepared by the management consultancy firm McKinsey and Co, in conjunction with institute directors and the Chief Executive Dr Keith Boardman.

The Board now wants further discussions throughout the Organisation about the details before it gives it further consideration.

The directors and Dr Boardman are between them planning to visit all divisions to get staff input on the reogranisation.

As they now stand, the proposals would replace the existing institute and division structures with an 'applications oriented' framework likely to comprise six institutes and 33 divisions.

The driving principle behind the proposed reforms is the need to better apply research results in the community, whether for the benefit of individual companies, sectors and/or the general public.

Assurances have been given by Dr Boardman and the directors that disruption to staff will be minimal. Rumours had been circulating that there would be a number of retrenchments and relocations, but apparently this will not be the case.

A plan for staff reductions in the regional administrative offices is already in place and this will go ahead independent of the proposed changes.

The reorganisation plan allows for considerable devolution of responsibilities to institutes and divisions.

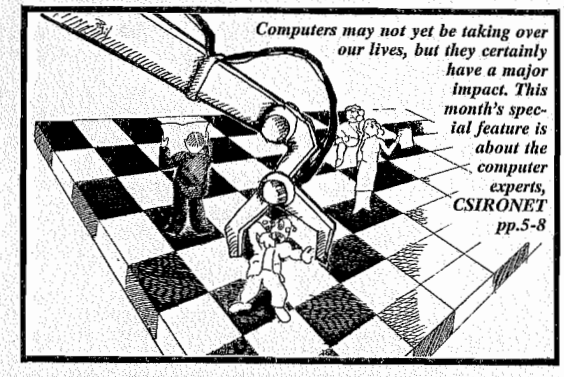
Dr Boardman said it was important to note that the potential changes, and especially the implementation of 'business systems', will not mean a swing away from excellence in research as many staff have feared since news of the reorganisation came through.

Rather, the object is to strive for the balance between world class research and applications orientation said Dr Boardman..

More details on the proposed reorganisation are on pp. 3 and 4.

Because of all the indecision surrounding when and how the McKinsey report is to be implemented by CSIRO, this issue of* CoResearch *is running very late. Apologies to readers, who we realise have been anxious to hear more about the proposals. Apologies also to letter writers and other contributors who have had to wait a long time to see their work in print.

Liz Tynan
Editor



Computers may not yet be taking over our lives, but they certainly have a major impact. This month's special feature is about the computer experts, CSIRONET *pp.5-8*

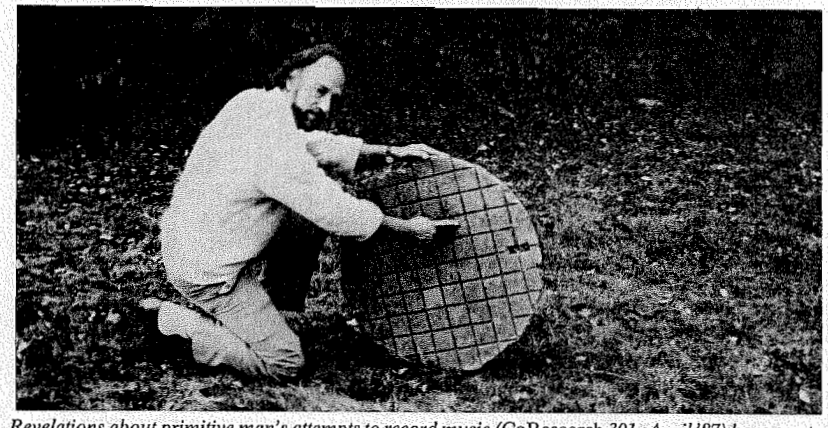


Photo: Philip Cleaver

*Revelations about primitive man's attempts to record music (*CoResearch *301, April '87) have created a stir in world scientific circles. Mr Paul Thomas from the Division of Forest Research has shocked insiders by dismissing the theory by a Swedish research group in favour of a radically different explanation for the mysterious stone disks. He is pictured here with an Australian version of the disk, which he says supports his view. His letter on the subject is on pp. 11 & 12 of this issue.*

From the Chief Executive

A column by Dr Keith Boardman

I consider that the outcome of the mini-budget discussions was reasonably satisfactory for CSIRO given the Government's determination this year to substantially reduce the deficit of the Federal Budget.

The Government on the advice of its Expenditure Review Committee decided that CSIRO should increase its external revenue, and the decision to reduce our appropriation by $5 million in 1987/88 and $10 million in 1988/89 was made on the basis of our own estimate that we could increase external funding by $11 million in 1987/88 with further increase in 1988/89.

The Minister, the Chairman and I argued that it would jeopardise the Organisation's ability to increase external funding and enhance its interactions with industry if our appropriation was reduced ahead of the receipt of the external funds. The decision to reduce our appropriation by $5 million was a compromise between no reduction and reduction in appropriation funds to the full amount of expected additional external funds.

We presented the view that the sale of underutilised assets was the best option for CSIRO if the Government was seeking a contribution from the CSIRO budget towards reducing the overall budget deficit. The option would not impact on the level of research activities. The Government decided that asset sales could be spread over two years to allow sufficient time to maximise the return to the Organisation: Revenue from the sale of assets in excess of $10 million over two years will be retained by CSIRO.

The Chairman argued strongly and successfully for no other reduction in CSIRO appropriation to allow the Board the flexibility it needed to re-order priorities for the Organisation so that CSIRO could made a maximum contribution to the economy and well-being of Australia.

In its response to the ASTEC report the Government acknowledged CSIRO's important role in longer term research. Contracts from industry should only form a proportion of CSIRO's funding, and the Government recognised its responsibility to maintain a national research effort which positioned Australia at the forefront of progress in scientific knowledge and fully competent to apply that knowledge for the benefit of the Australian economy.

There is no doubt that CSIRO should maintain its position as a leading research Organisation, nationally and internationally, but our scientists need to be more entepreneurial in perceiving the opportunities for successful application of their research, and be more willing to transfer their knowledge to industry and other users. But in the words of the Minister at the first meeting of the Board 'CSIRO must not merely be a superior panel beating shop' for the private sector.

(This column was written prior to the announcement of the election. I sincerely hope that the decisions of the mini-budget for CSIRO will be confirmed in the August budget with no further deterioration in our appropriation.)

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Culgoora turned on an ideal day and warm hospitality for the handing over to the Minister of the first antenna of the Australia Telescope by the Managing Director of the engineering and manufacturing company, Evans Deakin Industries of Brisbane. It was a pleasure to welcome Paul and Elaine Wild to the ceremony. They were making their first visit to Culgoora since the retirement dinner in September 1985, at which the Minister named the observatory at Culgoora the Paul Wild Observatory to honour Paul's outstanding contributions to radioastronomy.

K Keith Boardman

Possingham elected

The Chief of the Division of Horticultural Research, Dr John Possingham, has been elected federal president of the Australian Institute of Agricultural Science.

AIAS, a professional body of agricultural scientists in Australia, was formed in 1935.

Dr Possingham says the Institute, 'as never before, has a vital role in promoting agricultural science and appropriate technology for the benefit of agriculture in Australia.'

Letters to the Editor

No SDI research

Dear Editor,

There has been much debate about the wisdom of appointing a former politician as Chairman of CSIRO, but I for one am greatly encouraged by Mr Neville Wran's willingness to make forthright public statements such as 'CSIRO has nothing to gain and quite a bit to lose [in respect of participation in the US Strategic Defence Initiative]. The Government's policy is against Australia's participation in SDI and that is CSIRO's attitude as well'.

While there is every reason for believing that CSIRO will remain at the forefront of world research in such areas as space communications and laser technology, we *must not* accept funding for this research under the guise of the Strategic Defence Initiative.

I can only hope that a change in Government does not result in Mr Wran's dismissal.

Cyril Appleby
Division of Plant Industry

Closing programs

Dear Editor,

It was interesting to see Keith Boardman trying to come to grips with the matter of the distribution of research resources ('From the Chief Executive', *CoResearch* May '87).

He spoke of the value of a systematic approach to program evaluation as demonstrated by the McKinseys rare earth consultancy. Few would argue against the need for improved evaluation of a program before it begins. But this still begs the question of how you close programs down when they've already begun. That's where CSIRO management has come to grief over the past few years in its attempt to meet government demands for emphasis on research in support of manufacturing industry. It's been very good at boosting flavour of the month research and starting up attractive new programs but not so good at the other end of the planning spectrum — closing things down to pay for it.

Closing things down nearly always ends up at the doorstep ably find this an onerous task for which they need top man for which they need top management support in the form of workable mechanisms. As I understand it, these mechanisms are hard to find.

Small wonder, then, that CSIRO management appears somewhat divided, and that morale among chiefs and indians is pretty low.

What's needed? Many things, but high on the list is respected leadership based on vastly improved internal communication.

Wendy Parsons
Division of Forest Research

CSIRO translators

Dear Editor,

On reading the article in *CoResearch* No. 301 I was alarmed to see that yet another translator has apparently been lost. It is daunting enough to attempt to provide an efficient translation service with less than 50 per cent of the former staff (three translators instead of seven), and to learn that there is only one translator in Sydney causes deeper gloom and despondency. Where has the missing translator gone? Has he departed this world or this Organization (with a 'z', please)? Has he been transmogrified? Is he now serving in some remote Organizational gulag after confessing real or imagined transgressions to the KOB (a sort of poor man's KGB operating from Limestone Avenue)?

We are told that 'communication' (undefined but satisfactorily polysyllabic) is now the name of the game. This, however, must surely imply the communication of information the accuracy of which has been checked. In the present case there has apparently been no checking of facts. Certainly nobody has consulted translators.

But this is by no means unusual: it is normal, nay traditional, for authority or communicators either to seek information about the translation service elsewhere, or else to ignore translators completely, on the principle that the situation in which CSIRO translators at present find themselves cannot be used to support the thesis that all is for the best in this, the best of all possible Organizations (again with a 'z', please), which should, apparently, be the basis of all good reports.

There are two translators in Sydney and one in Melbourne. The translation service is part of the IRU and not, as stated in an earlier number of *CoResearch*, included in the Publishing and Printing Unit.

P Aukland
Translation service, IRU

(Editor's note: it is now official policy to use 's' in the word Organisation, not 'z'.)

International science

Dear Editor,

Over the past year or so the main thrust of *CoResearch* has been to present CSIRO as a vehicle for Australia's economic recovery, through a steady release of scientific inventions, which industry will turn into superb export products eagerly bought by a world hungry for our high technology. Any CSIRO employee (like Dr X) caught publicly pricking this balloon will not only have to contend with Group Y, but with Nifty himself (Nifty, as everyone knows, is the pseudonym of Doctor Who).

It is therefore very pleasing (or highly regrettable, depending on one's point of view) to learn (*CoResearch*, May '87) that international science aiming at the world at large (as opposed to national science as an economic weapon) is still alive (though probably not well) in the Organisation: the Gottschalk Medal went to a CSIRO scientist who is currently seeking (Australian?) funding to perfect a genetic engineering technique to make soybeans rust resistant, which, if successful, will enormously benefit South East Asia and the USA, but is apparently of no significance to Australia.

H A Haantjens
Broulee

Vanity Fair

Dear Editor,

Poor purblind Douglas Cocks (*CoResearch* No. 301), a vexillary of the old CSIRO. Had his vigilant mother opportunity to teach him more manners he would know better than to vilepend visiting firemen. Surprising is his failure to recognise that our world began rejecting Juvenal's prescription *vitam impendere vero* about the time he was born and that the vulgus now voguishly follows the precept *vox populi, vox Dei*. Its votaries pursue voodooism and trust in vatic powers.

Vespine comment on a vespiary devoted to vampirism avails nought, Douglas. So long as voluntarism prevails your verbalism is merely virga — raindrops evaporating before reaching the ground. I can understand that at your age you would not want to become a kind of *vivandiere*, but you could still vivify your life by appreciating the *vis comica* surrounding us all.

In the vastitude of your concern about vanguardism could you not sound a vamphorn on behalf of the velites in the BIPC which was featured in

Cont. on p.7

Wran calls for submissions from staff on proposals

The Chairman of CSIRO, Mr Wran, believes it's imperative that staff express their views on the major changes about to sweep the Organisation.

He said all divisions and groups in CSIRO were invited to make written submissions outlining their views to the Board, through him personally if they wished. These should be forwarded before the next Board meeting on 28 July.

Speaking in Sydney last week, he said 'scientists are our number one resource and we want them to participate effectively in the [reorganisation] process'.

The Board opened the door to staff input on the changes at its meeting on 16-17 June.

It's likely there will be a decision at this month's Board meeting on the next step in the process. But Mr Wran doesn't want to take that step until full consultation has taken place.

A key point he wanted to make was that 'good science' would not be sacrificed no matter what changes are finally put in place.

His goal for the future, he said, was to maintain CSIRO as a centre of scientific excellence, while translating the results of research to industrial and commercial purposes.

Management needed to be overhauled to achieve this, he said. It was essential that scientific managers at the divisional level had much more support and resources at their disposal, as well as a much clearer concept of the aims and profile of the Organisation.

'I don't pretend that CSIRO can produce a "snake oil" cure for the Australian economy. CSIRO can assist structural changes in the economy by the transfer of scientific achievement into new "brain" industries, as distinct from the old "brawn" industries, which in a time of economic crisis have been found wanting,' he said.

'There is not one person on the Board of CSIRO who wants to sacrifice one scintilla of excellence or in any way diminish the pursuit of strategic research,' he said.

'We will jealously guard the Organisation's role in that regard while at the same time bringing into sharper focus the transfer to industry of the results of research,' he said.

During his divisional visits in the past few weeks, Mr Wran has found that the most common concern among scientists is that the basic science capacity will diminish. He emphatically denies that this will be the case.

Part of the problem, he said, could stem from misinterpretation of the term 'business systems' — a name he doesn't like.

'I would like to hear people's views about this,' he said.

*Mr Wran said he he had been 'agreeably surprised' at the already existing relationship between scientists and industry.

'Those parts of industry which know of CSIRO's capacity make use of it,' he said. 'By raising the profile of CSIRO and lifting the curtain on its activities and achievements, more and more people in industry will understand how they can work with CSIRO.'

Mr Wran *Photo: Bob Campbell*

'There is not one person on the Board of CSIRO who wants to sacrifice one scintilla of excellence or in any way diminish the pursuit of strategic research...'

This interview was conducted with the Chief Executive, Dr Keith Boardman, on 24 June:

Q: What is the role now for McKinseys in the reorganisation of institute and division structures and functions. Has their part in the reorganisation now finished?
A: They are still involved with the institute prototype study [of the Institute of Energy and Earth Resources], and they are assisting in trying to determine what support systems are needed in institutes and divisions and the rational devolvement of activities from Headquarters. That study goes on until 3 July.

Q: Some staff have expressed concern about 'professional managers' being brought in to manage divisions and institutes. Will the new chiefs and directors also have strong scientific backgrounds?
A: I don't see any change in what we are looking for in chiefs and directors from the qualities we now seek. As we've been doing for the past few years, we will be looking for three things — scientific/technological reputation, management skills and the ability to promote the division outside the Organisation.

Q: What are the implications of the proposed changes for long term research with more intangible benefits?
A: There has been a misinterpretation about the fate of long term research. We must maintain a balance between the long term and the short term, between strategic and tactical, between appropriation funded and industry funded, and that will vary from institute to institute and from division to division. That balance is the responsibility of the chiefs.

Q: Would you agree that this period of consultation represents 'management by consensus'?
A: No. I don't think you can run any organisation by consensus. What is happening is consultation to give people an opportunity to express their view, to point out deficiencies and also make a contribution to how any proposals could be improved. Once all that consultation has taken place widely, the decisions will be made by management, or in this case by the Board. In general we should have more consultation on many management issues in the future, but always on the basis that the managers make the final decision.

Q: Some staff perceive that there has been a lot of backtracking about the detail of decisions (eg. reinstating the Division of Mathematics and Statistics) Is this so?
A: You can't have it both ways — firm proposals AND consultation. When you are at the stage of proposals and you enter into consultation it's likely there will be changes. It might be seen as backtracking, but it was based on arguments that were put up and an analysis of what we were trying to do. Certainly I acknowledge that the original proposal really wouldn't overcome problems with the way Maths and Stats sits in the Organisation and the relationship between the application of mathematics and its importance to industry and the community. To split Maths and Stats up into five groups wouldn't solve the problem that it has to relate to a number of business systems.

Q: How are we going to evaluate the success of the restructuring?
A: The success of CSIRO finally is based on the impact of our work on economic and social wellbeing. That is primarily how we will be assessed. Of course our outstanding reputation in science is important for our image, our morale and our wellbeing, but in the long term our success is gauged by the impact of our work on the Australian economy and the Australian people. McKinseys said it was no good just changing structures. We have to ensure that we do improve the effectiveness of the application of our research results. For that we are proposing that people employ proven project management skills and that we improve our evaluation of research, both prospective (in terms of how we select between competing projects) and also retrospectively so that we can assess broad areas and what the impact has been. We do see there will be a lot more evaluation retrospectively. We must ask if the nation is getting value for money. There's no doubt that even though we haven't done these evaluations, it's generally recognised that our impact on rural production in Australia has repaid the investment many times over. It's believed that our contribution to the mining and minerals industry has also paid back the cost of research. We need in the future to do that across all the sectors retrospectively. The point is to establish that the benefit to the community of our work far outweighs the contribution from the tax payer. That has to take account of the 'social benefits', that is, environment issues, pollution, soil erosion and maintenance of particular areas like tropical rainforests. That benefit has to be assessed, even though the benefit is even more intangible, but can still be given a value.

Q: What is the timetable for implementation of the proposals?
A: As the Board said in its statement, and as McKinseys has said, the whole thing needs to be managed as a project. The first thing in any timetable is to agree to procedures and to appoint directors and chiefs. As far as the support structures go, they will take longer to put in place and there will have to be an implementation group. It will be brought in over months, but the important things have to be done fairly quickly.

Q: Do you think the majority of staff are on side?
A: I think when it's explained to them they are. Certainly the Officers Association and the Technical Association are on side with the general principles. I think the problem has been the term 'business systems' being misinterpreted. It is a management term whereby you link science and technology with its application for economic or social benefit. We're saying a structure along these lines would make it easier to get that linkage. I believe the world is changing significantly. When you go to some of the top universities in the United States like Stanford, you see that the scientists have become very skilled at being able to achieve both outstanding scientific reputations up to the Nobel Prize level, and they also earn considerable amounts of money from the spinoffs from their basic research. They're getting the best of both worlds. It can be done.

Q: How are you keeping in contact with the attitudes and reactions throughout the Organisation?
A: I'm going to travel around quite a bit. I have been bogged down at Headquarters for the past month, and now it's very important that I move around. I'm planning to go to at least Perth, Adelaide, Brisbane, Townsville, Atherton and some divisions in Sydney and Melbourne. I will talk about my general aspirations for the reorganisation and the importance I see in the Organisation being more effective in the future. I'll be mainly explaining the proposals at this stage, but I will also try to set the scene about what's expected of the Organisation and what may be the likely budgets and the ability to earn funds from outside.

Q: Are the names for the new institutes and divisions final? For instance, is the name 'National Interest' appropriate for an institute?
A: If people want to put up suggestions, they may. None of the institute names are finalised and if we can have better names we will consider them. That's true of all the division names too. There won't be any decisions made unilaterally.

Q: Is it likely that institute headquarters will be decentralised?
A: Yes, quite likely. It looks like all directors will not be centralised in Canberra and an institute headquarters will probably go with the director. I can't give any idea yet where the distribution will be, but I would think Canberra, Sydney and Melbourne will be the three centres. The benefit of decentralising is that the institutes would be closer, firstly, to their customers, and also to the divisions. Since 80 per cent of a director's time is devoted to running his institute and interacting with the customers, the corporate role is only a small part of the total. Although that's important and they will have to have offices in Canberra and be here together for certain periods, one does see that the main work is going to be out there, not Canberra.

The reorganisation

'The task has just begun...'

It's happening to the ABC, the Australian union movement and many companies and government bodies around the world — in a word, restructuring.

A number of foreign government scientific agencies, such as those in England, France and the United States, have already been through the changes needed to equip them for the next century. Now it's CSIRO's turn.

Management consulting heavyweight, McKinsey and Co was selected to examine CSIRO management and consult with senior managers on CSIRO structures.

McKinsey's services do not come cheap, but CSIRO Chief Executive Dr Keith Boardman, while declining to say how much the exercise will cost, said 'whatever it costs us, it will be cheap in the long run'.

'It's a miniscule cost compared with what might happen as a result of it,' he said, referring to the expected boost given to the Australian economy with the successful implementation their proposals.

The proposals include the restructuring of institutes and divisions along 'business system' lines, which it's believed will assist in the selection of research priorities with clear strategic goals and introduce a more effective linkage between research results and their implementation for commercial and social benefits.

The proposals also include a streamlining of administration with greater devolution to institutes and divisions.

McKinsey recommended that the CSIRO management system be completely overhauled and that new job descriptions be formulated to clarify responsibilities from the Chief Executive down.

Institute directors were involved in formulating the proposals which went to the Board last month and which are now up for discussion.

As the directors point out, the job has really only just begun.

A 'test run' is now being conducted on the Institute of Energy and Earth Resources. It will be used as a model study to see how a particular institute will adapt the system. The object is to determine what support this institute requires in terms of personnel, finance, planning, communication and human resources in order for the business systems approach to take effect.

All directors endorse the business system approach recommended by McKinsey, saying it will bring the Organisation closer to the community it serves, and will also contribute to the development of a greater sense of purpose among employees.

In most cases, the new divisions will contribute to more than one business system, although there are some examples where one division will work to just one business system (eg. Fisheries).

A number of business systems have been proposed, but the list is yet to be finalised.

The directors said a key component of the proposal was to foster long term research of the kind likely to lead to new industry opportunities.

The accent is not just on designing business systems to cater for existing industry, but also on pursuing the research which may open new possibilities.

Perhaps the best example of this is the recommendation to establish a new Division of Biotechnology.

It's hoped that this will be the origin of an Australian pharmaceutical industry. A wide range of possible products would be pursued, such as genetically engineered animal vaccines, human health products and farm protection products.

The division is likely to comprise the biotechnology elements of the current divisions of Protein Chemistry, Molecular Biology and Chemical and Wood Technology.

A relatively straightforward example of a business system is the one proposed for wool.

This would function under the proposed new Institute of Animal Products. In this system, a number of divisions would contribute at various stages, starting with Soils, right through to those involved in physiology, wool processing and ultimately textiles.

The directors say the proposals have been worked out in such as way as to cause minimal disruption to staff.

The acting Director of the Institute of Industrial Technology, Dr Warren Hewertson, said 'this has been a major criterion of all our work. We do not want to move people all over the place and make nice tidy clean boxes on a piece of paper.

'We have attempted to leave people where they are and reorganise management around them,' he said. 'We don't want the disruption of moving staff and their families unless it is absolutely essential. The vast majority of people will stay where they are.'

Part one of the reorganisation process has focused principally on the proposed new research structure, especially implementation of the business system concept. The second stage will involve an administrative systems review of the functions and roles that will be fulfilled at corporate, institute and divisional level.

The administrative details of the plan will be proposed by a special project team.

It's likely that the new set-up will also have provision for the appointment of a corporate services manager. The purpose of this would be to reduce the number of people reporting direct to Dr Boardman.

This would help free him to concentrate much more on research policy and his role as a 'corporate statesman' rather than administrative detail.

Communication

The communication task force set up to inform staff about the proposed changes already has had a number of enquiries.

Task force chairman Dr Max Whitten (Chief of the Division of Entomology) said he had spoken mainly to scientist who have expressed concern about whether the changes will threaten the pursuit of 'good research' and swing the Organisation towards the tactical end of the spectrum.

He said he had sought to reassure people that long term research would still be carried out. Research in the national interest, while not necessarily having potential large financial returns, was vital to Australia, he said.

'We've found that most concerns about the implementation of the McKinsey proposals can be put to rest by talking to people and supplying further information,' he said.

All staff members are invited to contact members of the task force if they have any queries.

The members are:

Fran Geermans, SSO, Building Research 03-556 2211
Ian Harvey, SPRS, Applied Physics Sydney 02-467 6211
Don Berrie, STO, Tropical Animal Science Bris. 07-377 0711
Lindsay Bevege, public affairs officer Canberra 062-48 4684
John Brophy, regional admin officer Perth 09-322 2111
Carmel Macpherson, EEO officer Canberra 062-48 4328
Max Whitten, Chief, Entomology Canberra 062-46 4911
Doug Howick, ind. liaison officer C&WT Melb. 03-542 2244
Ruth Brooks, assistant to Chief MP&M Sydney 02-887 8666
Paul Stone, STO, Soils, Adelaide 08-274 9308

CHRONOLOGY OF EVENTS

February: CSIRO Board meeting agrees that CSIRO engage consultants to advise on upper management.
16 April: McKinseys outlines 'business system' approach to management committee. Propose fundamental rethink of research strategy and consequent structural reorganisation.
18-29 May: Two week workshop involving the Chief Executive, institute directors and McKinseys to identify appropriate business systems structures and develop proposals for new institutes and divisions.
24 May: Communication task force (CTF) set up.
27 May: Directors meet with chiefs to outline proposed structures and reasoning behind the reorganisation
28-29 May: Chiefs outline proposals to staff and meetings held in RAOs, BIPC in Melbourne and Headquarters. Chief Executive meets staff associations to outline proposed changes and thinking behind them.
2 June: Meeting to identify the major issues concerning management and administrative structures in the proposed model institute study.
5 June: Second meeting of the Chief Executive, directors and unions to discuss progress and exchange views.
11 June: CTF's Update 1 released.
16-17 June: Chief Executive and McKinseys present proposals to CSIRO Board meeting in Hobart.
18 June: Chief Executive advises directors and CTF on the response of the CSIRO Board.
21 June: Press release from Chairman distributed to media.
22 June: Message to staff from Board. Progress report on model institute study to directors and staff associations.
23 June: Meetings of directors and CTF to plan preparations for 28 July Board meeting.
26 June: Dr Boardman's statement to staff. Update 2 and Forum 1 issued.
3 July: Model institute final report completed.
13 July: Meeting of all chiefs at HQ to discuss draft recommendations of model institute study with Dr Reid.
14 July: Meeting of unions at HQ to discuss draft recommendations of model institute study with Dr Reid.
15 July: Directors meeting to discuss unresolved issues.
20 July: Discussion at Clayton of model institute study between interested staff and study team.
21 July: Discussion at Lindfield of model institute study between interested staff and the study team.
28 July: Board considers the proposed reorganisation at its meeting.
29 July: Unions and staff to provide final comments on model institute study.

Some responses

Space constraints did not allow* CoResearch *to run comments from all chiefs about the proposed restructuring, so we have endeavoured to present a cross-section of responses. All staff members are invited to put forward their own views for publication in the next issue.

Many chiefs strongly support the McKinsey recommendations but others are concerned about the impact of some of the possible changes on their divisions.

The Chief-elect of the Division of Mathematics and Statistics, **Dr Peter Diggle**, said that although it was now proposed to retain the Division there were still problems to be overcome.

'The proposal is now that the Division should recover 30 per cent of its appropriation from the divisions it works for,' he said.

'We see serious problems in making that system work in a sensible way. It is open to a number of interpretations and it is not clear to us that it will work well.'

'We are now trying to get the proposal modified through negotiations with the institute directors.'

Other Chiefs were more enthusiastic about the McKinsey proposals.

The Chief of the Division of Textile Physics, **Dr Ken Whiteley**, said: 'I am very strongly supportive of the

Cont. on p.9

Commercialisation

Taking out the red tape to boost customer service

Increasing pressure is being placed on divisions in CSIRO to work on more collaborative projects with industry, commercialise products where a market is seen and generally become more responsive to market realities.

This new thrust is reflected in the changes now going on in CSIRONET, the independent computing arm of CSIRO.

Following a review of the Division of Computing Research in 1982-83, the CSIRO Executive decided to separate CSIRONET from the Division and establish it as an independent agency.

CSIRONET was charged with operating the already extensive computer network and providing general purpose and scientific computing facilities and services to CSIRO, government departments and other external users.

In January 1985 the Division of Computing Research was dissolved and CSIRONET became an independent agency with its own board of management. It was directed by the Executive to become more commercially oriented and actively market its services throughout Austalia. Towards this end, negotiations are now underway with external organisations regarding the formation of a new organisation that will be fully commercial.

But why is CSIRONET becoming a commercial organisation rather than staying as a division primarily interested in strategic research with an associated services role? It comes down to wanting to provide good quality service to customers.

To provide high quality computing services to clients spread throughout Australia and be able to respond quickly and efficiently to changing demands, an organisation must have an effective administrative structure. The Corporate structure should assist rather than inhibit managers and give them the opportunity to make decisions with a minimum of bureaucratic restriction. There are real difficulties operating a commercial organisation under public service regulations.

In the rapidly changing information technology industry the window of opportunity for a product is often very short. If an organisation is going to profit from an exciting development it needs to move quickly before a competitor captures that market.

In addition it is important that any development work undertaken by an organisation is directed towards improving services to customers. After all they are the ones who pay for the salaries of staff and costs associated with running the operation.

When CSIRONET was part of the Division of Computing Research there were often conflicting demands between running a service organisation and conducting important research that may not result immediately in improved customer service.

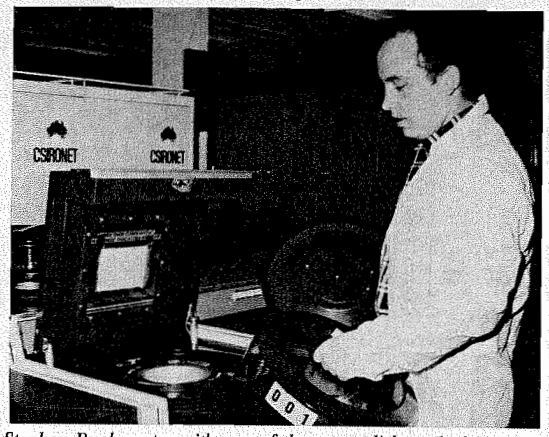
With the splitting of the Division into two components, CSIRONET and the Division of Information Technology, CSIRONET can now concentrate on serving its customers in the best way possible.

Recent developments that have been designed to help customers have included the appointment of account managers, establishment of a 'help desk' to channel and follow up all requests for assistance from customers and the moving of many of the testing and maintenance periods outside prime time.

And it has further implications. CSIRONET research and development work concentrates on improving services to customers: small 'r' and big 'D' if you like.

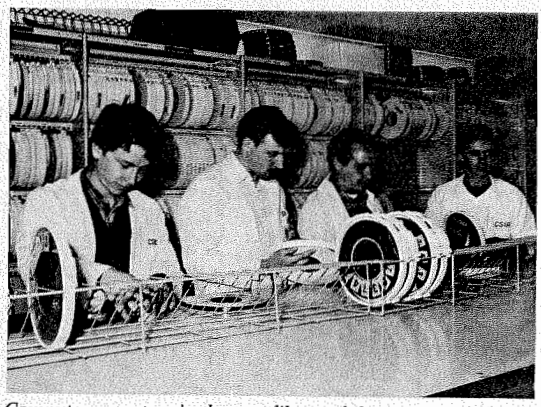
As new products come onto the market that are believed likely to improve the quality of range of services these are integrated into the CSIRONET environment. If suitable products are not available then CSIRONET endeavours to develop its own.

Basic and strategic research, vitally important to Australia's competitiveness in the information technology industry, can now be given the attention it deserves by researchers unfettered by the demands of responding to customer queries.



Stephen Buckmaster with one of the many disk packs located in the CSIRONET computer halls. *Photo: Allan Edward*

Computer operator Boz Agrali *Photo: Allan Edward*



Computer operators in the tape library, left to right, Boz Agrali, Graham Hemsworth, Stephen Buckmaster and Brian Morris. *Photo: Allan Edward*

Survey used to plan advertising push

Before embarking on its latest advertising campaign designed to increase business with non-CSIRO enterprises in the private and public sectors (see story below), CSIRONET commissioned a survey.

This was carried out by a private firm, The Research Department, and revealed a mixed knowledge of and response to CSIRONET and its services.

The study found there was low awareness and knowledge of computer bureau services. However, CSIRONET scored well among those familiar with it, with the greatest number of 'good' ratings out of the six computer bureaux listed.

The strongest support for CSIRONET was found to be in the 'federal' sample group.

Comments varied from very favourable to critical, including: 'easy to get on with', 'good, aggressive publicity' and 'public service mentality'.

Part of the survey examined whether respondents thought it was an advantage or disadvantage to be associated with CSIRO. The results were:

	DP professional %	non DP professional %
Advantage	55	45
Disadvantage	--	15
Don't Know	45	40

Advertising campaign paying off

Initial responses to the advertising campaign started in December 1986 (described in the February issue of *CoResearch*) indicate it is improving awareness of CSIRONET among potential customers.

In April and May two new advertisements were introduced, one describing how the retail clothing store Sussans is using CSIRONET for inventory control and the second looking at how engineering firm Econsult is successfully using CSIRONET for linear programming in the coal export industry.

Both of these advertisements will be run until the end of August in *The Australian, the Financial Review, Computerworld* and *Computing Australia*. At this time an evaluation of the campaign will be made and further activities planned.

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This feature is designed to present a cross-section of activities at CSIRONET and is not intended as a directory to all services. Call Ms Sue O'Connor on 062-43 3299 for more information.

Next month we will have a feature on the Division of Animal Health.

Network Automation nets some big contracts

Network Automation, a joint venture company established in February this year between CSIRONET (40 per cent) and Techway Ltd (60 per cent) has already won a $3.4 million contract for the supply of 84 network nodes to the State Rail Authority of New South Wales. It is also negotiating sales with overseas customers.

Network Automation will be designing, developing and marketing systems for the international market.

The cornerstone of its plan to capture about 10 per cent of the $1 billion computer communications market by 1990 is the 'ultranode'. There are currently 200 ultranodes installed on the CSIRONET Australia-wide network.

The hardware was developed jointly by CSIRONET and Network Research (a member of the Techway group of companies). The software was developed by CSIRONET staff.

Network Automation, which has six field officers in the United States promoting the product, has also set its sights on Europe and Asia.

It is now proceeding with a distribution agreeement covering Hong Kong and the People's Republic of China, which has been secured by its parent companies Techway and CSIRONET.

Its Hong Kong affiliate, Four Seas Telecom, is co-ordinating a series of seminars in China.

These international and local developments, together with a $4.8 million contract won last September by CSIRONET for the data communications component of the $20 million South Australia Justice information System (JIS), testify to the earnings potential of the product.

The ultranode can link mainframes and mini-computers as well as personal computers across areas as vast as Australia or across oceans. There are few products with its power and versatility on the world market today.

Headquarters is a major CSIRONET customer

Did you know that every time you open your pay packet, CSIRONET has been of service to you?

The entire payroll and personnel system is stored and calculated on CSIRONET and managed by headquarters' finance and administration staff. Other administrative activities run on CSIRONET are accounts payable and receivable, fixed assets and projects systems and variety of *ad hoc* tasks.

Mr Greg Batchelor, CSIRO manager finance and administration, said the Organisation had been using CSIRONET for its administrative computing since the early 70s. In that time he had seen a change in the quality of service offered.

'In the past there has not always been a particularly good relationship between CSIRO and CSIRONET. However it is fair to say that over the past 12 to 18 months, with the move to commercialisation, there has been the recognition by CSIRONET that it must help and support its customers,' he said.

'It's obvious that there has been an improvement in the service now provided by CSIRONET.'

He said there had been an improvement in the communication between the two groups and a commitment from both sides to make it work.

A far-flung organisation like CSIRO needs a computer system with an Australia-wide network that can be accessed from all its major offices.

The RAOs do the preparatory work and act as the paying arms for CSIRO headquarters. They are connected to CSIRONET via NGEN micro-computers and telex terminals.

Headquarters is working on an integrated computing support system via personal computers in the RAOs. The system is gradually evolving with the placement of micro-computers in these offices while retaining the mainframe capabilities in a central location.

There are 25 systems support staff in headquarters who support the applications run on CSIRONET, modify and write software and generally maintain the system from CSIRO's point of view.

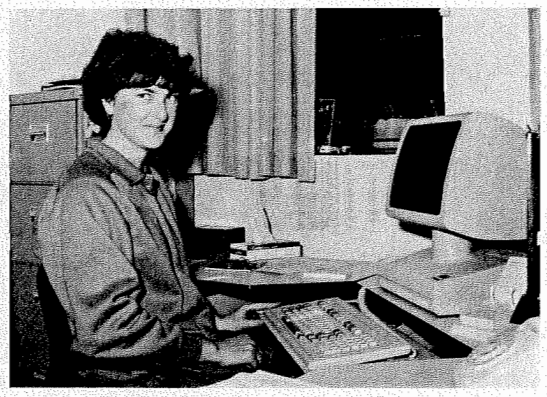
Currently most of the applications are running on CSIRONET's Facom M380 with some still operating on the Control Data 845.

However, in July all systems will be transferred across to the Facom M380 and the Walker general ledger package installed. This will be a major step in CSIRO's move to fully integrated, online integrative administrative support systems.

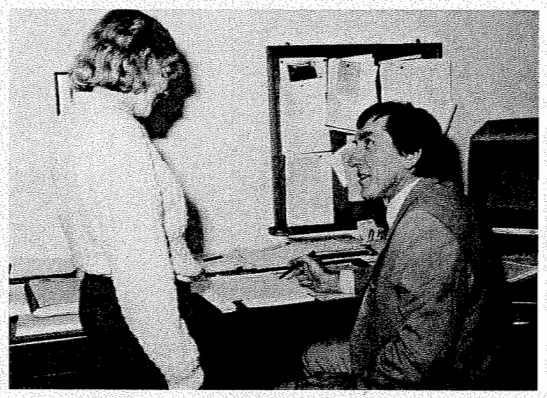
CSIRO has a three year agreement with CSIRONET to provide computing services. This agreement is in its first year of operation.

Frank McKean, standing, with Terry O'Mahony, Janelle Ford and Mark Hardwick (see story, right).

Photo: Philip Cleaver



Karen Brandt, secretary to Martin Smith who is the general manager, finance and administration.



Fred Vezis, general manager, services and products, with secretary Silja Metso. *Photos: Allan Edward*

###

New account managers Taking care of business

Over recent months, CSIRONET customers may have noticed a new personal touch when sorting out queries and finding solutions to problems. The source of this on-the-spot assistance is the new account manager service.

Account managers carry a major responsibility for meeting the needs of clients. They require a broad skills base, need to enjoy working directly with a wide range of people and be sound solution providers. For many clients, contact with their account manager will be their primary contact with the organisation.

The CSIRONET account management force now has grown to 10 with new account managers in Canberra (Mr Frank McKean) and Melbourne (Mr Norman McMurtie).

Problem solving, the provision of marketing and technical expertise, technical support and planning, on-site management, project management, pre- and post-sales support, education and training are some of their day-to-day activities.

'Advising clients on cost effective solutions to problems' is the way Mr McKean describes his task as account manager for Canberra.

He supports Headquarters and the RAO, as well as handling major Commonwealth Government accounts. Previous experience as a Commonwealth employee in agencies with extensive computing facilities has given Mr McKean the necessary understanding of the sorts of problems managers of public enterprises face.

Working with CSIRONET, though, requires technical expertise in several different computer operating environments, an ability to define a client's needs in the client's terms and translate those needs into a technical specification.

When asked what kinds of problems his clients face, Mr McKean said 'the provision of additional services, the solving of *ad hoc* processing/production problems and the provision of costed solutions to meet the goals set by corporate planning and the resource capacity available.'

'An account manager needs technical expertise right across the spectrum, operations, hardware, systems and software,' he said. He has found as account manager that customers expect the CSIRONET field representatives to have the necessary expertise to deliver solutions when problems arise.

National Film & Sound Archive keeps track of holdings on CSIRONET

Where would you go to get footage of the Sydney Harbour Bridge in the 1930s, the opening ceremony of the 1956 Olympic Games in Melbourne or the 1896 Melbourne Cup? The National Film and Sound Archive in Canberra. And information on their holdings of film and television footage is stored on CSIRONET.

Mr David Watson, officer-in-charge of film and television catologuing and access explained that information about the film and television collection stored using (film, location and information control systems (FLICS), a system written in Adabas/Natural. 'Until April 1984, we were part of the National Library of Australia. When we became a separate organisation we still continued to use their Facom M200 for FLICS,' he said. 'In March we transferred to CSIRONET.'

Currently FLICS contains information on 13 000 film and television titles. At the moment they are loading all manual holdings (approximately 30 000 records) onto magnetic tape. These are being key punched in Singapore and it is expected that the completed tapes will be returned and loaded in June this year.

Fragile collection

The balance of the archive is the valuable but fragile nitrate film collection. This is currently being tested for stability etc and entered online in Canberra under a Community Employment Scheme. It is hoped that by July the entire collection, in excess of 40 000 items, will be stored online. 'It is really quite rare for film archives to be entirely storied on computer,' said and obviously proud David.

FLICS is accessed using Convergent Technologies NGEN microcomputers via a direct 9600 baud line to CSIRONET (a distance of less than 2 km). FLICS is mounted on CSIRONET's Facom M380. At the moment online access is available only to their Canberra office but they hope to give their Melbourne and Sydney offices access in the near future. The lack of terminals in these offices is the main drawback.

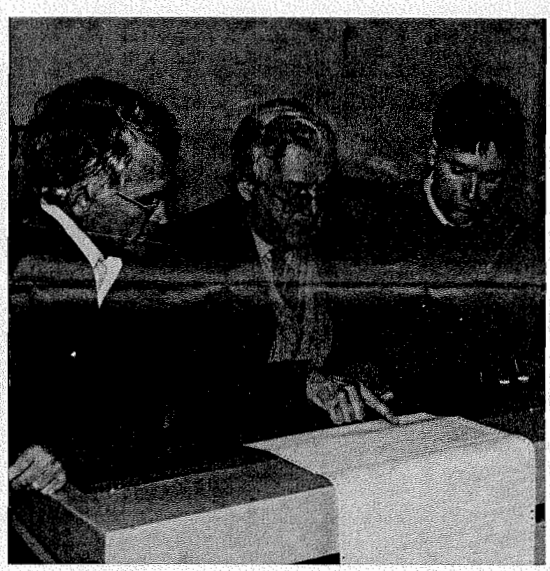
'FLICS helps us to pinpoint the location of all our titles in our seven storage sites in Canberra and two in Sydney,' said David. 'It also helps us to keep track of what titles have been loaned, moved around or sent to film laboratories for preservation.' This system also automatically receipts new material received and produces sticky labels for the film cans.

On average, the Archive makes around 5000 new acquisitions each year and all of these must be entered into FLICS. Initially only the barest of details about the acquisition are entered but later more details, such as a precis of the film and whether it is in black and white etc are entered.

Since transferring onto CSIRONET, David has noticed a dramatic improvement in the service. 'The response time has been much faster and it's good to have 24 hour access to the database. We can now employ people to work out of hours to enter or modify data,' he said.

"We now have local printing, something that we didn't have when we were on the National Library computer. On the whole it's been like a breath of fresh air.'

A consultant is currently installing Supernatural on the system. When this is complete, staff will be able to generate *ad hoc* reports, for example, a list of all overseas feature films held. Depending on demand, the Archive hopes to be able to provide public access to the database so that film production houses and large television studios will be able to search the database directly themselves.



From left to right, Dr Tom Spurling, Dr Charles Johnson and Mr David Vearing at the Division of Applied Chemistry.

Aileen McCulloch at work in the documentation section.
Photo: Allan Edward

Moves to make greater use of supercomputer

In January this year CSIRO bought the Control Data 205 'supercomputer' outright in a move designed to help keep Australia internationally competitive in computing.

When announcing the deal the Minister for Science, Mr Jones, said it was imperative that a supercomputer remain available to Australian researchers and companies.

'The Control Data 205 is a national facility of great importance. It is playing a vital role in many scientific and technical developments that are essential for the future economic wellbeing of Australia,' Mr Jones said.

The supercomputer has a 16 million byte memory and is able to perform 400 million calculations a second at peak operating speed.

At the time of the purchase CSIRONET's chief general manager Mr David Glavonjic said CSIRONET would be responsible for the marketing of the service, especially to the private sector. 'CSIRONET will continue to operate the machine on a facilities management basis. This means it is available via the CSIRONET network and CSIRONET will receive payment from CSIRO to cover running costs associated with its use by CSIRO scientists.'

Since then CSIRONET has made two key appointments to actively market the 205 to potential government and industry sectors and further assist CSIRO users.

Mr Terry Holden, who many CSIRO staff will know, has been appointed national manager, supercomputing services. Mr Holden had been with CSIRO for 39 years and retired from CSIRONET in January 1984 as assistant Chief. Since then he has worked in private industry for Logica and the Lionel Singer Group.

Mr Holden is responsible for all aspects of the service including marketing, software development, consultancy and liaison with users and potential users of the supercomputing services.

Mr Holden has been visiting divisions to find out how they are using the machine and what steps CSIRONET can take to improve its service to divisions.

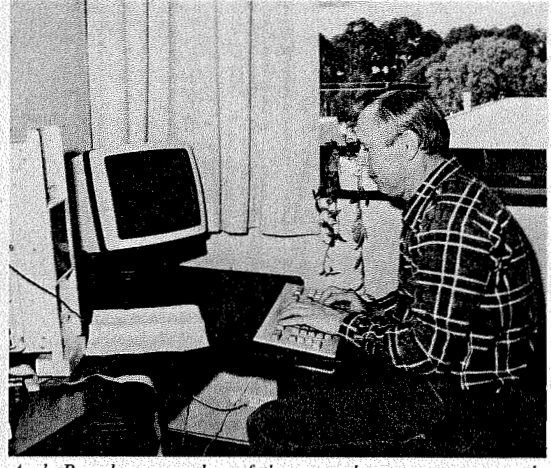
'I'm listening as hard as I can to what what our CSIRO clients are saying,' he said.

Having the machine is just the start of a supercomputer service. To really make the hardware sing and achieve real results, good applications software for a variety of uses is needed.

Many of the divisions which have been using the supercomputer have developed applications that are of real interest to industry.

Mr Holden explained that with the close rapport these divisions have developed with their associated industry sectors, a real opportunity exists for the divisions and CSIRONET to work together to bring this expertise to industry.

At the moment more than a dozen divisions are using the supercomputer for work as varied as modelling 'flu viruses (Division of Protein Chemistry) or weather patterns (Atmospheric Research). To help CSIRO users Dr Charles Johnson from the Division of Materials Science and Technology has been seconded to CSIRONET. His primary role is to assist research workers achieve the best possible use of the 205. He is also involved in the broader aspects of the use of supercomputers for the benefit generally of Australian research workers.



Arch Brayshaw, member of the network support group at the Data Centre. *Photo: Allan Edward*

CSIRONET takes over from CDA

In a move designed to rationalise the Australian market for bureau services, Control Data Australia (CDA) withdrew from the computer bureau market in December last year. CSIRONET was then chosen to take over most Cybernet customers in eastern Australia.

In making the announcement Mr Trevor Robinson, managing director of CDA, said the decision to withdraw from the computer bureau market was part of the company's recent restructuring program.

'CDA is concentrating its attention on its core business of computer systems, third party maintenance, education services and data storage products. We believe computer bureau services can best be handled by organisations dedicated to the business.'

He added that CDA was vitally concerned that Cybernet customers were looked after properly. This was why CSIRONET had been chosen to take on most of its customers.

CSIRONET's manager bureau services, Mr Keith Robinson, said because of CSIRONET's long standing relationship with CDA and its experience in providing bureau services, the transition to CSIRONET in most cases was achieved with little disruption.

'Because of this experience only minimal conversion work was required for most customers,' he said.

Cybernet customers in New South Wales, Victoria, Tasmania and South Australia are now using CSIRONET.

They had mainly been using Cybernet for business, scientific and technical computing. Examples of the applications include financial planning, inventory control and modelling and simulating for mining, manufacturing and construction.

Telecom Australia, a former Cybernet customer and currently CSIRONET's largest client, has been using CSIRONET since 1985 for monitoring the performance of its telephone network and the forward planning and contract administration of its telephone exchange and transmission route construction.

Rejig of marketing structure designed to give great flexibility

In late April the chief general manager Mr David Glavonjic announced a major internal restructuring of CSIRONET with the establishment of marketing groups to focus on particular horizontal markets.

'The previous structure, while well developed for a research organisation, did not give us the flexibility and responsiveness required to fully meet our customers' needs or satisfactorily exploit opportunities we saw in the market place,' he said.

Mr Glavonjic said CSIRONET was still committed to conducting development work. He believed it was extremely important for Australian organisations to develop and market their own products rather than just sell overseas offerings.

The new structure divides organisation activities into five main areas — data centre, services and products division, sales division, finance and administration and research and development.

The role of the services and products divisions will be that of a proactive market driven group responsible for the performance of CSIRONET's products. It is from within this group that major announcements regarding new products and services will come.

The disparate business arms are being streamlined and brought together into five major product and service areas: bureau services, professional services, value added services, information services and supercomputing services.

The managers of these product and service areas are all long term CSIRONET employees who have a good understanding of both market realities and the technical details of the products and services in their area.

Mr Keith Robinson will head bureau services. This group will be responsible for the installation and support of applications software systems, facilities management services and applications systems.

Dr Robert Dakin will lead the value added services group, whose present products include electronic mail, micrographics, PC products and the TFS. Growth areas are expected to be electronic data interchange and expert systems.

Information systems led by Mr Brian Higgisson will have a primary responsibility for information dissemination services. Within this area falls CSIRO's Australis service, and Inform, CSIRONET's new easy to use information delivery system.

The professional services group includes consulting services, support of user queries and support of external tender responses. This group will be led by Mr Peter Garrard.

The supercomputing services group led by Mr Terry Holden will be responsible for the commercial exploitation of the Control Data 205 service, facilities management arrangments with CSIRO and specialised consulting services in supercomputing.

Mr Fred Vezis, general manager (products and services), said there would be close cooperation both within the product groups and with other sections within CSIRONET.

'This reorganisation is an important step in the conversion of CSIRONET from a research and development organisation to a fully commercial one,' he said. 'The changes are designed to allow us to attack the markets that our managers have identified as winners.'

The portfolio of tomorrow's products will find their genesis in a separate research and development unit. This unit will be responsible for attracting R&D funding to CSIRONET, and will provide the coherence and focus required to maximise the benefits of hard won research and development funds.

New sales team now in place

Last October, CSIRONET appointed a sales force to aggressively market its full range of services.

Announcing the appointments, CSIRONET's chief general manager Mr David Glavonjic said he was delighted that CSIRONET had been able to assemble a sales team of such high calibre.

'Establising a sales team is an important step that has greatly assisted our commercialisation efforts,' he said. 'The breadth of experience of our team will be a great advantage when marketing CSIRONET, an organisation with a wide range of services.'

The salesmen are located in Sydney, Canberra and Melbourne, and are not employed under CSIRO terms and conditions: instead they operate under standard employment and salary conditions for sales personnel in the computer industry.

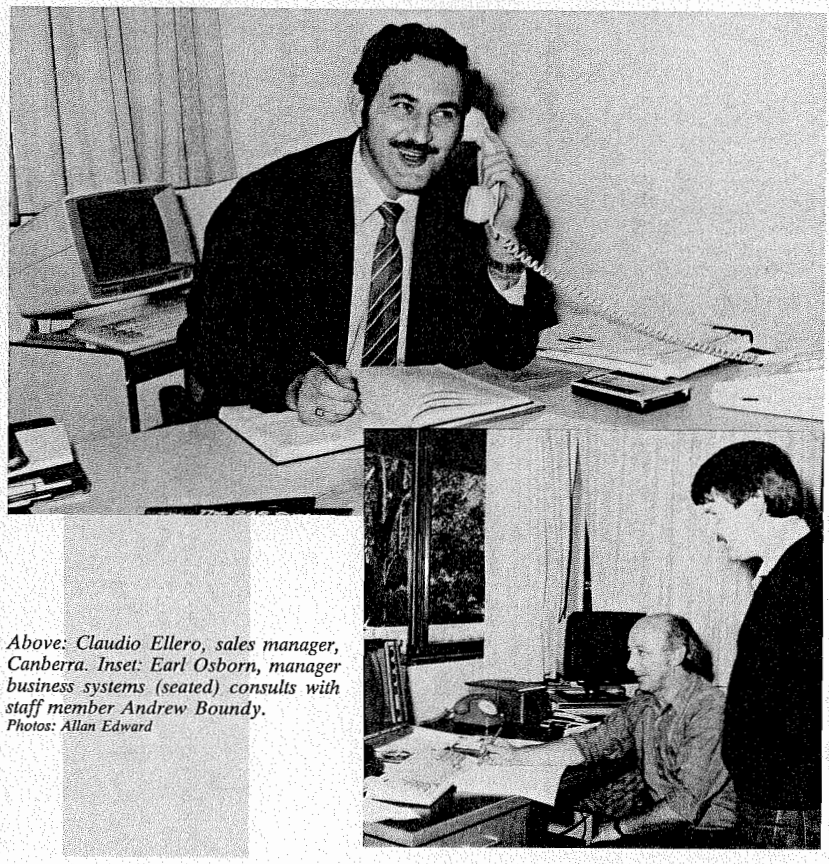
National sales manager Mr David Hattrick has a strong entrepreneurial background with a wide range of experience in information technology and other industries. He has worked in sales and marketing in high technology industries in Australia and the United States. While in America he worked for the Westinghouse Electric Corporation and on his return to Australia, worked with DTX Australia Ltd.

As national sales manager, Mr Hattrick is responsible for establishing and developing the CSIRONET sales division. He believes CSIRONET is poised on the edge of an exciting era and he is enjoying being part of an organisation that is becoming focused on market demands and opportunities.

'CSIRONET has an exciting range of world class products and services that are a tribute to the expertise of the staff,' he said. 'The sales team we have assembled has a diverse range of complementary skills that I believe meets the demands of marketing an organisation with as many strengths as CSIRONET.'

ACT sales manager is Mr Claudio Ellero. Mr Steven Heyen is northern sales manager based in Sydney and Mr John Villiers is the Melbourne-based southern sales manager.

Since starting in October, the team has been working hard visiting present and potential customers and putting into place the sales and marketing activities required for any organisation competing in the high technology field.



Above: Claudio Ellero, sales manager, Canberra. Inset: Earl Osborn, manager business systems (seated) consults with staff member Andrew Boundy.
Photos: Allan Edward

The power of positive thought

All those laboratory wits and philosophers out there — here's your chance to have your words recorded for posterity. One CSIRO employee has an idea about how to capitalise on the current turbulent times.

Change needn't only bring difficulties, it can also bring opportunities. That's the message of Tim Healy at Headquarters. Tim is an optimistic sort of fellow and he's hoping he can generate more of the same among other CSIRO staff. Here's his plan:

'We keep hearing about the problems of change but little about the opportunities that change brings. For every problem there are 'n' opportunities. Instead of looking inward and groaning, let's look outward and cheer. Instead of talking about what's wrong with CSIRO, let's talk about what's right with it. Instead of trying to minimise our weakness, let's maximise our strengths. Let's concentrate on building the good things rather than reducing the bad things. Let's talk about what we can do for Australia. Let's talk about how good we are. Let's talk about the things we find really exciting in what we do. Let's talk about the terrific qualities in those we work with. Let's talk about the environment that makes us fire. I'd like to collect a heap of positive "thoughts for the day" from people in CSIRO. Maybe we could put together a date pad or diary — so I need at least 1400 for five years. McKinsey staff who have been working at HQ on the reorganisation have said they will contribute 10 each. Let's see if others can match that. Please contact me on 062-48 4535 or PO Box 225, Dickson ACT 2602.'

Reaction

Cont. from p.4

report. I think it presents some great challenges to the organisation in its research and communication tasks. I am certain it will prove highly significant in clarifying our goals and objectives and consequently should maximise the impact of CSIRO's research on the Australian economy.'

The Chief of the Division of Food Research, **Dr Des Walker**, said: 'Whilst I can see some logic in the proposed restructuring it is a pity that in the case of my Division the reorganisation could very well make the maintenance of necessary research links more difficult. I think there is a very strong argument for keeping the dairy and meat research laboratories directly linked to the food research laboratory.'

The Chief of the Division of Building Research, **Dr Lex Blakey**, said: 'The idea of relating to business sectors seems reasonable as long as it is not applied dogmatically. My objection, and it is a very strong objection, is to the concept of separating civil construction from building systems. That is just absolute nonsense and a gross misunderstanding of the way the building industry works.'

The assistant Chief of the Division of Wildlife and Rangelands Research, **Dr John Calaby**, said: 'I think it makes sense to organise along the lines of business systems. We will be in a new Institute but I don't believe the changes would impact greatly on the Division's research programs.'

The acting Chief of the Division of Forest Research, **Dr Alan Brown**, said: 'In total the proposed arrangements would be satisfactory from our view point. Under the proposals, we have retained our contacts with the biologically oriented divisions and enhanced our contact with the processing sector. We would welcome a review of the proposed name, Forest Industries, to ensure that the biological component is appropriately recognised.'

The Chief of the Division of Information Technology, **Dr Tommy Thomas**, said: 'I strongly support the recommendations. I have been through the consequences of a McKinsey-directed review in my early career. I believe the methodology has been proven and we would benefit from treating the report very seriously.'

Environmental Mechanics looks at key problem in N waste storage

A research project at the Division of Environmental Mechanics may assist in planning the storage of nuclear wastes in the United States.

One of the scientists on the project, Dr John Knight, said US authorities had already shown an interest in the work, and an agreement may be signed soon..

Dr Knight and his colleague, Dr John Philip (Chief of the Division), are using a mathematical technique called quasi-linear analysis to predict how water will seep downwards when it encounters an 'air filled cavity' — ie. a hole in the ground.

This is of particular interest in America because authorities there are looking at the viability of burying nuclear wastes in disused mines in arid areas.

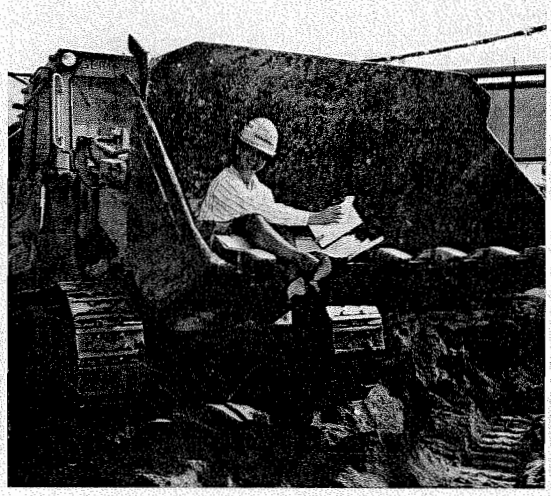
For long term safe storage, the encroachment of water needs to be minimised.

As part of the work, the Division's scientists have taken out a provisional patent on a shape they have shown to be the optimum for preventing water penetration through the roof of a tunnel. The cross-section of the roof should be a parabola, a mathematically simple shape.

Quasilinear analysis has been used before for the study of soil-water movement. In this project it has now been adapted to investigate the steady downward flow of water around cavities in an otherwise uniform soil.

The work has already disproved several assumptions about the behaviour of water when it seeps towards and around cavities.

Dr Knight said it's hoped experimental studies to test the theoretical results will be undertaken soon by other Environmental Mechanics scientists.



No, this photo has absolutely nothing to do with the McKinsey report. It was in fact taken while demolition work was in progress as part of the CSIRO Floreat Park Laboratories redevelopment. The area being demolished is the main entrance/reception, library and conference room. This area had joined the two main buildings of the Division of Minerals and Geochemistry and the Division of Water Resources Research. Pictured seated in the Caterpillar 'dozer bucket is librarian Bernadette Waugh. Photo: Bill van Aken

Related letters

Dear Editor,

Perhaps our latest re-organisation is an opportune time to examine provision of services which are impracticable to maintain on a divisional level but which could fall naturally within the scope of the institute director's office. These might include:

* a legal/patents section to give advice on the drafting of provisional patents or proposed contracts before they become the province of Sirotech or outside organisations;
* a process design/cost estimating group to answer the basic questions of what will it look like and how much will it cost?
* an analytical co-ordination unit to expedite the use of specialised analytical instruments within the institute on either a co-operative research or inter-divisional contract basis;
* an economic intelligence section to advise on marketing and market opportunities;
* a mathematics consulting group/software library to facilitate the selection of appropriate mathematical techniques together with the most suitable software.

Provision of such services would not only streamline our own activities but also greatly enhance the transfer of research derived benefits to the Australian community at large.

Heikki Mamers
Division of Chemical & Wood Technology

Dear Editor,

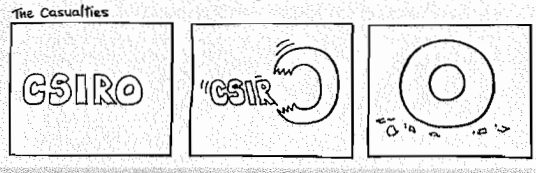
I found it ironic that we received the discussion paper on Industrial Democracy and Employee Participation the day before the announcement of the CSIRO reorganisation. The principle embodied in the discussion paper is that those affected by a decision should be involved in making the decision. There are practical reasons for this. You cannot expect to arrive at the best decision without such participation and those who feel adversely affected by the decision or upset by their treatment will act to undermine its implementation.

As far as the content of the announced reorganisation, my major concern is that the underlying philosophy is merely one of short-term economic advantage. This can easily be detrimental to the long-term interests of the community as a whole. For example, a 'rational' economic approach to whaling would involve exploitation of the stock as quickly as possible until it was exhausted, then selling your ships and putting your money into something else (see *New Scientist* 5-6-1986). We must not divorce our needs as a society, our environment and natural resources from those 'business systems' that can also threaten them. Which industry is going to give priority to keeping our air or water clean or conserving our forests?

I applaud increased links to industry but it must be enshrined that the customers we ultimately serve are all Australians.Take for example the 'business system' of wool. This Division receives significant funding from the woolgrower. Our prime strategy in research and development is therefore to maximise the benefits in terms of increased sales of wool. However, there needs to be counter-balancing forces built into the system so that we use our strength in this primary industry to building allied secondary and tertiary industries. Even if there is no advantage to, in this case, the woolgrower. The work of CSIRO must be tied to the maximum long-term advantage of all Australians.

Peter Lamb
Division of Textile Industry

And a final, succinct, comment from Environmental Mechanics:



New seminar series

Project management on the training agenda

Maximum effectiveness in research programs requires not only excellent scientific skills among project leaders but also, increasingly, management skills as well.

Management of scientific research projects has been the subject of considerable study in recent years, particularly in the United States and Europe.

How are winning projects selected? How are they funded? What tools are available to control and monitor progress? At what stage should the decision be made to terminate a project?

Research is the *raison d'etre* of CSIRO. Many project leaders have had little or no formal management training, though there is an enormous amount of accumulated wisdom in the Organisation.

Improve efficiency

To improve CSIRO's efficiency, the Organisation is making the training of project leaders a high priority.

Among the initiatives to be launched soon is a three-day course for project leaders which has been designed by CSIRO staff under the auspices of the staff development and training unit.

The unit has been working for some time on the design of this course, which would be made available in each major capital over the coming months.

The objective is to raise the awareness of project leaders in areas such as project selection, project control, leadership styles, budgeting, computer applications and legal aspects of project management. The course will complement those already held and proposed under the aegis of external consultancy firms and is an indication of CSIRO's resolve to be at the forefront of this important training area.

The final course content and schedule will depend on the evaluation of the pilot course to be conducted in Canberra on 3-5 August.

Further details on the course content, dates and venues are available from Ati Graham, staff development officer, PO Box 225 Dickson ACT 2602. PH: 062-48 4122.

Get set for the BM fun run

CSIRO's annual Black Mountain Cup fun run will be held in Canberra on Friday 17 July.

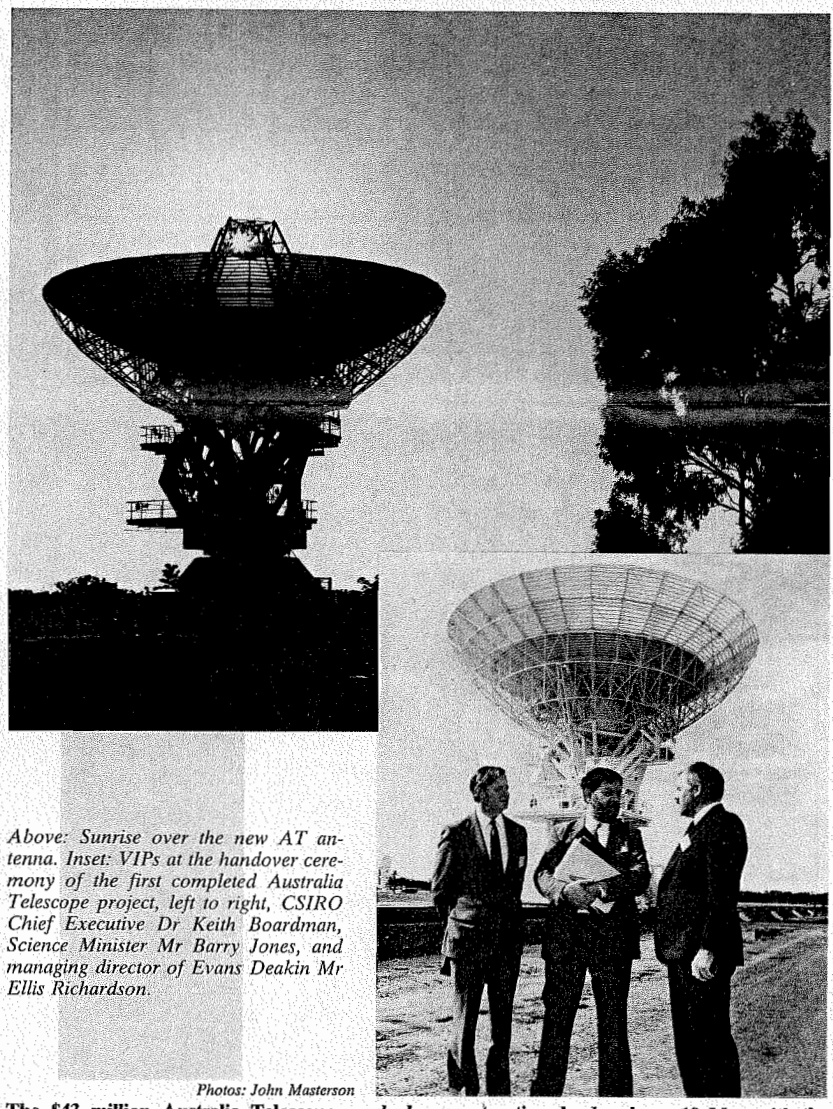
Already CSIRO staff are pouring out of their laboratories and offices for training runs on the rugged 5.6km course on the slopes of Black Mountain.

The race organisers are looking for another close battle for team honours this year. Last year the prestigious cup was won by the team from Plant Industry, with Water and Land Resources only 16 seconds behind and Forest Research a very close third.

The event starts at 12.30pm at the Pye Laboratory opposite the Black Mountain Library.

For information and entries call Greg Heath 062-46 5692 or Colin Hazelton 062-46 5939. The Black Mountain Cup is sponsored by Sirocredit.

First Australia Telescope antenna completed



Above: Sunrise over the new AT antenna. Inset: VIPs at the handover ceremony of the first completed Australia Telescope project, left to right, CSIRO Chief Executive Dr Keith Boardman, Science Minister Mr Barry Jones, and managing director of Evans Deakin Mr Ellis Richardson.

Photos: John Masterson

The $43 million Australia Telescope reached a construction landmark on 19 May with the handing over of the first antenna.

The Minister for Science, Mr Jones, accepted the antenna on behalf of CSIRO at a ceremony held at the compact baseline array site at Culgoora near Narrabri.

Mr Ellis Richardson, managing director of the engineering and manufacturing company Evans Deakin Industries, handed over the antenna, which will now be fitted out by the Division of Radiophysics.

The AT will consist of an array of antennas in NSW — six at Culgoora, one at Siding Spring and the existing CSIRO radiotelescope at Parkes.

When operating as one the antennas will simulate a giant telescope 300kms in diameter.

The design and construction of the antennas is providing Australian companies with vital experience in engineering space technology. The telescope should be fully operational by late 1988 and will be operated by the Division as a national facility.

Mini-budget
Cont. from p.1

'As soon as the new institutes are in place the relevant directors are going to have to identify which sectors they service and which ones have the potential to be a source of funds for CSIRO.'

With less appropriation funding and more industry funding, an important human management question arises.

'We will have to examine our policies relating to the employment of staff on non-appropriation funds, ensuring the appropriate mechanisms are in place to guarantee the continued employment of key staff,' said Mr Farrar.

'Guaranteeing continuity of funding when money is being contributed by a sometimes fickle industry sector is a problem.'

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Apply now for travel awards

Applications are invited for the 1987 Qantas-CSIRO travel awards which provide opportunities for staff to gain experience and training related to their careers.

The awards are open to the broad staff categories: trades, technical, professional (not including research scientists) and clerical/administrative, and are tenable in suitable overseas countries for between three and six months (although shorter periods may be considered).

Application forms and information sheets for the 1987 awards are now available and have been distributed to divisions, units and regional administrative offices.

The closing date is 31 July 1987.

For further information contact Michelle Narracott on 062-48 4128.

Townsville ANZAAS

The 57th ANZAAS Congress will be held at the James Cook University, Townsville, on 24-28 August.

Not far from idyllic beaches, coral reefs and rainforests, delegates will be turning their attention to 'Science and Life in the Tropics' — a theme that will provoke discussion of some of the problems and circumstances peculiar to Australia's north.

Diverse subjects

CSIRO speakers will be contributing on subjects as diverse as the ecology of rainforests, Queensland oil shale as a fuel source and the worrying quarantine problems facing our northern border.

Further information may be obtained from:

The Organising Secretary,
ANZAAS Congress,
James Cook University,
TOWNSVILLE QLD 4811

Letters to the Editor
Cont. from p.2

the same issue of *CoResearch* as your own letter? Those articles, though vaporising vehemently to the varletry about the BIPC's vendibles and extolling the valerian value of its vinasse, are but a veneer, a *vernix caseosa*. They do not provide viaticum. If valiant Doug would merely point to the vigia in our vagarious waters, I would feel less impressed into the *Volks sturm* and less valetudinarian with respect to the ailments of what was formerly known as the Editorial Service.

Regardless of what can be achieved by the vignetters, science publishing now and always belongs to the vanity press (much like *CoResearch* itself) and hence remains violable. Neither visitants nor visionaries, only the Doug Cockses with visceral appreciation and conviction that *vincit omnia veritas* can void the final showdown at Vigrid and *vae victis*. Verbum sap.

Vive valeque,

John Lenaghan
Printing & Publishing Unit

(P.S. Despite the ventose in *CoResearch* No. 301 concerning internal communication, it was on this occasion 100 per cent efficient. Cocks got his answer on the very same page!)

Paleolithic disks

Dear Editor,

My previous letter to you (18 August 1986 concerning the weed species *Wire coathanger*) warned *inter alia* of the inherent dangers awaiting 'hard' scientists who involve themselves with the less reputable 'soft' sciences. Your recent article on the (apparent) recording of music on stone disks by Palaeolithic man demonstrates another aspect of the same phenomenon. Viz, the tendency of modern researchers to interpret outdated experimental results in the context of their own experience instead of the context of the ancient experimentalist. Thus, because modern archaelogists grew up during the age of rock and roll they think in terms of (gramophone) records. Had the disks been found in a sports-crazed country, such as Australia, no doubt they would have been touted as 'proof' that discus throwing was one event in some Palaeolithic Olympics. Similarly, 100 years hence, we can expect a reinterpretation of these disks to imply the existence of Stone Age micro-computers!

Now, the facts of the matter are both much more mundane and much more obvious. In the popular mind, the boomerang may be associated with the Australian Aboriginal, but it is not by any means restricted to that people. It is known, also from Europe and Africa[1] — but from a much later date than in Australia because, of course, our indigenous peoples are much smarter than anyone else's indigenous peoples[2]. Because of the separation in time and space of the appearnace of the boomerang, it seems that it was separately reinvented by different scientists. (During the time under consideration, 35 000-10 000 years B.P.) the onset and recession of global glaciation tended to distract the attention of contemporary scientists away from the responsibility to publish experimental results in well-recognised journals — which in any case were rare at the time[3]).

Given the above information, it is immediately clear that the African disks are an experimental form of boomerang. To determine the reason for the circular rather than curvilinear shape requires the ability to transpose one's mentation process from 'modern' to ancient.

At that time, sympathetic magic rather than deduction and induction, was all the go for scientific research — such fashions come and go[4]. Clearly, therefore, if one wishes a missile to follow a circular trajectory it should have a circular shape. At least for the first trial models. On the basis of this insight it is possible to predict, sight unseen, that the earliest versions of the African disks will be flatter than later versions — reflecting the discovery of the fact that a slight twist to the structure of a missile provides it with interesting aerodynamic properties.

As to the markings on the disk surface, the most obvious conclusion (and therefore the most ignored) is that they are personal identification. Imagine, if you will, a row of 25 or more (for adequate sampling reasons) Palaeolithic test pilots repeatedly hurling disks in order to measure their performance.

In order to reduce experimental variation it is important that the same person hurl the same disk for a statistically satisfactory number of times. Consider the situation, however, once the boomerang effect had been learned by all test-pilots; at t_0 the command 'throw' is given by the supervising scientist; between t_5 and t_7 (in seconds) 25 stone disks are returning, at high speed, towards the pilots.

There would be an obvious incentive to prevent the disk from actually impacting on its launching pad — given available technology, disks were difficult and time-consuming to make. Therefore returning disks were plucked from the air in the manner of a frisbee. The skilled pilot would then use his[5] fingertips to 'read' the identity of the disk's owner — thereby demonstrating that

Cont. on p.12

CSIRO on display at the Rocks

The Rocks, site of Australia's first European habitation, is one of the most popular and colourful tourist areas in Sydney.

Every old stone building reeks with history. Such a one is the Old Union Bond Store in North George Street, originally High Street — Sydney's first street — and a stone's throw from Cadman's Cottage, Australia's oldest building.

The Old Union Bond Store was built in 1841 and was purchased a few years ago by Westpac with the intention of incorporating it into its proposed new banking museum. The museum is now complete, with the old section containing Sydney's oldest bank (built in 1817 under the auspices of Governor Macquarie) on the ground floor. Before 1817 the currency was rum.

The first floor of the old building has been set aside for guest exhibitors and CSIRO was asked to be the inaugural exhibitor with a running time of six months. Future exhibitions will be on display for only three months.

The invitation was a real challenge to Sydney's CSIRO communicators but one we could not afford to miss. In the end, however, it was a triumph of CSIRO co-operation.

Just about every division became involved directly or indirectly, as well as the New South Wales state committee, the film and video unit, the public communication unit and the Sydney office of the national information network. It has been, I think, a major success story from the point of view of divisional/central co-operation.

The state committee started the ball rolling by asking the (then) Executive for a grant of $30 000, without which the project would have been stillborn. Following this financial blessing, the public communication unit stepped in with graphic design and film unit support.

Due partly to the restrictions of space — the old convict-hewn sandstone walls could not be covered — and partly to the extraordinary diversity of CSIRO's research, it was decided to spend half the money on a special eight-minute audio visual targeted at a 'Mums and Dads' weekend audience. This has been most successful and credit must be given to AV Productions to whom the job was contracted.

AV Productions took the fairly radical step of using Rod Quantock of 'Australia — You're Standing In It' fame as narrator. This raised a few eyebrows within CSIRO but not many outside, and it has the great advantage that it keeps the audience riveted for eight minutes.

The audio visual introduces the show which then leads the viewer through a maze of display boards of large laminated photographs and captions depicting the work of most divisions. This labyrinthine design was necessary in order to keep the walls clear.

Finally, a glassed-in section at the end of the exhibition was used for a display of historical artefacts. A search among the divisions for such artefacts revealed that in the past many have been lost, cannibalised or thrown over the gap.

The final selection of artefacts was made from three main groups: oceanography; solar spectrometry and communications; and computation. Logistics were involved in the final choice, with most of the *objets de science* coming from the Sydney region.

Special thanks must be given to the divisions of Radiophysics, Oceanography and Mathematics and Statistics who lent special items, the Museum of Applied Arts and Science in Sydney who lent the model of the George Julius totalisator, and CSIRO headquarters who lent of the model of *R V Franklin*.

In particular I would like to thank Sara Twigg-Patterson of the public communication unit who designed our exhibit, arranged for enlargement of photographs, captions, pedestals and display cases, and gave the exhibition the professional finish of which we can all be proud.

Honourable mention as well to Malcolm Paterson of the film unit and Jack Rhemrev of the Sydney national information network office who nursed the audio visual through some (at times) rather nerve-wracking teething problems. Thanks too to the staff of Sydney divisions who have given up their time on weekends to act as guides to the exhibition. Would anyone else who would like to take part in this activity in the coming months please let me know.

Yvonne Esplin

Of Equal Concern

Having flooded the Organisation with EEO census forms over the past few weeks I thought it appropriate to provide an update on how the census is progressing. In general it has been well received throughout the Organisation.

Given the geographic spread of CSIRO the task of co-ordinating the distribution and collection has been no mean feat. However, the tremendous support the EEO unit has received from chiefs, divisional staff and contact officers has helped overcome any major logistical problems and enabled the smooth running of the census.

Reports on return rates are beginning to be forwarded to the EEO unit and current indications are that return rates are extremely high (in fact, some areas have reported 100 per cent return rates).

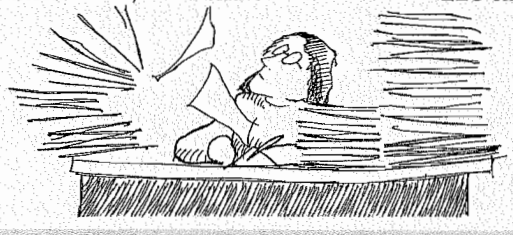
Such success is certainly a tribute to the hard work of all those involved, and indicative of the high level of commitment to EEO in CSIRO. The results from the census will be released and available to staff.

I would like to reassure everyone that all census forms are confidential and will be treated as such. We have neither the resources nor inclination to seek information on individuals.

Any queries or concern on the wording of any of the questions received by the EEO unit have been passed to the census consultant, who will take these comments into account when analysing data.

Thank you to everyone who has taken the time to complete the forms and return them so speedily. The sooner we have all the forms sent over to WA the sooner we can report the findings. Keep those forms coming in. I hope to be able to start providing feedback on the results in a few months.

Carmel Macpherson
EEO officer



Letters
Cont. from p.11

sympathetic magic is adequate for the invention of Braille, also!

En passant, it is worth noting that the modern discoverers of the disks imagined themselves able to discern a tune when the disks were played at 33⅓ rpm on a record player. The fact that, in truth, they were listening to high-speed repetitions of an unpronouncable name in a primitive tongue speaks volumes for the musical taste of modern archaeologists — or, perhaps, of modern music generally.

In summary I repeat my admonition against 'hard' scientists messing with 'soft' science, but, when this must be done, the technique of interpreting ambiguous data within its own context (and none other) is an essential. The example given is particularly apt as mention of the Palaeolithic will bring to the minds of most of us the thought processes of several of our colleagues.

Notes & References

[1] Anon, 1957. *The Child's Wonder Book of the History of Humanity*, Neck-and-Albatross Press, Goondiwindi.

[2] 98 per cent ± three per cent of people who are long term residents of Australia maintain that is the best place in the world in which to live (pers. comm., my mates). The fact that it took Europeans at least 40 000 years longer than Aboriginals to realise this says a great deal about Aboriginal nous.

[3] Nurrimooki, 8412 B.C., 'The Quality of Distributional Media; Then and Now' in *The effects of the Recent Glaciation on Techno-Scientific Development*, ed. Pitjanjatjarra Elders. Jones.

[4] If the value of sympathetic magic as a scientific philosophy is doubted, then reflect upon the fact that it was adequate to: domesticate more animals than are domesticated today; found agriculture; found (no pun intended) metallurgy; build empires; practice genocide; etc, etc.

[5] 'His' rather than 'her/his' because everyone is familiar with cave-man attitudes towards gender and the division of labour — and being a pilot is glamourous.

P R Thomas
Division of Forest Research

Image problem

Dear Editor,

Image! Communication! Public Relations! How many times do we hear that we must develop our public image, communicate with the public and indeed talk amongst ourselves. I recently had occasion to visit, for the first time, the font for all communication — CSIRO HQ. What a shock!

Weeds around the base of our name plate and rubble scattered on the road from an adjacent construction site beckon the new arrival. A bright No Entry sign and and sign proclaiming 'Goods Vehicles Only' complete the welcome which is quickly followed up by a further bevy of bright No Entry signs. In case one is in any doubt as to the real nature of a CSIRO welcome, as the penultimate corner is turned, yet another angry pair of No Entry signs ably supported by a One Way sign, glare at the intruder. The enthusiasm and the excitement of a head office visit wanes even further with a last minute shift of venue and a casual delay to the meeting.

Communication? Public Image? Headquarters heal thyself!

Stephen Midgley
Division of Forest Research

Butterflies find a new home at ANIC

Could it be that the meticulous attention to detail necessary for the practice of accountancy can provide the expertise for a totally different pursuit — butterfly collecting?

Mr David Crosby, who has just donated his 'priceless' butterfly collection to the Division of Entomology's Australian National Insect Collection, was a professional accountant until five years ago, when he left to concentrate on his primary interest, butterflies.

Now he is able to pursue this interest as an entomological consultant. Data accumulated during his years of collection have made him an expert in the graceful and beautiful world of lepidoptera.

All specimens in his collection were carefully labelled with date and place of collection. These data provide valuable information not only to lepidopterists but also to people concerned with the environment.

According to Dr Ebbe Nielsen, lepidopterist at the Division of Entomology, butterflies are one among the best indicators of changes occurring in the environment. These changes could be climatic or related to man's impact on nature.

Mr Crosby put together his butterfly collection over 45 years, during which he travelled extensively throughout Australia.

There are about 13 000 butterflies in the collection, all of them Australian.

The butterflies of Victoria are particularly well represented — about half the specimens were captured in Victoria.

Mr Crosby was 12-years-old when he started amassing his collection, and he has retained some of those early specimens at home for the sake of nostalgia.

But the great majority of the insects have been given to ANIC.

'I collected mainly to obtain distributional records, and as I've now catalogued all the specimens I thought other people may well want to use them,' he said.

The Division had been aware of Mr Crosby's collection for about 20 years. Dr Nielsen said he was very pleased the Division had now received it.

'If it is not THE best collection in private hands in Australia, it certainly is one of them,' he said on the day last month when the Division took possession of the collection.

All researchers of Australian lepidoptera make use of ANIC because it is by far the largest insect collection in Australia being used for active research.

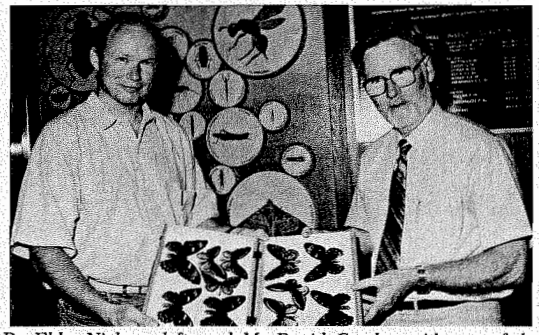
It is the second time Mr Crosby has made a major contribution to ANIC. He acquired a friend's collection in 1976 when the friend moved to Queensland. Mr Crosby donated that collection (of about 4000 specimens primarily from the east coast) in 1984.

He is now principally involved in entomological surveys for State and local government bodies, and is at present documenting a survey on the endangered Eltham copper butterfly in Victoria.

Most of his work relates to conservation, 'but I'm not a greenie', he hastens to add. 'I'm interested in seeing a rational approach to the conservation of habitat'.

Some of his work has been viewed by more than a million people — at the very popular Butterfly House at Melbourne Zoo.

Mr Crosby spent over six months full time on an intensive program to breed the butterfly stock for the zoo in time for official opening in December 1985.



Dr Ebbe Nielsen, left, and Mr David Crosby, with one of the many boxes of specimens in the collection donated to ANIC.

Million $ sales milestone for publications office

The CSIRO bookshop/publications sales office has increased its sales of publications by nearly quarter of a million dollars on last financial year, with the implementation of new marketing strategies.

By 30 June the incoming revenue from subscriptions to CSIRO research journals and the sale of books will probably reach the $1 million mark for the first time in CSIRO's history.

At the end of April, journal revenue was $610 384 and book sales $302 458 — a total of $912 842. At 25 May the figure was $960 898.

A revenue earning grant of $30 000 on 1 July last year has helped in putting the marketing strategies into operation.

The encouraging factors over the past 10 months have been: the positive response from CSIRO divisions in selling their new book titles through a central marketing point; the co-operation of commercial bookshops throughout Australia in stocking and selling CSIRO's popular books; the assistance of the regional information managers in liaising with customers; the successful response from journal agents internationally in remitting subscriptions in United States dollars; the introduction of targeted publicity material in the form of brochures, posters and leaflets; the upgrading of retail sales through the CSIRO bookshop in Melbourne (counter sales have doubled in 12 months); and the dissemination of specially prepared journal publicity sheets with a credit card facility to attract new subscribers.

An innovation has been the recent CSIRO at Work publications display in windows of key bookshops in capital cities. These have been organised to promote a better image for the Organisation's publications nationally. This exercise has involved close co-operation with 10 divisions, who have arranged colourful photographic displays depicting current research in CSIRO of interest to the general public.

The new commercial CSIRO bookshop catalogue — just released — will also secure further income this financial year with a distribution of 40 000 copies within Australia.

In the 1987/88 financial year a new marketing plan will be devised to tackle the international scene — CSIRO needs a higher profile and stronger sales base for its publications overseas.

The introduction of database marketing will start soon and hopefully the sales and distribution operations will be fully computerised. The future looks bright although we are short staffed. Jeff Prentice

Stop Press: *The bookshop/publication office has topped the million dollar mark for the first time. At presstime the total was $1 052 152.18. Congratulations.*

Appita award to CSIRO scientist

A CSIRO scientist has been honoured with a major award from the Australian and New Zealand Pulp and Paper Industry Technical Association (Appita).

Mr Alex McKenzie, a principal research scientist at the Division of Chemical & Wood Technology, was awarded the Appita-Oertel Nadebaum Distinguished Service Award 1986.

The award, inaugurated in 1985, is for Appita members who have made substantial contributions to the administration and operation of the association over a long period. Mr McKenzie joined in 1955.

Queen's birthday honours

Several past and present CSIRO members received Queens birthday honours this year.

Among them was the former head of the Organisation's Darwin Laboratories, Dr Michael Ridpath, who received the Order of Australia in recognition of his services to CSIRO and education.

Also honoured was Dr June Olley, leader of the seafood technology section of the Division of Fisheries Research, who was received the Order of Australia. It was the second special honour in 12 months for Dr Olley, who also received the 1986 Award of Merit from the Australian Institute of Food Science and Technology.

This year's list also honoured the former Chief of the Division of Food Research, Dr John Christian, as well as Dr Helen Newton Turner, Mr J A Birch and Dr L J Webb.

***CoResearch* is produced by the Public Communication Unit for CSIRO staff. Readers are invited to contribute or offer suggestions for articles. The deadline is the last Monday before the issue month. Editor: Liz Tynan,, PO Box 225 Dickson ACT 2602. Ph: 48 4479.**

CoResearch

CSIRO's staff newspaper

No. 304 August '87

Board introduces major restructure

After months of deliberation, it's official!

The CSIRO Board has decided that the Organisation is to undergo a major restructuring.

Making the announcement after last month's Board meeting in Brisbane, CSIRO Chairman, Mr Neville Wran, said the re-organisation was aimed at placing greater emphasis on the link between scientific research and its economic and social benefits to Australia.

'The changes are designed to ensure that CSIRO plays a major role in the development of Australia's manufacturing and technological capacity in the years ahead,' he said.

'The Board's decision is an historic step which recognises the intrinsic role of fundamental research while at the same time declares that CSIRO will be contributing mightily to the current restructuring of Australian industry.'

'The Organisation has made an enormous contribution to Australia over its 61-year history and whilst the importance of agriculture and minerals will continue to be recognised, it is critical that CSIRO plays its role in the current restructuring of the Australian economy,' he said.

Under the reorganisation:

- the existing CSIRO structure of 41 divisions grouped into five institutes will be changed to 32 divisions grouped into six institutes;
- the new divisions and institutes will be more closely allied to industry and community groups;
- there will be tighter monitoring of research to maximise its economic or social value to the Australian community, while maintaining the scientific excellence for which CSIRO has a worldwide reputation;
- the divisions and institutes will perform much more of their own administrative work, reducing the number of tasks performed at the CSIRO corporate centre in Canberra and cutting red tape;
- line management will be strengthened by giving chiefs of divisions and directors of institutes greater authority while at the same time being made more accountable for their decisions and efficient use of resources;
- a vigorous program of management training will be introduced; and
- the corporate centre will be streamlined.

An independent review to start shortly will undertake a detailed examination of the activities of CSIRO's administrative headquarters. The aim of the review will be to provide a more efficient and leaner headquarters staff.

Mr Wran stressed that the main role of CSIRO would continue to be to perform long-term research which is beyond the capabilities of individual Australian companies or agencies.

He said the Board had rejected any simplistic view of the organisational needs of CSIRO. The Board has opted for a fundamental reorganisation designed to relate CSIRO's outstanding research and scientific skills to the longer-term needs of Australia and to the needs of specific industries.

The Board has agreed that that a project team will be established to implement the reorganisation following the appointment of Directors. It is the Board's decision that the fundamental changes should go ahead quickly.

Mr Wran said that the Board has decided to advertise widely the positions of directors of all six institutes and has decided upon a selection mechanism, by which process it is hoped to appoint all senior officers to the newly formed institutes by December this year.

Double Helix Club members Elaine McCullum, left, and Suzanne Murray with Experimental Scientist, Mrs Anne Dollin. Elaine and Suzanne were preparing electron microscope samples.

Photo: John Masterson

A view on life

Members of the Double Helix Club were treated to a special electron microscope workshop at the Division of Animal Production last month.

The children, some of whom had travelled from as far as Griffith, NSW, to Sydney for the event, used a scanning electron microscope.

As an example of what these microscopes can do, the children mounted and gold coated tiny native bees.

They then took detailed photographs of parts of the bees' wings and bodies in the scanning electron microscope.

The children also saw how sheep grow wool by looking at highly magnified wool-fibre cells in the transmission electron microscope.

The school children and their parents were shown how these sophisticated instruments are used in the Division's research.

The enthusiastic response of both parents and children was shown by their reluctance to leave at the end of the day.

Rural industries contribute a great deal to Australia and the Division of Animal Health contributes a great deal to the rural industries. Read about the Division in this month's division feature, pages 3-6. Cartoon by Bruce Petty.

CSIRO under DITAC

In a reshuffle of the public service following the recent Federal election, the Department of Science has been abolished.

CSIRO now comes under the jurisdiction of the expanded Department of Industry, Technology and Commerce and its minister Senator John Button.

Former Minister for Science, Mr Barry Jones, will be assisting Senator Button with the Industry, Technology and Commerce portfolio and will have responsibility for science and small business.

See Chief Executive's column p.2.

S-COR

From the Chief Executive

A column by Dr Keith Boardman

The reorganisation of CSIRO agreed by the Board at its meeting at the Long Pocket Laboratories of the Division of Tropical Animal Science followed closely after the massive reorganisation of the Federal Government bureaucracy.

The reduction in the number of Government departments from 27 to 17 saw a considerable expansion of the Industry, Technology and Commerce portfolio under Senator Button and the abolition of the science portfolio. It is fortunate for CSIRO that Mr Jones as Minister of Science and Small Business in the Industry, Technology and Commerce portfolio retains responsibility for CSIRO.

The reshuffle has the disadvantage of fragmenting the Science portfolio among a number of departments, but it brings together in the same portfolio a number of science and technology statutory authorities: CSIRO, Australian Nuclear Science and Technology Organisation, Australian Institute of Marine Science, together with the National Building Technology Organisation and the National Standards Commission. Also in the portfolio are Austrade, Australian Industrial Development Corporation (AIDC), the Bureau of Industry Economics, the Patents Office, Grants for Industrial Research and Development (GIRD), the Civil Space Program and the Commission for the Future.

There is a logical reunion of science policy and technology policy in the same portfolio. These were unfortunately separated in 1984 after the transfer of technology policy from the Department of Science and Technology to the Department of Industry and Commerce.

Barry Jones can be expected to continue to champion the vital importance of a strong Australian science effort for the development of the new technologies needed for the development of new industries and increased competitiveness of existing industries.

Mr Wran's invitation in last month's CoResearch for staff to express their views on the reorganisation resulted in a considerable number of thoughtful submissions, which were distributed to all Board members.

A recurring theme was that the "business systems" methodology as applied to a manufacturing enterprise was not appropriate for a strategic research organisation. But as I indicated in my message circulated to all staff after the June Board meeting, the term "business systems" was misconstrued to imply a downgrading of strategic research in favour of short-term tactical research.

'... a logical reunion of science policy and technology policy in the same portfolio'

The main role of CSIRO *is* the performance of strategic research in support of Australian industry and the community, but it is essential that all Divisions have defined targets and defined end users for their research to ensure that resources are concentrated on those programs with greatest potential to contribute to the Australian economy or the well-being of the Australian people.

Our research must remain at the forefront of developments of science and technology for the Organisation to fulfil its role. It is essential, however, for CSIRO to demonstrate to the decisioin makers the value of its research, and maintain an appropriate balance between the longer term and shorter term projects.

I believe that the new structure will assist greatly in the difficult task of resource allocation and should improve our interactions and collaborations with the users or potential users of our research. Their views of CSIRO have an important influence on Government and community support for the organisation.

In the new management structure, Institute Directors and the Director, Corporate Services have key roles and the Board agreed to advertise all positions. Although there will be a delay in the appointment of Directors and the implementation of the new Institute/Division structure, the Board is concerned to appoint the best possible persons.

M Keith Boardman

Total ban on smoking

A total ban on smoking in CSIRO will come into effect on 1 March next year following Management Committee approval last month.

The Manager of the Organisation's Occupational Health and Safety Unit, Mr Gary Knobel, said smoking would be banned in all indoor areas under the control of CSIRO and in all CSIRO vehicles.

Smokers would be encouraged to attend 'quit smoking' courses, which would be held in-house if feasible and if the numbers justified it.

Otherwise, Mr Knobel said paid leave of up to eight hours should be made available to smokers on a once-only basis to attend outside courses.

The ban is consistent with Public Service policy and follows a partial ban, which has been in force for more than a year. Under the partial ban smoking was prohibited in conference rooms, libraries, reception and other shared areas.

Mr Knobel said an information package would be sent to site safety officers who would be able to help with advice on 'quit smoking' courses and counselling.

'We recognise that people who smoke need to be supported in their attempts to give it up or, if they don't want to give up completely, to not smoking at work,' he said.

'Support from non-smokers is very important and they will need to be sympathetic to smokers in the Organisation.'

Smokers who refused to stop smoking at work would be counselled by their supervisors.

But Mr Knobel said the Unit was not anticipating any serious problems with the introduction of the ban.

'The partial restrictions were affecting a large number of people and we have not struck many problems,' he said.

'Most people have been co-operative. Most smokers would rather be non-smokers so they are reasonably happy to have a restriction at work.'

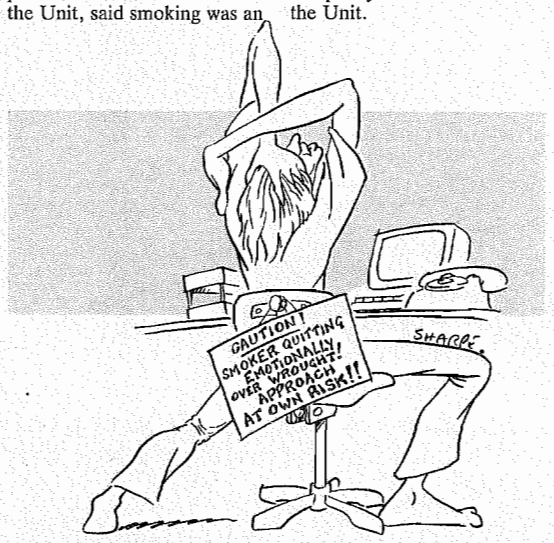
Mr Knobel said staff associations were generally supportive of the move.

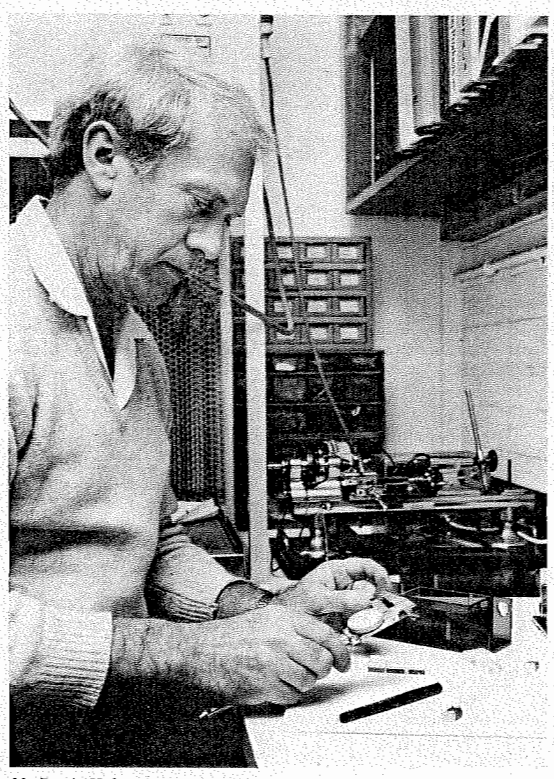
Dr John Graham, the occupational health adviser with the Unit, said smoking was an important health and safety issue.

'The National Health and Medical Research Council reports over the last twelve months have confirmed that passive smoking is a significant health hazard and an unacceptable hazard in the workplace,' Dr Graham said.

The policy was being released now to enable people to adjust to the situation.

Mr Knobel said he advised smokers to try to cut back on smoking at work as soon as possible. A video based on the Federal Department of Health's experience and giving general background on the need for and implications of the policy was available from the Unit.





Mr Barrie Hulse *Photo: Emile Brunoro.*

Churchill fellow

A senior technical officer with the Division of Plant Industry in Canberra, Mr Barrie Hulse, has won a 1988 Churchill Fellowship to spend three months in the United States, Canada and Britain.

Mr Hulse, who has been with the Division for 11 years, is in charge of scientific instrument making and the machine shop. He will visit research institutions, universities and scientific instrument manufacturers during his overseas trip, which will not start until May next year.

He won the coveted fellowship on his third attempt. 'I had been short-listed twice before so that encouraged me to try again,' Mr Hulse said.

The Division will benefit from the fellowship as Mr Hulse expects to pick up some new ideas. 'Sometimes you can get a bit static and if there are better ways of doing something overseas then you should adopt them. But only after you are sure that they work,' he said.

Division Feature

Animal Health

New challenges for an 'old' division

By Trevor Bagust,
Acting Chief

The decision by the CSIRO Board to continue the Division of Animal Health is a vote of confidence in one of CSIRO's oldest divisions.

It also recognises the very significant contributions our animal industries make to Australia's export earnings — and to the national diet.

Reuniting the Australian Animal Health Laboratory (AAHL) at Geelong with this Division has also been proposed by the Board. The primary purpose of the Division of Animal Health, optimising the health and production of Australia's farm livestock, will continue. However, expansion of the Division's role to include exotic as well as endemic animal diseases will follow amalgamation with AAHL.

On the wider front more changes are occurring. Funding for CSIRO research is being shifted from government sources towards a much greater end-user contribution. This trend is already evident in the Division. In the early 1980s we were attracting some 5 per cent of our funding from contributory sources, in 1986/87 it was 24 per cent and for 1987/88 will be 27 per cent or more.

These figures would seem a healthy endorsement of the abilities of the Division's research teams to compete successfully for funding from rural industry, manufacturing industry and biotechnology sources. So far so good, but we are going to need more and more of these funds.

Our present professional expertise encompasses the fields of immunology, parasitology, microbiology, experimental pathology, biological chemistry and epidemiology. These, interfaced with recombinant DNA technology, will doubtless continue to serve us well in the future.

However, the need to capture a steadily increasing proportion of our research funds from contributory sources is going to present new challenges at all levels of the Division.

We are certainly going to need to respond positively and quite quickly to expand our skills in project management and external communications, and to streamline CSIRO administrative procedures, to note just a few areas.

The Division's appropriation funds should continue to be directed towards two priorities. The first is the maintenance of important long-term research that can provide fundamental insights to underpin and further the Division's practical scientific achievements.

The second is the development of promising ideas from the concept stage to where we can assess them realistically on grounds of both scientific and commercial potential.

Then, when commercial agreements are negotiated, we must obtain from our industry partners the necessary funding to see the work through to the required stage of development or commercialisation.

We can expect our progress to be closely monitored by industry collaborators, with more detailed scrutiny and accountability for performance than we have worked with in the past. Hence, project teams will need efficient liaison and reporting mechanisms.

There will be a number of positive aspects to working more closely with industry, but there may also be some potential difficulties. Because of the economic and competitive pressures under which they operate, commercial collaborators will tend to push CSIRO towards shorter timeframes in which to complete research projects.

Considerable judgement will also have to be exercised in selecting the commercial projects to be undertaken, in allocating resources, and in ensuring that full cost-recovery accrues to the Division. Mistakes in these areas will be costly and reduce the program resources available for core research projects.

For staff appointments in the Division, we can also expect the proportion of term-employees to rise significantly. Industry operates on the basis of performance within a finite time scale and their funding of CSIRO employees will reflect this.

I foresee there being a far more commercially oriented CSIRO and a Division of Animal Health in the year 2000. This will not affect our scientific excellence if we respond positively and competitively to these challenges.

Care for animals

Caring for laboratory animals requires special skills — such as understanding the needs of different animal species and how to handle animals without stressing them. Lyn Fox, of the Division's Parkville laboratory shows how it's done.

Animal Health at a glance

Animal Health is one of the original divisions of CSIRO, or CSIR as it was first called, the first Chief being appointed in 1930.

The initials 'CSIR' are still engraved in stone above the entrance to the Division's McMaster Laboratory in the grounds of Sydney University.

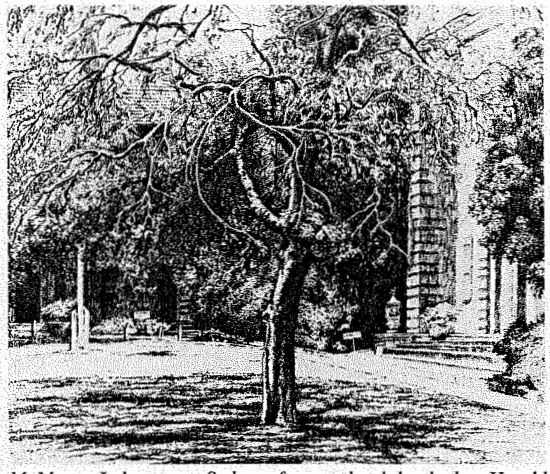
The laboratory was built following a gift to CSIR in 1929 of 20,000 pounds by Mr F.D. (later Sir Frederick) McMaster, of 'Dalkeith', Cassilis, for the construction of suitable buildings for 'scientific research into the problems that were more and more presenting themselves to the pastoralists of Australia'.

The first Officer-in-Charge was Dr (later Sir) Ian Clunies Ross, who in 1949 became the first Chairman of the newly formed CSIRO and consolidated its reputation for excellence in scientific research.

The Division of Animal Health expanded during the early years of CSIRO and then contracted as new divisions were formed and the Organisation turned its attention towards manufacturing and service industries. Nevertheless, the Division has maintained its pre-eminence in the animal health field by attracting increased funding from both rural and manufacturing industry sources.

The present Division of Animal Health has a staff of 180, including 58 scientists, and operates from three laboratory sites with associated field stations:

- Animal Health Research Laboratory, Melbourne;
- McMaster Laboratory, Sydney;
- Pastoral Research Laboratory, Armidale.



McMaster Laboratory, Sydney, from a sketch by the late Harold Whitlock, formerly Senior Technical Officer at the Laboratory.

Since its inception, the Division has directed its research effort towards the control or eradication of the economically important diseases of farm livestock.

There have been some notable successes: the eradication from Australia of pleuropneumonia of cattle; the development of commercial vaccines against black disease, footrot and cheesy gland of sheep and campylobacteriosis of cattle; programs to control blowfly strike and parasitic diseases of sheep, venereal diseases of cattle, and leukosis of poultry; and diagnostic tests which have made a major contribution to the national campaign for eradication of TB and brucellosis of cattle.

But success has been more elusive in some other areas, such as the development of vaccines to protect sheep against worm infection. However, this may change with the increased effort now being put into developing worm vaccines using genetic engineering techniques.

Mastitis of cattle has also been a hard disease to crack. But after a long and difficult research path, a mastitis vaccine was patented recently and is now being evaluated for commercial production.

This feature is designed to present a cross-section of activities at the Division of Animal Health and is not intended as a directory to all services. Call Dr Keith Dash on (02) 660 4411 for more information.

Articles and photographs in this feature have been contributed by Trevor Bagust, Ian Barger, Bob Campbell, John Chiarotto, Claude Culvenor, Keith Dash, Kevin Fahey, Wendy Huntington, Ian Lenane, Len Lloyd, and T.K. Mukkur.

New drugs discovered by chance

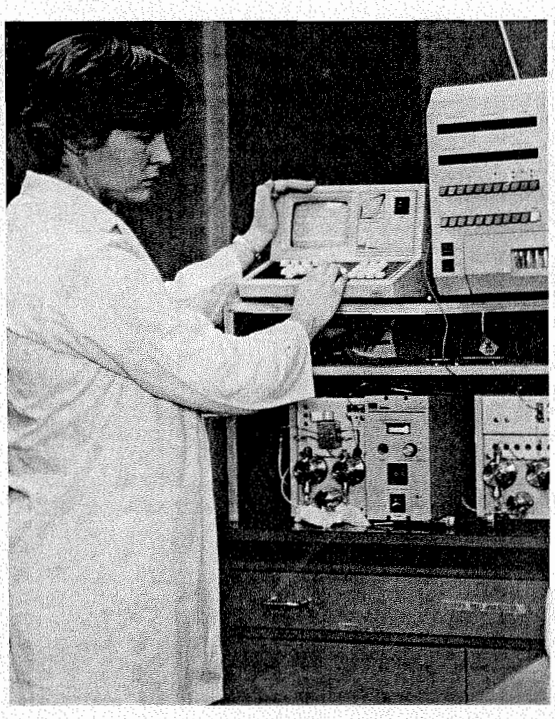
The requirements for registration of new drugs or pesticides for animal use are strict. A new drug must be proved to be safe, effective, relatively free of side effects, and, if used in food animals, tissue residues of the drug and its breakdown products must not exceed minimal levels.

New drugs are often chance discoveries from the screening for biological activity of large numbers of synthetic or natural compounds. It has been estimated that only one compound in every 10,000 screened by pharmaceutical companies is developed through to the commercial marketing stage.

Drug development is a long and expensive process. In fact, for drugs used against worm parasites in animals, it may take six to eight years and can cost $US30 million or more.

Because of this, and the short patent life of new drugs, which limits their potential earnings, pharmaceutical companies are placing emphasis on modifying the chemical structure of existing compounds to increase their potency and on new formulations and delivery systems.

This requires a detailed understanding of how drugs work — that is, their specific mode of action on the parasites or micro-organisms against which they are directed, and the way in which they are absorbed, broken down and excreted by the animal.

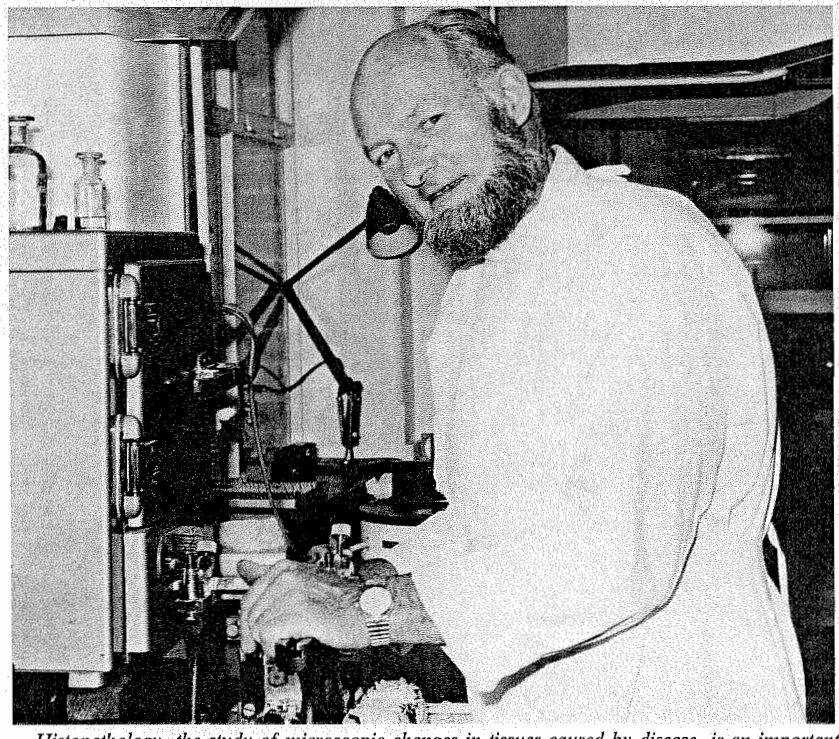


High-performance liquid chromatographic techniques are used to separate and measure metabolites of anti-parasitic drugs in animal body fluids. Here Karen Parsons operates an automated HPLC system at the McMaster Laboratory.

The Division of Animal Health plays a leading role in this field of research, particularly in drugs used against worm parasites of sheep and cattle.

The research has benefited both manufacturers and farmers. For instance, the unravelling of the mode of action of thiabendazole, the first of the benzimidazole group of anti-parasitic drugs, has encouraged the commercial development of later and more potent drugs of this group. It has also led to the development of the intra-ruminal injector, which is now commonly used to administer these drugs to cattle.

Not only can this work lead to the development of better drugs and delivery systems for use by Australian farmers, but it also provides the basis for understanding how parasites develop resistance to drugs.



Histopathology, the study of microscopic changes in tissues caused by disease, is an important part of many research projects in the Division of Animal Health. Here Arthur Rowlatt, Senior Technical Officer at Parkville, cuts thin tissue sections for later staining and examination.

Research priorities

The Division's field of research is well defined and the end users of the results of its research can be easily identified. In these respects it is more fortunate than many other divisions.

Its field of research is the economically important diseases of farm livestock, and its end users, in the main, are livestock producers. State departments of agriculture, farm advisers and manufacturers of animal health products are important intermediaries in reaching these end users.

There is no shortage of disease problems on which to work. The difficulties lie in determining the relative importance of each disease, whether research is likely to produce results with potential to reduce its economic impact, and to what extent this potential can be realised in Australian farming systems.

Advice on research priorities comes from a number of sources: the Australian Agricultural Council, which represents the State and Federal departments of agriculture and primary industries; rural industry research-funding bodies such as the Australian Wool Corporation, the Australian Meat and Livestock Research and Development Corporation, the Australian Dairy Research Committee, the Poultry Research Advisory Committee, and others; farmer organisations such as the National Farmers' Federation and its affiliates; and, closer to home, the Division's Advisory Committee.

Scientists themselves are also an important source of advice on priorities since their research may point to disease problems which are emerging but not yet apparent to the livestock industries.

Drug resistance in worm parasites is a good example. This was identified by the Division's scientists as an emerging problem some ten years before it impacted on the sheep industry. The lead-up work done by the Division has enabled sheep producers to deal with it and slow down its further development.

So the priorities are set and research begins. But progress is often frustratingly slow — it usually means going back to basics to understand the vagaries of the infectious agent, to determine the factors involved in making animals susceptible or resistant to the disease, and then developing and testing control agents and strategies for using them.

However, this is not the end of the research process. No matter how good a research product may be, it will not change the world unless the world knows about it and uses it.

One way in which the Division's research reaches the world is through manufacturing industry. For instance, if the research product is a vaccine it is licensed to a manufacturer, or a consortium of manufacturers, for evaluation and commercial development. Vaccines for footrot and cheesy gland of sheep, and campylobacteriosis, a venereal disease of cattle, have been developed and marketed in this way. A new vaccine for footrot and another for mastitis in cattle are now undergoing commercial evaluation. Sirotech Limited plays a key role in these negotiations with industry.

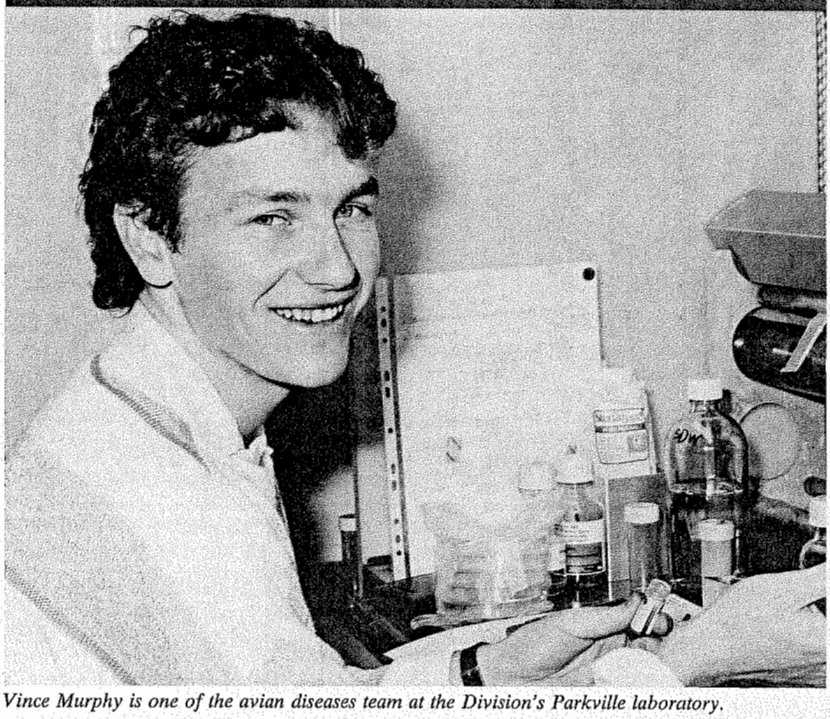
The licensing of CSIRO research products is not the only contact which the Division has with manufacturing industry. Increasingly, the Divisions's expertise is being sought to undertake research, either on a collaborative or contract basis, to develop and test products discovered by industry itself.

The other user groups with which the Division interacts are State departments of agriculture, animal health advisors and farmers.

Communication with these groups is conducted at two levels: at the general level through CSIRO publications such as *Rural Research*, and more directly by way of seminars, workshops and personal contact.

External communication is a serious business for the Division of Animal Health. Here the communications working group plans the Division's program for 1987/88. From left to right, Dr Dennis Watson, Officer-in-Charge, Armidale; Mr John Baistow, Divisional Secretary; Dr Trevor Bagust, Acting Chief; Dr Keith Dash, Communications Co-ordinator; and Dr Peter Waller, Officer-in-Charge, McMaster Laboratory.

Making poultry pay



Vince Murphy is one of the avian diseases team at the Division's Parkville laboratory.

Australia keeps ten million hens for producing eggs and each year we consume 240 million meat chickens. These birds are cared for by about 2000 poultry farmers.

Eggs and chicken meat are amongst the best sources of protein and energy available in our diet. They are also amongst the least expensive foods you can buy. How then does the poultry industry remain profitable working with such low margins?

The costs of poultry production have been kept low by technological improvements which have been applied at a rate far ahead of that in other livestock industries.

The sciences of genetics and nutrition especially have been used to maximise productivity. It now takes less than two kilograms of high-quality feed to produce one kilogram of live finished chicken. Broiler chickens now reach market weight of 2.2 kilograms in just six weeks – that's three weeks less than it was ten years ago!

By combining this technology with optimum husbandry and housing, large commercial poultry farms can budget and produce with a level of predictability and cost-efficiency that is not possible in the other livestock industries.

For the poultry industry predictability means profitability. The major unpredictable factor is disease, which has frequently been a source of disaster. Overseas, poultry producers still suffer from occasional outbreaks of the major plague diseases, Newcastle disease and avian influenza. Australia is free of these two diseases, but we still have other serious problems. For example, laryngotracheitis and Marek's disease can kill 15 to 30 per cent of a farmer's flock within a week of an outbreak.

Apart from the direct losses, production schedules can be completely disrupted by diseases that affect the egg production of layers or the growth of meat chickens. A drop in production as little as 10% can make the industry or individual farmer unprofitable.

Control of disease is a high priority in the poultry industry. In 1973, the Australian Poultry Industries Association requested CSIRO to establish a national reserve of specific pathogen-free (SPF) poultry to service the needs of the industry and to undertake research toward improving the control of infectious poultry diseases.

The Division of Animal Health responded by setting up a high security SPF poultry unit and by developing a major research program on avian diseases.

CSIRO SPF poultry stocks now underpin all poultry vaccines and diagnostics produced in Australia. Other research has been directed towards developing a diagnostic test which has enabled avian leukosis viruses to be controlled towards eradication, improving existing vaccines and developing new vaccines.

Innovative vaccines

Many of the diseases of poultry are caused by viruses or parasites infecting the respiratory or intestinal tract.

Current knowledge indicates that vaccination at the site of natural infection is a good way of protecting chickens against some of these diseases.

The problem is, how do you deliver vaccine antigens to these sites in sufficient quantity and for long enough to stimulate an effective immune response?

The answer is, by using live organisms as delivery vehicles - organisms which have been genetically engineered to produce the appropriate vaccine antigens.

The concept of using recombinant DNA methods to insert genes for vaccine antigens into live viruses, such as the vaccinia virus, is being developed for a number of human diseases, including hepatitis, herpes simplex, rabies and influenza.

Scientists at the Division's Parkville laboratory are exploring the same concept, using chicken-specific viruses, as a means of delivering vaccine antigens to poultry.

Such vaccines should be relatively cheap to produce and could be administered to whole flocks of chickens by aerosol or in drinking water.

A new approach is also being followed by scientists at McMaster Laboratory to develop a vaccine against salmonellosis, a disease which can cause serious illness often associated with severe diarrhoea in sheep, cattle and other animals.

In this case, non-pathogenic mutant strains of Salmonella bacteria are used as vaccines. The mutants survive for only a short time in vaccinated animals – but long enough to stimulate immunity against infection with pathogenic strains of the same bacteria.

Another new approach being developed by scientists at McMaster Laboratory, again using recombinant DNA techniques, is to isolate genes coding for specific antibodies and then to transfer these genes to sheep embryos.

If successful, this feat of genetic engineering will produce sheep which are naturally resistant to disease.

As well as providing a first-rate reference service for scientists, the Division's libraries also handle a wide range of public inquiries. If our librarians can't find the answer from within CSIRO, which is not often, they will usually be able to point to someone outside who can help. Jill Franklin, McMaster Librarian, right, and assistant Penny Morse search for an answer.

Livestock diseases — extinct or endangered

More than a quarter of the people with TB in Victoria in the 1920s and '30s had caught the disease from infected cattle

Strenuous efforts were made to reduce this threat by insisting that milk be pasteurised, which killed the TB organisms, and then by setting out to eliminate the disease from cattle.

Now, after a multi-million dollar campaign that has involved CSIRO, Department of Agriculture animal health officers, meat inspectors and farmers, Australian cattle are almost free of TB and should be totally free in 1992.

Bracketed with TB is brucellosis, a disease of cattle which can also be transmitted to people although it is a less serious disease than TB. It can devastate cattle herds by causing abortion 'storms', which in the dairy industry means that cows are not milking because they have not had a calf, and in the beef industry means fewer calves to rear.

Eradication schemes for TB and brucellosis have been carried out together. The Division of Animal Health's contribution has been to develop sensitive diagnostic tests so that infected animals can be identified.

Right now a new test for TB, based on recent immunological research, is being developed. If successful, it could play a major role in the final phases of the national eradication program. It could also be adapted to diagnose other diseases in both man and animals.

The third epidemic disease where CSIRO research was important in assisting control and eventual eradication was pleuropneumonia of cattle, or 'pleuro' as it was known.

Research scientists at the Division's Parkville laboratory perfected a method of growing the organism, developed diagnostic tests and an effective vaccine. Research on the disease started in 1930 and Australia was declared free of 'pleuro' in 1973. Eradication led to the development of the live cattle export trade which in one year alone, 1986, was worth $46 million.

Meanwhile, back on the farm ...

It may seem unusual that the Division of Animal Health, which is concerned with diseases of farm animals, should have its largest laboratories in Sydney and Melbourne, quite remote from the major centres of livestock production.

The reason for this, apart from the cost of re-locating the Division to a country area, is that the pharmaceutical companies, manufacturers of animal vaccines and biotechnology research institutes with which the Division collaborates are all located in the capital cities.

But this does not mean that the Division isolates itself from the 'real world' of rural Australia. An active research group is maintained at the Division of Animal Production's Pastoral Research Laboratory in northern NSW and the Sydney and Melbourne laboratories have field stations in near-city rural areas.

Life is different down on the farm. For a start, it is more egalitarian than in the traditional CSIRO laboratory because everyone is expected to pitch-in when there's paddock work to be done. You don't see many scientists or technicians in white coats — usually they're dressed in overalls and boots.

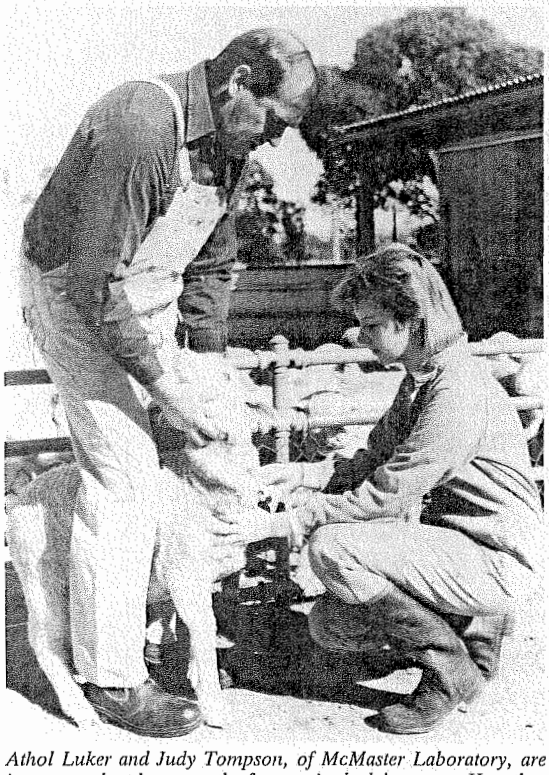
In addition to the normal laboratory-based research skills, these people have to learn farming skills as well. Such as how to strain a fence, hang a gate, mend water troughs, dig out bogged vehicles and train a sheep dog (or, failing this, to run and bark like one).

The ability to run fast has other advantages. For instance, it can help keep you out of trouble when you are weighing a new-born calf and are being harassed by a stroppy mother.

Knock-about style.

It's easy to pick the 'bushies' in a mixed group of CSIRO people. The real giveaway is their knock-about style, which is the bane of chiefs and program leaders. They do not display the same unquestioning deference to their superiors as do others in CSIRO and they haven't lost the capacity to laugh at themselves (or at others, for that matter). Their attitude seems to be that even though life may be serious, it doesn't have to be miserable.

Many of the technicians and farm staff on the field stations come from farming backgrounds. Their experience helps to keep the Division's research on the rails and is invaluable when it comes to designing communication strategies to translate the results of research into farming practice.



Athol Luker and Judy Tompson, of McMaster Laboratory, are just as much at home on the farm as in the laboratory. Here they are taking a blood sample from a lamb to test its response to vaccination against worm parasites.

If you've ever wondered what the cheerful voiced people who welcome you to the Division of Animal Health look like, well here they are. From left to right: Jack Bradley, Animal Health Laboratory, Melbourne; Lynda Gorrie, McMaster Laboratory, Sydney; and Debbie White, Pastoral Research Laboratory, Armidale.

Self-sacrifice in the sun

The contributions of CSIRO's Division of Animal Health to low-cost and efficient animal production in Australia are well known.

Until recently, however, the only truly international aspect of the Division was its reputation for the excellence of its research.

Now, thanks to funding by ACIAR (Australian Centre for International Agricultural Research) and ADAB (Australian Development Assistance Bureau), the Division's expertise is being made available to solve problems in Sri Lanka, China and the Pacific Islands.

When countries such as Fiji, Vanuatu, Tonga and Western Samoa tried to increase local production of sheep and goat meat to save the cost of expensive imports, they soon found they were losing up to half their newly expanded flocks and herds each year.

Local veterinary authorities discovered that the prime culprits were two species of worm parasites, barber's pole worm and black scour worm. The only remedy seemed to be monthly treatment of all stock with expensive imported drugs.

This treatment regime soon led to an even greater problem — the worms evolved resistance to the drugs. ACIAR was asked to help, and naturally approached the Division of Animal Health with its world-class stable of parasitologists.

Barber's pole and black scour worms were once widespread on the Northern Tablelands of NSW before the Division's Armidale laboratory devised its highly successful WORMKILL program.

The parasitologists at Armidale didn't hesitate. In a remarkable display of altruism and selfless dedication, they forsook the invigorating New England winters for the sheer hell of the palm-fringed beaches of the South Pacific.

Project Leader Dr Leo Le Jambre left almost immediately on a fact-finding mission and for consultations with veterinary authorities. As a result, epidemiologist Dr David Banks was appointed and stationed in Fiji to run the project under the general direction of Dr Le Jambre and Dr Niumaia Tabunakawai, of the Fijian Ministry of Primary Industries.

Even more self-sacrifice was to follow. Mr Ian Barger, an experienced epidemiologist from the Division's Armidale laboratory, gave two weeks of his time to assist Dr Banks in selecting suitable experimental sites in Fiji and in planning experimental protocols for the first year of the project.

Finally, Mr Tony Lisle, Senior Technical Officer in Ian Barger's research group, spent nearly four weeks updating the parasitological skills of technical staff in the Suva laboratory. Tony's sacrifice was even more remarkable in that he missed out on May in Armidale, traditionally the height of the wood-chopping season.

Experimental work has been underway in Fiji for almost a year now and already promises to make a highly significant contribution to world knowledge on the epidemiology and control of worm diseases of goats and sheep in the wet tropics.

One wearisome hazard has faced all Australian contributors to the project over and above the normal rigours of adjusting to life in the sun in the South Pacific. Their colleagues in Armidale and Sydney refuse to believe that worms in goats are the inspiration for so much enthusiasm, and refer to the study as the 'Pink Gin Project'.

Plants pose hidden dangers

There is no more idyllic scene for a sheep or cattle farmer than contented animals grazing lush green pastures. But sometimes there are hidden dangers.

Many plants, including some valued pasture and fodder species, contain toxic substances — either produced by the plants themselves or by bacteria and fungi growing on them. Protecting animals from disease caused by these toxins can be very difficult. One way is to breed animals which are resistant to the toxin and another is to breed pasture plants which produce less toxin or are resistant to bacterial or fungal infection. But both methods are long and costly.

Only rarely have effective animal treatments been developed — such as the use of cobalt oxide pellets to prevent Phalaris poisoning and rumen organisms to degrade the toxin produced by Leucaena.

These examples, both developed by CSIRO, have inspired scientists in the Division of Animal Health to look for new methods to prevent plant-poisoning diseases.

One approach, directed first at annual ryegrass toxicity (ARGT), is to design and synthesise a chemical which will intercept the toxin in the rumen, bind it tightly and prevent its absorption. In the hands of Dr Jeff Gosper, this work employs the computer-aided design methods now prominent in the development of pharmaceuticals and pesticides.

The other approach, guided by Dr John Edgar, is looking to genetically engineer rumen organisms so they can degrade specific toxins. Again ARGT is being used as the test system. Organisms capable of degrading the toxins which cause ARGT have been collected and their metabolic processes are now being explored.

If these high-tech methods live up to expectations, other recalcitrant poisoning diseases can be attacked with confidence in their ultimate control.

Matter of opinion

Scientists at AAHL have had their confidence in rural journalists shaken by two outbreaks of the deadly disease 'beat-up' in recent weeks. 'Beat-up' results from the escape of facts from a news story and their replacement with virulent terms such as 'almost devastated', 'secret tests', and 'vital security measures'.

Stories affected by 'beat-up' swell to several times their normal size and appear considerably more exciting than they really are. Unpleasant side effects include loss of confidence and increased anxiety among people swallowing the stories whole, and this has proved exceptionally difficult to treat.

The recent outbreaks of 'beat-up' have been characterised by cover-up attempts in which journalists have failed to notify the Laboratory that they were handling these dangerous stories, and that the facts had been allowed to escape. Further, there has been no consultation with the livestock industry as to whether its members approve the introduction of the virulent terms.

Inquiries into the latest of the affected stories were carried out by three independent television news crews. These inquiries revealed that the absence of the facts was so essential to the story's news-worthiness that none of the stations was able to run it once they had been reinserted.

This is hardly surprising. Few people are likely to get excited about AAHL handling a bacterium which is also held in at least half a dozen other labs around the country. That a scientist accidently pricks his finger and develops a reaction to the agent also loses all its glamour if there is absolutely no danger of his passing it on to any person or animal. No one is even vaguely interested in lack of consultation with the livestock industry once they realise that it isn't AAHL's responsibility to consult.

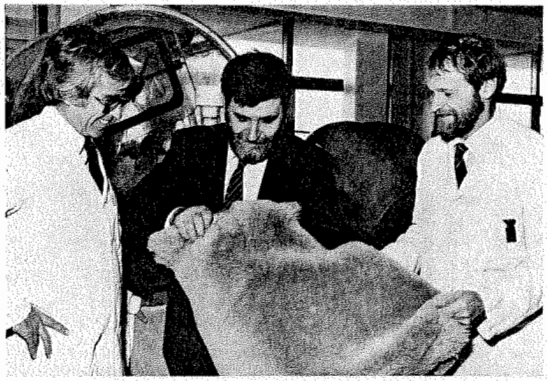
Similar problems of sensationalism winning out over scientific fact were seen in the coverage of the Newcastle disease virus spill at AAHL. The incident showed up deficiencies in the operation of the Laboratory and is being taken very seriously indeed by everyone here. The recommendations of the independent review into the incident are being implemented as rapidly and thoroughly as possible, and we are all well aware of the damage it has done to our credibility and to our future operations.

However, much of this damage resulted from sensationalised press coverage which insisted that virus had 'escaped' from the Laboratory and 'almost devastated' the poultry industry. The virus did not 'escape'. Its leaving the Laboratory was the result of a carefully considered, and scientifically correct, decision based on a significant volume of literature which indicates that the virus cannot be passed on from an infected person.

To describe the total lack of impact on the poultry industry as 'almost devastation' is clearly nonsense, and brings no credit on the person who thought up the term, or on those who mindlessly repeated it.

The effects of such classic cases of 'beat up' on AAHL's precarious balance among the politics of the livestock industry are considerable and largely irreversible. While we struggle to regain that balance, Australia is exposed to the risk of facing a real exotic disease outbreak unprepared. Is that really a sensible price to pay for sensation with the cereal?

Kath Perry
Information Officer
AAHL



The Federal Minister for Science and Small Business, Mr Barry Jones, recently visited the Division of Protein Chemistry. He is pictured examining a tanned sheepskin produced using the 'Siroskin' process, developed by researchers in the hides, skins and leather program to facilitate rapid processing and reduce felting in fine-woolled merino skins. Dr Neil Evans, left, and Dr Peter Gordon, are with Mr Jones.

Life in the tropics

This year's ANZAAS Congress will be held at the James Cook University, Townsville, on 24-28 August.

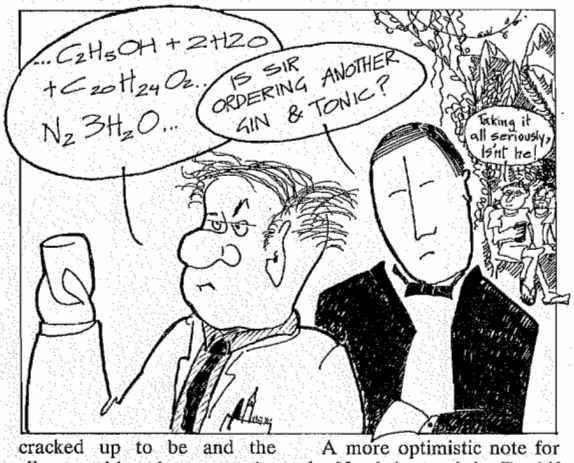
If the venue is any indication, delegates to the 57th ANZAAS Congress could be imbued with a slightly rose-tinted view of 'Science and Life in the Tropics' - the theme for the meeting.

Townsville offers the prospect of more hours sunshine than any other Australian city, plus easy access to beaches, reefs and rainforests. Delegates are being further lured by the tantalising prospect of 'tropical formal', alfresco receptions and pre- and post-congress tours to nearby idyllic environs.

But there will, of course, be a more serious side to the program, with Australian and overseas speakers addressing a wide variety of topics.

CSIRO will be well represented on subjects ranging from tick venom toxicology to the threat of alien vegetation hanging over Kakadu National Park.

A paper by Townsville-based Dr Ray Isbell and Dr John Williams, will show the north is not quite the cornucopia of agricultural potential that some may think. The soils aren't all they've been cracked up to be and the climate, although commendable from the point of view of winter holiday-makers, poses greater risks to the would-be farmer than are encountered in many other tropical parts of the world.



In the Far North alien vegetation is creating headaches for those concerned with both agricultural development and conservation of natural fauna and flora. Dr Mark Lonsdale and Dr Dick Braithwaite, of CSIRO's Darwin laboratory, will be talking about the threat posed by an exotic prickly shrub which has already engulfed 45,000 ha of unique wetland.

A more optimistic note for the North is struck by Dr Alf Ekstrom, of Energy Chemistry, who suggests Queensland's oil shales may play a valuable role in cushioning the future energy shock that awaits Australia.

Altogether, over 30 people from CSIRO are due to present papers at ANZAAS. For further information about how to get to hear them and other erudite speakers (and, of course, soak up some of the Sunshine State's most touted natural resource) contact: The Organising Secretary, ANZAAS Congress, James Cook University, Townsville Qld 4811. Telephone: (077) 81 4111.

Program for staff

A Performance Review and Development Program is planned for introduction throughout CSIRO within the next two months.

The program is now being finalised for implementation. It has been developed by a working group consisting of the Chief of the Division of Tropical Crops and Pastures, Dr Ted Henzell, the Chief of the Division of Mineral Engineering, Dr Robin Batterham, the Chief of the Division of Chemical and Wood Technology, Dr Warren Hewertson, and the General Manager (Personnel), Mr Kevin Thrift.

The main objective will be to enhance job satisfaction, morale and performance. The program will formalise arrangements which have been in use in a number of divisions in recent years.

The program has been under development for almost a year. It has been discussed with staff associations and the Consultative Council.

Details of the program will be revealed in next month's *CoResearch*.

SIROCREDIT

Welcome to our new Topics of Interest column. A column which will briefly outline news from the CSIRO Co-Operative Credit Society Ltd (SIROCREDIT) of importance to all CSIRO staff right around Australia. Already staff would be accustomed to the Topics of Interest posters and leaflets which are seen throughout CSIRO. Hopefully this column will form an integral part of the communication between member and credit union.

The Board of the CSIRO Co-operative Credit Society (SIROCREDIT) are pleased to announce the appointment of the new General Manager Mr A.E. (Eddie) Sanfilippo. Mr Sanfilippo, who previously held the position of Assistant General Manager of Education Credit Union Co-operative Ltd, is a past Director of Massey Ferguson. With more than eleven years banking experience he is well equipped for his challenge with SIROCREDIT. In addition to his working experience, Mr Sanfilippo holds a Bachelor of Business, Diploma in Banking and Finance and is a certified practising accountant.

Mr Sanfilippo has already set his sites on making SIROCREDIT THE banking institution for ALL CSIRO staff and their families.

S.A. Hubbard
SIROCREDIT

Signal processing

An international symposium on signal processing and its applications will be held in Brisbane from August 24 to 28.

The symposium will be the first in Australia devoted exclusively to signal processing. It aims to provide a forum whereby industrialists, researchers, engineers and technicians may discuss the objectives and applications of signal processing.

More than 300 people are expected to attend and delegates and speakers from 35 countries will be involved.

For further information contact UniQuest Ltd, University of Queensland, St Lucia, Queensland 4067. Telephone: (07) 377 2733.

Grants Scheme goes

The Communication Grants Scheme, established in 1985 to encourage divisional communication efforts, has been suspended for the 1987–88 financial year.

Divisional communicators have expressed strong disappointment at the decision. The grants would have been worth $300,000 this year.

In a letter to Chiefs, the Director of the Bureau of Information and Public Communication, Mr Peter Dunstan, said a large number of funding requests had been received.

'I regret to advise that, following the Treasurer's May economic statement, the Chief Executive has been forced to rule that, in the new circumstances, the allocation cannot be confirmed,' Mr Dunstan said.

Communication Co-ordinator with the Division of Forest Research, Ms Wendy Parsons, said the grants had been effective in stimulating innovative communication strategies and in raising the morale of both scientists and communicators. 'This decision is a morale-killer', she said. 'As an organisation we should hang our heads in shame at this ill-timed decision'.

Ms Jennifer Pringle-Jones, Communications Officer for the Marine Laboratories, said the grants had enabled divisions to undertake projects that would often have been impossible without this support. The scheme had encouraged divisions to make a positive contribution to communication activities.

Mr Peter Martin, of the Division of Water Resources Research, said the grants were proving a 'highly effective way of gaining recognition at divisional level that communication problems could be systematically tackled'. This recognition at a divisional level was urgently needed if CSIRO was to 'solve its chronic communication problems'.

Other communication officers expressed similar views.

The grants have been awarded in the past on a one-for-one basis for open days, the production of videos and information booklets and other communication activities.

DITAC Seminar

A seminar on interaction between tertiary institutions and industry will be held in Melbourne on Wednesday 2 September 1987.

The seminar, which is sponsored by the Department of Industry, Technology and Commerce, will discuss commercialising research and government policies and programs. It will be held at Cosser Hall, Victorian College of Pharmacy Limited, 381 Royal Parade, Parkville, from 1pm to 5pm. For further information contact Elizabeth Andrews on (03) 665 6292.

Biochemistry award

Dr Peter Hudson, of the Division of Protein Chemistry, has won the Australian Biochemical Society's 1987 Boehringer–Mannheim Medal.

The medal is awarded annually to a biochemist aged under 36 years for excellence in research.

Dr Hudson's work with the Division has involved collaboration on the cloning of the infectious bursal disease genome and the production of a genetically engineered subunit vaccine.

Recently Dr Hudson has been successful in obtaining, with Dr Colin Ward, a substantial grant from Biota Holdings Ltd to initiate a recombinant DNA project to produce influenza viral vaccines.

Dr Hudson, left, receives the Boehringer-Mannheim Medal from Professor Gerry Wake, the President of the Australian Biochemical Society.

Health matters

Legionnaires' disease

The recent outbreak of Legionnaire's disease in Wollongong has prompted many requests from divisions and staff for information and an assessment of the risk of an outbreak within their working environments.

The bacterium *Legionella pneumophila*, which causes Legionnaire's disease, has three properties which provide the key to its control. Firstly, it is widely distributed at low levels of concentration in dust, soil and natural water sources.

Secondly, it is very difficult to kill and can remain viable for many years although it needs very specialised conditions to reach dangerous levels. It requires the presence of water at an optimum temperature range of 25 to 45 degrees celsius, a suitable habitat (such as scale or algae) and nutrients, including the amino acid cysteine and iron, in a form which it can metabolise. These conditions are found in many water systems.

Thirdly, *L. pneumophila* will only cause disease when it enters the lung as an airborne bacterium - generally contained in finely divided water droplets as an aerosol.

From this simplified aetiology it is apparent that prevention of the disease depends on a two-pronged approach - prevention of the conditions under which the concentration of the bacterium can rise to unsafe levels, and prevention of the bacterium becoming airborne and being inhaled.

Within the wide range of CSIRO research activity and the climatic conditions under which it is carried out there are a number of potential breeding grounds where dangerous levels of the bacterium could develop. These include:

- humidifiers in airconditioning systems or glasshouses;
- cooling towers;
- automatic watering systems in biological research;
- aqueous solar heat banks;
- some domestic installations, including showers;
- some types of evaporative coolers.

While the bulk of our airconditioning units and fixed plant items as listed above are regularly cleaned and chemically treated under contract arrangements, there are other items of plant and experimental rigs where the conditions exist which are conducive to growth of the bacterium. It is up to the staff concerned to initiate preventive action in these situations.

Advice on treatment of water systems and selection of appropriate equipment (for example, steam humidifiers in lieu of water spray types) has been provided to divisional engineers and safety officers. Regional offices of the Department of Housing and Construction can also advise.

While the risk of a serious outbreak appears small, the consequences could be very serious. Prevention is relatively easy, cure is not.

Why report health and safety incidents?

The issue of new OHS incident forms and reporting procedures (Policy Circular 87/12) has resulted in several staff asking 'why do we need to report incidents which result in minor injury or no injury at all?' Indeed some staff are reluctant to report 'near misses', not only through apathy but because of concern that they will be criticised by their supervisors for being clumsy or negligent.

There are three main reasons why the OHS Unit and your local management need to know about all OHS incidents.

Firstly, OHS prevention programs are generally developed on the basis of an existing problem. Quite often the early evidence of that problem is a series of 'near miss' or sub-acute effects. Accident statistics generally show that for every workplace fatality there may be 30 serious injuries, 300 minor injuries and 3000 near misses or minor events.

Secondly, it is important, both for individual staff and the Organisation, that relevant facts surrounding any incident be recorded at the time. Often there is a need to refer back to that incident some time later during subsequent compensation or common law claims. Lack of recorded details makes the task of all relevant parties a difficult one — memories dim, staff retire or move on.

Even if the detail of only one in a hundred minor events is ever needed subsequently then there is some justification for its collection. The cut finger, chemical spill or minor back pain experienced today could go on to become a more serious health problem in the future.

Finally, incidents need to be reported so that local management and OHS committees can do something about them. How often do we see situations where individual staff members or whole work groups complain that 'they' (management) should do something to fix a certain OHS problem.

I think it fair to say that in many cases 'they' have not been alerted to the problem or at least not at a sufficiently high level to result in some positive action. The incident reporting system can help to bring OHS matters to the attention of management and OHS committees.

It is in everybody's interest if you fill in an 'occupational injury illness or incident report' form (CS/S8/3) next time something occurs which endangers your health and safety.

First full-time site OHS officer appointed

Mr John Carlton has taken up the first full-time OHS post in the Organisation. He will be responsible to the divisions of Plant Industry and Entomology at Black Mountain, ACT.

The appointment is the first of a series of such positions to be created at the larger divisional and shared sites within the Organisation. Before joining CSIRO, John worked for many years in safety at the Australian National University both in the Research School of Physical Sciences and the university's OHS unit.

Gary Knobel
Manager, OHS

Maths-in-Industry study group

The fourth Mathematics-in-Industry study group will be held at the University of New South Wales from February 1 to 5 next year.

Researchers or technical managers in industry are now invited to propose scientific problems for consideration.

The Division of Mathematics and Statistics is the major sponsor of the group and the principal co-sponsor is the industrial mathematics and statistics group of the University of NSW.

The study group aims to: provide Australian industry with high level mathematical advice on challenging scientific problems; stimulate greater awareness in industry of the need for and role of mathematics; establish better links between industry and mathematicians; expand employment prospects for mathematics graduates; provide a fresh source of important research problems for mathematicians; and develop improved collaboration roles for the Division and the industrial mathematics and statistics group.

For further information contact Dr N.G. Barton, Division of Mathematics and Statistics, PO Box 218, Lindfield, NSW 2070. Telephone: (02) 467 6702, 467 6062

CoResearch
CSIRO's staff newspaper
No. 305 September '87

All staff to set work objectives

Performance reviews to start

A Performance Review and Development Program involving all of CSIRO's more than 7000 staff will be introduced over the next two months.

The program, which has been under development for almost a year, will involve annual performance reviews and goal setting by all officers in conjunction with their supervisors.

The Chairman of the working group set up to develop the program, Dr Ted Henzell, Chief of the Division of Tropical Crops and Pastures, said the scheme would bring important benefits to both staff and management.

'This is a very significant step towards improving management processes within CSIRO,' he said. 'I believe it draws on the best of similar schemes in use in private enterprise but it also draws upon programs already used in some divisions.'

The working group consisted of Dr Henzell, Dr Robin Batterham, Chief of the Division of Mineral Engineering; Dr Warren Hewertson, Chief of the Division of Chemical and Wood Technology; and Mr Kevin Thrift, General Manager (Personnel).

Dr Henzell said the program aimed to enhance job satisfaction, morale and productivity.

It was based on:

- ensuring that all officers and their supervisors had a mutual understanding of job objectives and a way of assessing how well those objectives were met;
- encouraging officers and supervisors to communicate regularly and openly.

Under the program a formal review session would be held each year.

At that session, officers would assess how well they had worked in the previous 12 months in achieving the objectives set in the last review, Dr Henzell said.

With their supervisors they would explore ways of performing even better, perhaps through further training and development, and consider issues like the possible need for a change in career direction. Officers would also negotiate a set of objectives for the next 12 months.

Dr Henzell said these objectives could be adjusted at any time during the year if the officer and the supervisor agreed that it was appropriate.

All officers would fill in a review form on which all relevant details of performance, objectives and training needs would be recorded. The form, which would be the same for all staff, also contained space for supervisors' comments.

Dr Henzell said the review forms would be stored securely on a confidential file separate from the individual's personal history file.

'The Organisation has guaranteed that the review forms will be kept quite separate from documentation used in the extremely unusual event of formal disciplinary or inefficiency action,' he said.

'This program aims to improve performance no matter how good or poor it is, not to punish poor performance.'

Dr Henzell said that if an officer believed a supervisor could not carry out the review process objectively, a more senior officer should be contacted for advice.

The program provides for the first reviews to be completed throughout the Organisation by November.

All staff would have the opportunity to see a video setting out the process and would be given training on how to set their objectives.

'There are many similar schemes in operation around Australia and overseas. It is clear that when people are committed to these schemes there are great benefits for staff and management,' Dr Henzell said.

Dr Henzell said the new process would also have the benefit of standardising procedures across the Organisation and staff would no longer find a different set of arrangements whenever they changed Divisions.

'I hope all officers will give this program their full support,' he said. 'It already has the full support of Dr Boardman (Chief Executive) and the Management Committee.

'It should make all officers feel more involved in the planning of their careers and in the setting of their work goals. The better communication involved can only benefit everyone.'

Contact officers, who will have an active role in the implementation of the program, are being nominated for each Division and Unit.

Set apart before the race

As the sails unfurl from the majestic square riggers at the start of the tall ships race from Hobart to Sydney next year, Hobart yachtsman Hans van der Doe will know that he has already achieved distinction in the race.

Mr van der Doe, the marine superintendant at the Marine Laboratories, will race the sloop Aquarella, which at 30 feet long at the waterline will be the smallest competitor.

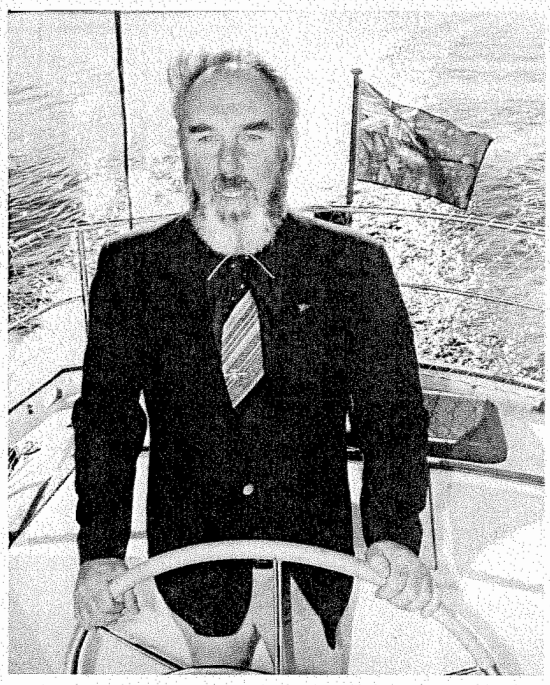
The tall ships race ends in Sydney on 20 January 1988, but the yachts taking part will be a feature of the Australia Day celebrations when they will join the ships of the first fleet re-enactment to sail into the harbour.

Mr van der Doe said some 200 yachts would take part in the race, which has categories for square riggers, smaller tall ships and ordinary yachts.

He is seeking sponsorship to assist him in training his young crew members and equipping Aquarella with extra safety equipment and sails.

The crew, three males and three females, is already in training and will take part in the coming Bruny Island, Maria Island and Mewstone Rock races.

The five-year-old Aquarella is normally used for cruising and racing in southern waters.



Mr van der Doe at the wheel of the Aquarella.

Photo: Thor Carter

Science spectacular

A fascinating voyage through outer and inner space will be one of the highlights of a CSIRO science spectacular at this year's Royal Melbourne Show.

As guest exhibitor at the show, CSIRO has put together a display occupying one and a half floors.

If you've ever wished that you could be aboard a spacecraft and look back on Earth or that you could shrink to the size of a pin head and could view the world from there, a visit to the 'Adventures with Science' display is a must.

Billed as the 'biggest scientific hit in Australia since Skylab', it's guaranteed to dazzle both young and old alike.

But young people will find it especially attractive. And, for the first time in the history of the show, much of it will fall during Melbourne school holidays.

The show will be held from 17–26 September.

The exhibit will feature numerous activities including 'hands on' experiments, demonstrations, videos, information booths as well as eight special performances a day by well-known national television personality, Deane Hutton, of 'Curiosity Show' fame.

There will be a number of 'theme' exhibits including 'Fun with Science' and 'Worlds of Science'.

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From the Chief Executive

A column by Dr Keith Boardman

The debate on the proposed changes to the structure of the Organisation during June and July diverted attention from the cuts in CSIRO's appropriation funds for 1987/88, determined in the May mini-Budget. Although the final appropriation for CSIRO is not known at the time of writing this column, I am very optimistic that we will not suffer further cuts, even though it is apparent there will be further reductions in government expenditure in the September Budget.

Leaving aside the $5 million reduction to be offset by the sale of assets, the Organisation (Institutes and Corporate Services) has a reduction of $11.7 million (or 4.5 per cent of ongoing estimates) made up of $3.7 million for a Government-imposed efficiency dividend across the public sector, $5 million from the mini-Budget and $3 million to cover the costs of the Early Separation Incentives Scheme in 1987/88. The Minister attempted unsuccessfully to have the efficiency dividend for CSIRO restricted to corporate services and administration. He argued that all nations are increasing the efficiency of their R & D with the use of sophisticated equipment, and that Australia is in danger of falling further behind our competitors.

In addition to the above reductions, the Organisation has ongoing commitments of $4 million for the build-up of the Division of Information Technology, the Manufacturing Industry Collaboration Program and the full year costs of growth area allocations in 1986/87.

It appears that most divisions will be facing reductions of 6 per cent in their appropriation funds. Responses from several divisions indicate that a reduction of this order can only be achieved with a substantial reduction in their discretionary operating funds. This would be disastrous to the effective use of our research resources, and I believe that the Organisation has no alternative but to increase its outside funding to offset these reductions.

In 1986/87, the rural industry research funds provided $22.3 million of the $53 million of outside research funds, while the contribution from Australian companies amounted to $9.5 million. There is much scope for the Organisation to substantially increase its funding from companies, particularly at a time when private sector R & D is increasing significantly. Figures from the Australian Bureau of Statistics show business R & D increasing from 0.24 per cent of Gross Domestic Product in 1981/82 to 0.34 per cent in 1984/85. It is expected that there will be a further increase of 50 per cent in 1987/88. There is still a long way to go, however, if Australian companies are to compete internationally, particularly in the high technology areas.

The formation of the Management Investment Companies and the 150 per cent tax incentive have promoted a substantial increase in the sources of venture capital for R & D. Some of these sources are interested in funding research which is high risk, but with potential high return. I believe that venture capital R & D funds can be beneficial to CSIRO and the nation by permitting an increase of research in approved research institutes and enhancing prospects for subsequent commercial success. The sources of funds are particularly valuable for exploiting research in areas which have the potential to lead to the creation or expansion of new industries.

I have established a working party from CSIRO and Sirotech to examine the scope and opportunities for CSIRO to assess the venture capital market.

The offsets obligations of foreign companies also offer additional opportunities for CSIRO to expand its strategic research and at the same time gain access for emerging technologies in those companies.

A Keith Boardman

Marine lab displays

The Marine Laboratories and career opportunities in CSIRO were the subjects of a display mounted in Hobart to coincide with the launch of *Poppy*, a magazine for girls in Year 8 at school.

The publication, produced by Tasmania's Advisory Committee for the Education of Women and Girls, aims to create greater awareness of the full range of careers available to women, including jobs previously regarded as 'male-only occupations'.

The display was staffed by Oceanography personnel officer, Ms Pam Powell, the communications officer , Ms Jennifer Pringle-Jones, and graphic artist Ms Brita Hansen.

Meanwhile, plans are in hand for a major Marine Laboratories promotion to be staged in December and January.

Featuring banners with line drawings of research vessels used in marine science during the last 60 years, plus memorabilia ranging from whaleguns to hatbands, it has been timed for a period when the port area of Hobart will be particularly busy because of the Sydney to Hobart yacht races and the tall ships race from Hobart to Sydney.

Personnel Officer Pam Powell, of the Division of Oceanography, talks with two Geilston Bay High School students about CSIRO careers. *Photo: Thor Carter.*

The Marine Laboratories occupy a prime site on the Hobart waterfront and it is hoped that thousands of visitors — as well as locals — will see the maritime exhibition in the Laboratories' foyer.

If any people from other divisions have items that might be suitable for display — especially if they relate to fisheries or oceanographic research — Jennifer Pringle-Jones would like to know about them. She can be contacted at the Marine Laboratories, Castray Esplanade, Hobart, 7000, or telephone (002) 206268.

Earlier this year, another foyer exhibition linked the history of the Divisions of Fisheries and Oceanography with the history of the Laboratories' site. This was staged in conjunction with National Heritage Week, organised by the National Trust, and aroused considerable community interest.

Building Research surveys towns

They sprang up where no town should rightly be; in the deserts, the forests, and in the mountains. Mining towns, the prefabricated communities which dot the remote areas of Australia, are there for one reason — to shelter and support the workers who dig and drill.

But mining towns are made up of real people — wives, children, retailers, support staff — who have their own individual wants, needs and problems; things that have to be adequately provided for in an artificial, pre-planned, prefabricated community.

The Division of Building Research has just completed a major survey of community attitudes in both mining towns and rural centres associated with mining to enable resource companies, government bodies, and local councils to provide a better lifestyle for their people.

The survey involved interviews with up to 200 local people in each of 17 such towns around Australia. The towns were Karratha, Parabudoo, Tom Price, Headland, Dampier, and Wickham in Western Australia; Savage River, Waratah, Roseberry, Zeehan, and Queenstown in Tasmania; and Moura, Emerald, Blackwater, Moranbah, Dysart, and Bilcolla in Queensland.

Responses to the survey covered such topics as past residential experience, future planned residence, reasons for locating to and from mining towns, adequacy of local facilities, housing needs, attitudes to mining companies, social problems including alcoholism and lack of recreation facilities, and job satisfaction.

Results varied widely from town to town, but showed that life in mining towns has its problems as well as its advantages.

For example:

- About 65 per cent believed that alcohol caused serious problems in their town.
- In nearly all of the towns, between 40 per cent and 60 per cent of men felt that there was too much preoccupation with money matters.
- Perhaps surprisingly, in seven of the towns, less than 10 per cent believed that the town was not a good place to bring up children.
- The study revealed that there were no higher levels of mental health problems compared with other urban centres for which comparative data is available.

The information obtained through the CSIRO survey has been compiled on a computer database.

Order desk pads now

The Printing Centre will be producing 1988 desk pads for distribution by early December to all divisions.

The pads will be provided to chiefs and divisional editors or information officers. Extra pads will be available for $6 each plus freight charges. The minimum order is five.

Divisions or units can have their name, address and telephone number printed on the pads for a one-off cost of $40. The minimum order is 20 at $6 each plus freight. Orders over 20 will reduce costs accordingly to as low as $4.

Orders for standard and special overprinting must be received by 22 October. For further information contact Wayne Matthews, CSIRO Printing Centre, (03) 418 7333.

Video on changes

The Film and Video Centre has produced a special edition of *Connections* on the reorganisation of CSIRO.

In a 20-minute interview the Chief Executive, Dr Boardman, discusses the issues involved in the changes and how he sees the future of the Organisation.

Anyone who has missed seeing the video should contact the communications taskforce contact person in their Division.

Animal care council

A new advisory council on the care of animals used in research and teaching has been formed to encourage self-regulation and communication.

CSIRO, the Australian Vice-Chancellors' Committee and the National Health and Medical Research Council are the major contributors to the organisation at this stage, which will appoint its first part-time executive officer soon.

The Australian Council for the Care of Animals in Research and Teaching (ACCART) is a national organisation involving groups which use animals for research or teaching and representatives of State and Federal bodies involved in the regulation of animal use.

The council's chairman, Professor Alec Lazenby, who is the Vice-Chancellor of the University of Tasmania, said the council was a fully autonomous, independent body which would promote self-regulation among its member organisations, provide information on optimum standards of animal care and encourage communication between member organisations, government and animal welfare groups.

'It is purely an advisory body and will not in any way usurp the regulatory or administrative responsibilities of State and Federal authorities,' Professor Lazenby said.

Organisers hope ACCART will be a constructive mechanism for approaching animal research and teaching issues on a national basis and will facilitate resolution of potential conflicts.

Its formation results from increased awareness within the research and teaching community of the distinctive issues that relate to the care and use of animals in research and teaching.

One of ACCART's most important services will be an information resource unit. Professor Lazenby said this unit would:

- develop a comprehensive data base covering all aspects of animal-based research including ethical, scientific and technological information;
- establish a listing of species of animals available in Australia;
- develop a register of people and organisations with expertise and facilities relating to animal research;
- establish a comprehensive library;
- produce newsletters, technical bulletins and educational audio-visual material.

ACCART's present membership consists of the Australian Veterinary Association, the Agricultural and Veterinary Chemicals Association, the Australian Pharmaceutical Manufacturers' Association, the Committee of Australian Biomedical Societies in Animal Experimentation, the Australian Academy of Science, the Australian Academy of Technological Sciences, the Australian Committee of Directors and Principals in Advanced Education, the NSW Department of Local Government, the Department of Primary Industry, the National Health and Medical Research Council, CSIRO and the Australian Vice-Chancellors' Committee.

The South Australian Department of Lands and the Australian Society for Laboratory Animal Science have been granted observer status and other applications for this type of membership are being considered. Consideration is also being given to the early appointment to ACCART of two laypeople to represent community interests.

RSPCA Australia Inc and the Australian and New Zealand Federation of Animal Societies have been invited to join ACCART. CSIRO's representative on ACCART is Dr Alan Donald, the Acting Director of the Institute of Animal and Food Sciences.

Melissa shows her pattern-drawing instrument to Dr Ron Stewart and her teacher, Ms Kathleen Dwyer.

Photo: John Masterson

CSIRO judges pupils

The Division of Radiophysics recently took part in the judging of Warrawee Primary School's annual science competition.

Pupils at the school in northern Sydney submitted more than 150 projects, which were judged by Dr Ron Stewart, Mr Geoff Crapps and Mr John Masterson, all of the Division.

Melissa Phegan, 11, won the prize, which is known as the Neil Briton Science Award in honour of the late Dr N. Briton, a former student at Warrawee who became the director of the Gatton Agricultural College.

Melissa designed and made an instrument for drawing patterns.

At last it is a scientific fact. The molecular basis of the 'vampire-repellant' action of garlic has been established, according to the Division of Chemical and Wood Technology's newsletter.

For further information see: Mahendra Kumar Jain and Rafael Apitz-Castro (1987) 'Garlic: molecular basis of the putative "vampire-repellant" action and other matters related to heart and blood', Trends in Biotechnology 12, 252–4.

The newsletter suggests this could be the start of a 'Division of Myths, Fables and Old Wives' Tales'.

New information service

A CSIRO Building Information Service designed to make scientific and technical information more available to industry and the public started in capital cities on 1 August.

The service will be run in collaboration with the Australian Home Owners Club Ltd, which is operated by SBIC Australia Pty Ltd, a Sydney-based company well-known for its building display, publishing and advisory services.

Announcing the service, CSIRO's Director of Information and Public Communication, Mr Peter Dunstan, said the Division of Building Research would work through the regional information managers to provide technical advice to the public, architects, builders, sub-contractors and other industry groups.

'The regional information managers have computer access to building information and registers of local experts', he said. 'They are aware of the services offered by the Australian Home Owners Club Ltd, which will be recommended where appropriate. More complex technical questions will be relayed to the Division of Building Research in Melbourne by electronic mail and dealt with by experts there.'

The service will be available to householders with queries on insulation, foundation movement, flood damage and a wide range of other building problems.

The Chief of the Division of Building Research, Dr Lex Blakey, said the Division had been answering these sorts of queries for many years but mainly in the Melbourne area.

Melbourne Show

cont. from P. 1

In 'Worlds of Science' visitors will be invited to walk through a series of environments in which audio-visuals will present perspectives on 'worlds' that few of us have seen.

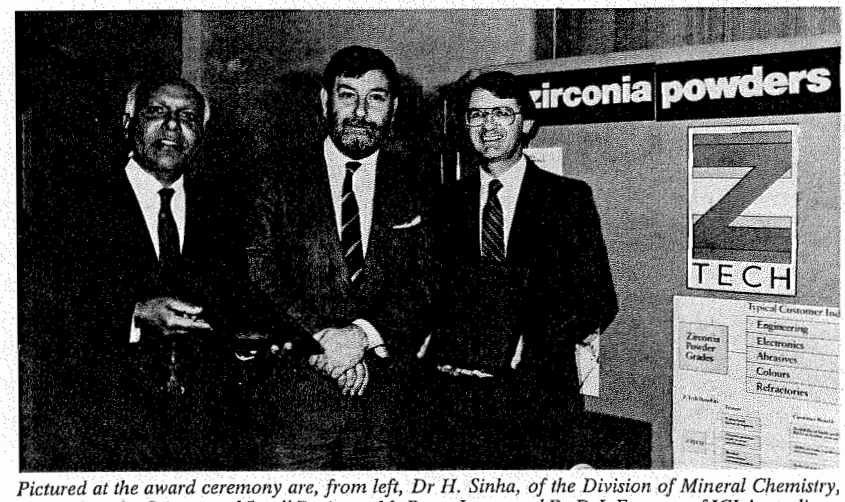
See the Earth from space as you would on board a satellite or take a look at outer space through an optical telescope. See the strange abstract images that CSIRO's radio astronomers will be creating when they start using their newest instrument, the Australia Telescope, next year.

Then zoom in on 'Inner Space' through a microscope and see the intricacies of the wing of a moth, the sting of an ant or the architecture of the living cell.

Whispering dishes, optical illusions, a mechanical device that magically sorts coloured balls, a demonstration of Pythagoras' theorem and an echo tube — in 'Fun with Science' visitors will be able to try, solve, understand or simply marvel at these and many more experiments.

Deane Hutton's shows will delight and dazzle even the most science-wise or cynical of visitors. Using simple everyday props such as mouse traps, ping pong balls and balloons, Deane's show will be a visual treat.

Between Deane's shows there will be continuous videos showing the importance and relevance of science and CSIRO's work to the community. CSIRO staff will be on hand at all exhibits and information booths to answer any queries about the organisation and its activities. CSIRO publications will also be for sale.



Pictured at the award ceremony are, from left, Dr H. Sinha, of the Division of Mineral Chemistry, the Minister for Science and Small Business, Mr Barry Jones, and Dr D.J. Fensom, of ICI Australia.

Award for research excellence

Research excellence in the development of high-purity zirconia ceramic powder has been recognised in an award to CSIRO's Division of Mineral Chemistry and ICI Australia.

The Federal Minister for Science and Small Business, Mr Barry Jones, presented the Australian Ceramics Society award on 19 August.

'This splendid research effort has not only resulted in novel, world-first technology, it has significantly contributed to Z-TECH, the marketer of the technology, being able to be strides ahead of international competition in this rapidly expanding engineering ceramics business,' Mr Jones said.

Less than four years ago ICI Australia and CSIRO agreed to work together to develop a novel production process for making zirconia.

Zirconia has a range of industrial uses but its most exciting application is in the manufacture of a new extremely strong ceramic, partially stabilised zirconia (PSZ), which is superior to steel for some industrial purposes.

The combined research team set out to develop a process where customers could specify their own zirconia requirements by nominating the purity, particle size, surface area characteristics and other important properties required to suit their own conditions.

The second key requirement was to offer customers pre-blended zirconia in a 'ready-to-press' convenience form which would eliminate powder-preparation effort.

Seven patents have been filed internationally covering the process and several more are in train.

The process was initially operated on a laboratory plant producing 100s of grams of zirconia. Now ICI is constructing a plant in Western Australia, which will be the largest high-purity zirconia plant in the world.

Zirconia from the plant will be marketed internationally by the ICI/CSIRO joint company, Z-TECH. Customers in Japan, the United States, the European Economic Community and Australia have now tested the zirconia and indicate that productivity and performance gains can be achieved.

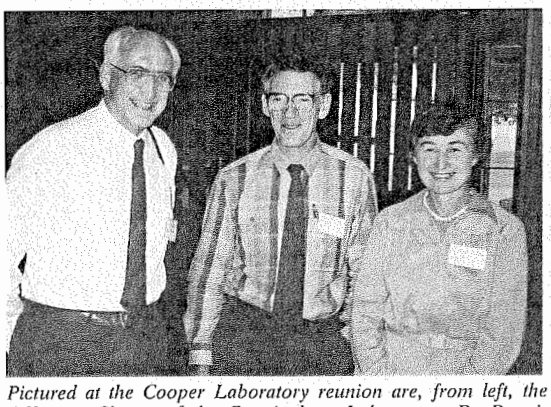
Mr Jones said Australia was now almost guaranteed a leading place in the industry thanks to this 'brilliant research'.

Cooper Laboratory reunion

More than 100 past and present employees of CSIRO and their families attended a reunion at the Cooper Laboratory in the grounds of the Queensland Agricultural College, Lawes, on 20 June.

CSIRO began experiments at Lawes in 1935 and five years later the Queensland Government built the Cooper Laboratory for use by the Organisation.

In 1950, 26 scientists and technical staff were based at the laboratory but today it is mainly used as a field centre for scientists with the Division of Tropical Crops and Pastures working at the Cunningham Laboratory.



Pictured at the Cooper Laboratory reunion are, from left, the Officer-in-Charge of the Cunningham Laboratory, Dr Dennis Minson, Mr Mike Russell, who worked at the Cooper Laboratory from 1963 to 1970, and Mrs Elizabeth Russell, who is also a former CSIRO employee.

CSIRO at Farmfest

The Division of Tropical Crops and Pastures took its expertise to Australia's second largest field days earlier this month.

The field days, known as Farmfest, are held at Kingsthorpe, near Toowoomba, Queensland, and attract some 40 000 visitors annually.

Visitors to CSIRO's stand were able to get the latest research results on grain legume crops and improved pasture plants. Scientists were available on the three days of Farmfest to discuss their research and answer queries.

Science, technology and the future

This is an edited version of the summary of a report to the Commission for the Future entitled *Australian Attitudes to Science and Technology and the Future*. Mr Richard Eckersley, CSIRO's senior media liaison officer currently on secondment to the commission, prepared the report which is based on more than 20 surveys carried out in Australia in recent years.

Australians applaud technological progress, and fear it. Information from recent surveys shows that we generally regard science and technology as good things, but feel threatened by their growing and seemingly uncontrolled power.

While aware that scientific and technological developments have improved our lives in many ways, we worry that they are also changing life in unintended and undesirable ways. Many of us appear to regard the future with a pessimism or unease nurtured by bleak visions of a world where machines have won, and people and nature have lost.

This anxiety may be heightened by the fact that few of us feel we are very well informed about science and technology. And most seem unaware or unwilling to accept how much technological change will affect us personally.

Generally speaking, support for science and technology in Australia is greater than most people think, with most Australians favouring a stronger effort in research and innovation.

More than half of us believe that technological developments have more benefits than disadvantages (55 per cent), that more emphasis on developing new technology would be a good thing (59 per cent), and that funding for scientific research and new technology should be increased (56 per cent). Less than one in ten believes that technological developments have more disadvantages than benefits (9 per cent), and that funding for science and technology should be cut (9 per cent).

Yet Australians' perception of the impact of technology appears to be strangely distorted. We rate new technology as one of the most important means of solving social questions, whereas history has shown that such technical fixes rarely, if ever, work. On the other hand, almost two-thirds of us (63 per cent) do not think technological changes will affect our own jobs or 'main activity', suggesting there is a long way to go before we accept that technology is making the notion of 'one job for life' a thing of the past, and that increasingly education and training will become a life-long process.

Overall, almost half of Australians admit to being poorly informed about the subjects, according to one survey. Of particular significance, given the importance of scientific and technological developments to our economic and social well-being, is the level of ignorance among our leaders.

Only one in ten leaders in business, government and trade unions considers himself or herself to be very informed about science. Four out of ten leaders say they are poorly informed about science, a far higher proportion than for the other issues included in the question, and the only subject about which leaders know as little as other Australians. Next comes computers and automation, about which a quarter of the leaders admit to being poorly informed.

This situation may now be improving, given the growing interest in science and technology in these circles. But the finding offers a simple explanation of why Australia's scientific and technological resources are under-utilised; why Australian industry's capability in this area is amongst the poorest in the industrial world; and why government has, until a few years ago, seen little need to do anything about the situation. And this, in turn, explains in part why we are now facing such serious economic problems.

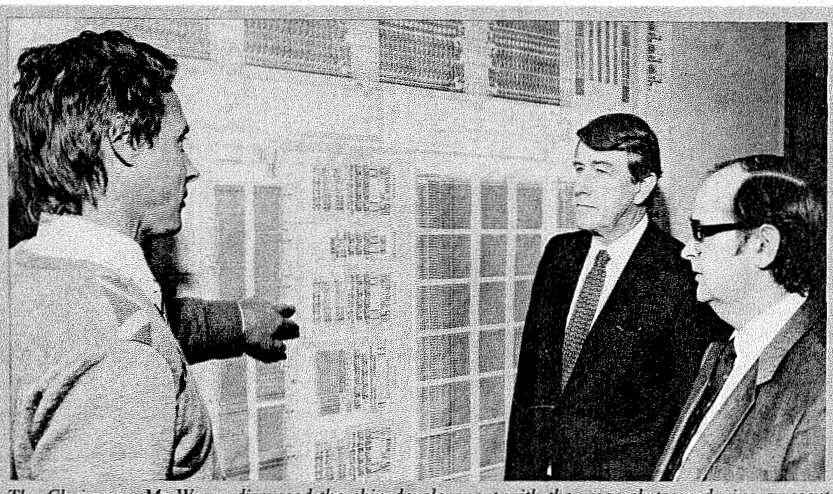
Nor, given this level of ignorance, is it surprising that, according to one study, many of us feel badly let down by our leaders over the lack of planning, management and education associated with technological change in this country.

But despite the ignorance, and for all their allure, Australians are aware that the fruits of scientific and technological progress have come at a price.

The worries about science and technology (with the exception of the nuclear threat) do not surface in surveys which ask people what their major concerns are, or to which issues governments should give priority; more immediate and more personal problems such as unemployment, tax, drugs, inflation, etc., tend to prevail. But these issues are symptoms — effects, not causes. Probing deeper, one concern about technology, at least, emerges.

cont. on P. 8

New FFT chip leads world



The Chairman, Mr Wran, discussed the chip development with the research team during a recent tour of the Division of Radiophysics. He is pictured with project leader, Dr John O'Sullivan, left, and the Chief of the Division, Dr Bob Frater.

The Division of Radiophysics, in conjunction with Austek Microsystems Pty Ltd, has adapted the Fast Fourier Transform (FFT) to VLSI chip technology in a development that is expected to have far-reaching effects in many areas of computing, particularly digital signal processing.

The Division's project leader, Dr John O'Sullivan, said the VLSI (Very Large Scale Integrated) chip was very much faster than single-chip alternatives and opened areas of operation that were previously impossible.

The chip's speed, plus its estimated low cost, is expected to impact in many areas of computing including satellite and telecommunications, voice and signal recognition, medical electronics, radar image enhancement, and studio-quality audio enhancement.

Dr O'Sullivan said the incorporation of FFT technology on a VLSI chip put the ability to process information at great speed into a much smaller package. In the past the commercial use of systems with FFT capabilities has been held back because they were too slow or too expensive.

The FFT itself is not new—it is a mathematical process that can convert data, signals or images into a form that may be interpreted more easily by the human mind. In other examples, the transformed information may be processed in a given manner and then re-transformed to produce a desired result.

The new, fast and comparatively inexpensive chip is believed to give Australian microelectronics at least a 12-month lead on the international market. Perhaps more significantly, its local availability will allow Australian equipment manufacturers to enjoy a similar advantage in developing novel applications of the chip.

The potential of the discovery has been recognised through a $1.6 million technology grant awarded by the Department of Industry, Technology and Commerce under the GIRD scheme. Austek has now produced the first versions of the chips from that program and is expecting to have products on the market within 12 months.

Further information, including that on an applications-oriented workshop to be held later this year may be obtained by contacting Dr Ian Albrey, Business Development Manager at Radiophysics, on (02) 868 0225.

Hobart education centre opens

The Tasmanian Premier, Mr Gray, left, with the teacher-in-charge of the centre, Mr Darrel Harington, and Double Helix Club member George Moshovakos.

The Tasmanian Premier, Mr Robin Gray, with a little 'high-tech' help from a robot, recently opened CSIRO's Science Education Centre in Hobart.

Mr Gray activated the robot which cut a ribbon and declared the centre open. After the ceremony, guests tried out a range of experiments hosted by members of the CSIRO Double Helix Science Club.

The centre, a joint venture between the Education Department of Tasmania and CSIRO, is the third science education centre in a nation-wide network. About 70 000 visitors have been to the centres in Melbourne and Adelaide, which were opened in 1982 and 1985 respectively.

A Sydney centre will open next year and centres for Darwin and Brisbane are planned.

The centres are designed to stimulate interest in science through 'hands-on' experiments. They demonstrate science at work, showing every day applications of science and technology.

The centres also act as the headquarters for the Double Helix Science Club.

Revolutionary plant testing kit

The Chairman, Mr Wran, unveiled last month a revolutionary plant test kit which should save farmers millions of dollars in yield losses caused by mineral nutrient deficiencies.

'The kit will place in the hands of farmers the means to carry out quick and simple checks for nutrient shortages, so they can be corrected before serious yield depressions have occurred,' Mr Wran said.

To be marketed as the Greenleaf Farm Lab, the kit does away with guesswork in deciding on nitrogenous and phosphate fertilizer levels, and eliminates the complications and delays associated with conventional laboratory testing.

Developed by the Division of Plant Industry in association with Australian Fertilizers Ltd. (AFL), the Farm Lab gives the farmer the ability to carry out accurate tests rather than having to send samples away for analysis.

'Instead of determining the nutrient status of the soil, the tests indicate the nitrogen and phosphorus contents of the crop and pasture plants themselves,' Mr Wran said.

'Not only can they tell the farmer whether fertilizer is needed, but also what response is likely.'

For the first time it is possible to constantly monitor what is happening in a number of paddocks simply by collecting small samples of plant tissue and taking them back to the farm office for analysis.

The results are available in under an hour, so the farmer may be able to remedy deficiencies immediately, forestalling yield losses. Alternatively, fertilizer can be applied to ensure the subsequent crop is adequately supplied.

The new tests, using young plant tissue, avoid the difficulties associated with soil tests, which do not necessarily reflect the phosphorus or nitrogen status of the growing plant.

Australian soils are generally deficient in both phosphate and nitrogen. With the squeeze on farm incomes and increasing fertilizer prices, it is important that optimum levels of both nutrients be applied to avoid costly production losses through deficiency, or waste through oversupply.

CSIRO's experiments have sought to define the critical levels of these nutrients needed for optimum crop or pasture growth. Below these levels, fertilizer would need to be added.

Each nutrient requires a separate test, and the procedures have been made as simple and reliable as possible.

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There is no division feature in this issue of *CoResearch*. A feature on the Division of Wildlife and Rangelands Research will appear in the October issue.

Poultry project

The Division of Animal Health is making an important contribution to the future of China's poultry industry.

The Division is managing a five-year Australian Development Assistance Bureau project to assist the Chinese to establish a Poultry Diseases Diagnostic and Training Centre and to develop a National Nucleus Specific Pathogen-Free (SPF) Poultry Facility.

The project's director, Dr Trevor Bagust, the acting Chief of the Division, said the total budget was $11.3 million, of which the Australian contribution would be $4.2 million.

The ADAB project was generated following Chinese requests to Australia for assistance.

Dr Bagust said China had identified the further development of the intensive poultry industry as a national goal but as production intensified so disease problems became more severe.

The diagnostic and training centre at Tianjin, some 150 kilometres from Beijing, was currently being constructed within the precincts of the Tianjin Municipal Bureau of Animal Husbandry.

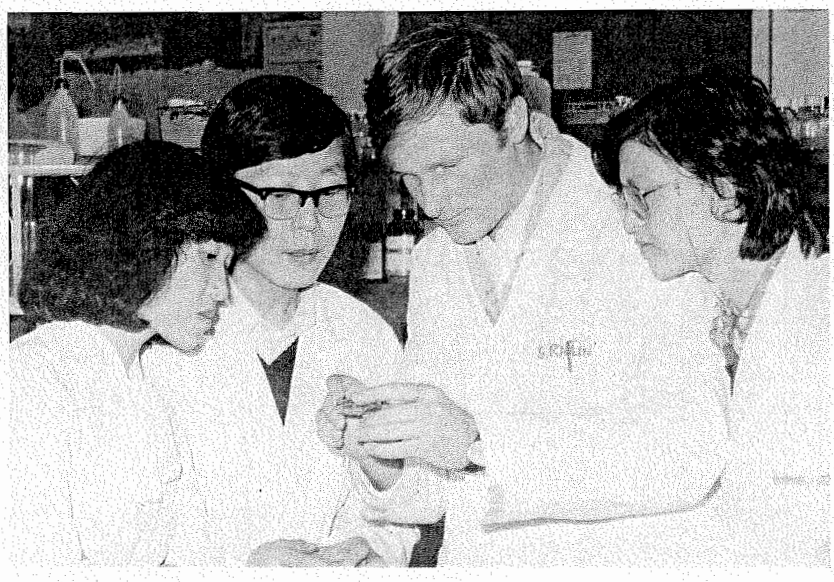


Photo: Bob Campbell

Three of the Chinese trainees with the Division, from left, Mrs Li Fugui, Mr Zhang Wensheng, and Mrs Guo LiLi with the project's training and scientific liaison officer, Mr Grant Rawlin

Dr Bagust said the laboratory was expected to be officially commissioned in May next year. It would then undertake training of poultry-disease diagnostic specialists for all of China's 30 provinces.

The National Nucleus SPF Poultry Facility would eventually underpin all of China's poultry vaccine production and avian-disease diagnosis and research.

This facility would be established in a special building to be constructed at the Harbin Veterinary Research Institute in north-east China, he said.

Its design and operation would be based on the building and isolator systems of the Division's National SPF Poultry Unit at Maribyrnong, Victoria.

Dr Bagust said four Chinese scientists were already working with divisional staff in order to develop the skills needed to manage the new units.

Three of these scientists are based at the Veterinary Research Institute of the Victorian Department of Agriculture and Rural Affairs and the Division's Parkville Laboratory where they are undertaking additional training in the virology, pathology and bacteriology of poultry.

Mr Zhang Wensheng, Mrs Li Fugui and Mrs Guo LiLi are from the Tianjin Municipal Bureau of Animal Husbandry and will spend nine months in Australia.

Another scientist, Mr Nan Xi, is spending nine months at the Maribyrnong Experiment Station developing the skills he will need to head China's SPF poultry facility.

Dr Bagust said a further four scientists would receive advanced training in Australia over the next three years.

Big step in gene synthesis

Heralding a new era in crop disease control, CSIRO researchers have synthesised a gene which gives tobacco plants resistance to a viral pathogen.

The research is described in the current issue of the international scientific journal *Nature*.

According to Dr Wayne Gerlach, of the Division of Plant Industry, the successful project is a major step forward in extending a novel form of disease resistance to important food crops.

'Tobacco is used around the world as a standard test plant for genetic engineering because it is relatively easy to work with,' he said.

'We now want to build resistance genes for barley yellow dwarf virus disease in cereals. This is the most destructive virus disease affecting grain crops — estimated to cost $40 million a year on average in the Australian wheat crop alone.'

The artificial resistance gene is derived from a molecule discovered in United States glasshouses. It is passed from one generation of genetically engineered tobacco plants to the next, giving them a large degree of resistance to the virulent ringspot virus.

The molecule on which the gene is based was first cloned in the US before being brought to the Division's Canberra laboratories. There Dr Gerlach, along with colleagues Drs Danny Llewellyn and Jim Haseloff, constructed an artificial gene from the molecule and inserted it into tobacco.

'The synthetic gene exists in the tobacco plants without harming them,' Dr Gerlach said. 'The genetically engineered plants grow normally when there is no virus infection, but they are much better than ordinary plants when infected.'

'When the ringspot virus enters the plant, it meets molecules produced by the gene and multiplies them up instead of itself.

'The molecules thus act as decoys. They slow the rate at which the virus takes over the plant cells, or even stop it altogether.'

First OIC of National Standards Lab dies

Dr George Briggs, who died on 24 July at the age of 94, was the first Officer in Charge of the Physics Section of the National Standards Laboratory.

Dr Briggs, Mr N.A. Esserman and Dr D.M. Myers were the first members of the staff of the laboratory, being appointed late in 1938.

At the time of his appointment, Dr Briggs was Assistant Professor of Physics at the University of Sydney. He graduated from the university in 1916 with honours in physics and mathematics and was appointed Lecturer in Physics in 1918 and Assistant Professor in 1928.

In 1925 and 1926 he worked at the Cavendish Laboratory, Cambridge, with Sir Ernest Rutherford and was awarded the degree of Doctor of Philosophy on the basis of this work.

He again worked in the Cavendish Laboratory in 1936 and 1937, and at that time also visited research institutions in the United Kingdom, Europe and the United States. In 1937, he was awarded the degree of Doctor of Science by the University of Sydney.

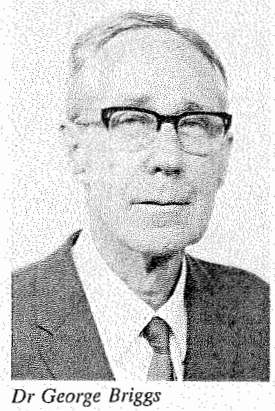
Much of Dr Briggs' earlier work was in the field of radioactivity, but it involved the making of very precise measurements of electrical quantities.

This experience was immediately valuable in the establishment of standards and measurement techniques when he was appointed to the National Standards Laboratory.

He built up a strong team of scientists and in 1945 the section was given the status of a Division of CSIR.

Dr Briggs believed that it was essential that the basic standards work of the laboratory should be accompanied by research in related fields and encouraged young scientists to initiate appropriate work.

By the time of his retirement in 1958, the Division of Physics had developed an international reputation in its fields of specialisation, including the physics of temperature and humidity measurement, photometry, optics, the properties of fluids and solids, and solar physics.



Dr George Briggs

Dr Briggs was scientific adviser to the Australian delegation to the United Nations Atomic Energy Commission during 1946 and 1947. He was active in the Australian Branch of the Institute of Physics, becoming President of the Branch in 1950, and later took part in the formation of the Australian Institute of Physics. He was a keen conservationist and was Chairman of the UNESCO Australian Committee for Natural Science from 1953 to 1955.

After his formal retirement, Dr Briggs worked in the laboratory for several years as a Senior Research Fellow. Even after this arrangement was terminated at his own request, he continued to work on projects of special interest to him, especially in the production of very stable standards of resistance.

In the period of over 40 years in which he was associated with the laboratory, George Briggs undoubtedly made a significant contribution to its development as one of the world's major standards and applied physics laboratories, both through his personal research and through his leadership.

J.F.H. Wright

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39 years with CSIRO

Mr Owen Filsell, a senior experimental scientist with the Division of Human Nutrition, retired recently after 39 years with CSIRO.

Mr Filsell served in three Divisions and under four Chiefs, but all at the same site at Kintore Avenue, Adelaide.

At his retirement lunch colleagues paid tribute to Mr Filsell's skills in animal surgery through which he made an invaluable contribution to CSIRO's research.

Gozho pump installed but appeal goes on

Many readers may have been wondering what happened to the Gozho pump appeal. Most will remember the fund, which was set up through an article in *CoResearch* in August last year following a visit to Zimbabwe by a crew from the Film and Video Centre.

The appeal, to help buy a pump for the school in the remote community of Gozho, met with a very generous response from CSIRO staff throughout the Organisation. A total of $2651.43 was raised and sent to David Gwaze at the Forest Research Centre in Harare in March.

At the going exchange rates, plus a little interest, the total came to just over 3009 Zimbabwean dollars. David Gwaze has gone to Oxford for a short post-graduate course and in his absence the fund was administered by Hugh Stewart, an Australian forester working in Harare.

Russell Porter, who co-ordinated the appeal at this end, has received the following letter from Hugh:

'Dear Russell,
Good news at last. The pump has been purchased and installed, and is now delivering water to the school's vegetable garden. It would have been nice if you and your colleagues had been here last week to witness the first gush of water, and the ensuing excitement of the grateful recipients.

'David and I went to Masvingo on 25 June and ordered the pump and fittings from a local irrigation supplier. After a three-month wait they had finally obtained some 50mm black polythene pipe, which we were lucky enough to snap up. We then visited Gozho, rechecked our measurements, and promised delivery to Mr Chatikobo within a fortnight.

'I delivered the pump, fittings and 80 metres of pipe on 1 July (the day that David departed for Oxford). Upon arrival, the whole school gathered around the vehicle and burst into song as a gesture of welcome and thank you. With the enthusiastic assistance of several hundred children, Mr Chatikobo' and I installed the system, and much to everyone's delight, it worked perfectly first time.

'The system is easy to operate, and for the time being, the pump and suction line will be disconnected after each use and stored as a security precaution.

'The whole operation of carrying the pump to the dam, connecting it, keeping the suction line free of mud, and operating the two hoses in the garden, will probably only require six students for two hours each day, as opposed to 400 to 500 children each doing 10 trips to the garden with water containers. What a difference!

'Our preference would have been to purchase a long-lasting diesel motor for the pump but the price of diesel was five times that of petrol, and only a reconditioned diesel engine at that. We can expect a service life of four to five years for the unit we bought, and during that period, can get any maintenance done at Stewart & Lloyds in Masvingo.

'We have to accept the fact that the motor has a limited life-span, because it cannot be reconditioned if the current spare parts situation continues.

'A statement of accounts is enclosed. As it turned out, the School Council contributed $100 to purchase 55 metres of hose to attach to the two taps in the garden. Such is the price of manufactured goods, which means, unfortunately, that there are no funds remaining to purchase some books.

'There were logistical difficulties in organising a ceremony on the day of delivery, not the least being dragging David off the aeroplane! So Mr Chatikobo is planning a celebration for the pump in October, with invitations to parents, local dignitaries and the press. It should be quite a day, and we will send photos and a report of the event after we have recovered.

'I have asked Mr Chatikobo to write to you directly with a personal report of progress once the routine of operating the system has been established, as I'm sure that you would appreciate a first-hand account of what is happening.

'With very best wishes from both David and myself.

Hugh Stewart'.

Hugh has sent copies of receipts and bank accounts, and it's refreshing to note that every cent of the fund (with the exception of Z$ 2.22 postage!) went on the pump, pipe and essential maintenance tools.

Unfortunately the current situation in southern Africa means that manufactured goods are extraordinarily expensive, so there was no money left to help replenish the school library (destroyed during the war in 1981) as originally hoped.

However, the fund is still open! The current balance is $A87 (interest paid after the appeal money was transferred). If anyone is interested in topping it up, they can send direct to Sirocredit, 2nd floor, 9 Queens Road Melbourne 3004. Account No. 4898, S1.1 Gozho Pump Fund. A few hundred dollars would buy a lot of useful school books.

If anyone cares to see the school, the children and the situation before the pump was installed, they can readily borrow a cassette of the film *Green Envoys* from the Film Librarian, CSIRO Film and Video Centre, 314 Albert Street, East Melbourne, 3002, or phone (03) 418-7376

Footnote: Russell Porter has resigned from the film unit to join the Documentary Division of Film Victoria. Robert Kerton (who was Sound Recordist on *Green Envoys*) has agreed to take over any formal administration of the Fund.

Russell Porter

First citrus breeding workshop

Overseas visitors to the workshop, Dr Paul Glucina, from New Zealand, Dr Aliza Vardi, from Israel, and Dr Jude Grosser, from the United States, inspect an Australian native citrus plant, Eremocitrus.

Leading horticultural researchers from Israel, the United States and New Zealand were among those who attended a workshop on citrus breeding held recently at the Division of Horticultural Research, Merbein.

The workshop was the first of its kind in Australia to focus specifically on genetic improvement in citrus.

It brought together representatives of the Australian citrus industry, research scientists from CSIRO and several Australian universities, and delegates from Departments of Agriculture throughout Australia.

The workshop aimed to define objectives for citrus cultivar improvement and assess the need for future breeding, as well as enabling the interchange of ideas on new genetic improvement methodologies.

It also provided an ideal opportunity for discussions on future collaboration and co-ordination of citrus research.

New adhesive set to lift restrictions on plywood industry

Scientists at the Division of Building Research, in collaboration with Monsanto Australia Limited, are developing a newly discovered phenolic adhesive, which promises to breathe new life into Australia's plywood industry.

Restrictions on the use of rainforest species for plywood production has forced the industry to use dense eucalypts, such as Blackbutt and Flooded Gum. Existing adhesives soak into these woods, resulting in poor bonds and plywood products with limited applications in outdoor environments.

Mr Peter Collins, an adhesives expert at the Division, has discovered a revolutionary adhesive binder that will allow these readily available eucalypts to be used for the production of superior-quality plywoods.

'This work will not only have solved a major raw materials problem for the industry, but will also lead to a new generation of Australian plywood products which will be waterproof and extremely strong and durable,' the program leader, Mr Keith Martin, said.

'New uses for these unique Australian plywood products will range from the better bracing of timber building frames to the potential replacement of heavy steel in freight containers and other high-strength applications,' he said.

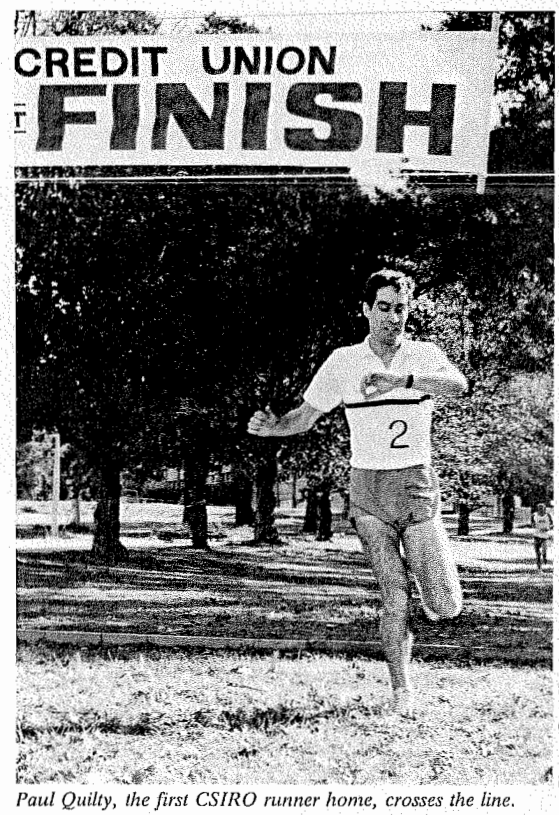
The new CSIRO adhesive will be further developed, commercialised, and marketed through an agreement with Monsanto Australia Limited, a company with over 30 years experience in developing and supplying adhesives to the plywood industry.

This agreement will provide much-needed funds for research collaboration and pilot-plant production, leading to licensing and royalty payments for further research.

'As well as benefiting Australia's plywood industry, the result of this research and commercialisation is expected to be a high quality export market for Australia,' Mr Hugh Forest, market manager (resins) for Monsanto, said.

Forest Research wins cup

The winners of the Black Mountain Cup. From left, Jamie Hoare, Mike Sutton, John Raison and Mick Crow.



Photos: Greg Heath

Paul Quilty, the first CSIRO runner home, crosses the line.

A team from the Division of Forest Research won for the first time, the 11th Black Mountain Cup which was run in July.

The Forest Research team — Jamie Hoare, Mike Sutton, John Raison and Mick Crow — won in an aggregate time for the four runners of 1hr 33 min 13 sec. The Division of Plant Industry came second, CSIRONET third and Entomology fourth.

The individual winner was the Australian orienteering champion, Maurice Ongannia, who does not work for CSIRO. Outright CSIRO winner was Paul Quilty, of the Black Mountain Library, in a time of 21 min 6.8 sec for the 5.6-kilometre course.

Jenny Bourne, of the Division of Entomology, was the first woman home in 22 min 48.8 sec.

Sirocredit sponsored the fun run and many prizes were awarded.

Scientist visits China

A senior scientist from the Division of Mineral Physics and Mineralogy at North Ryde spent two weeks in Guilin recently selling his exploration technique to the Chinese.

Dr Brian Gulson was a guest of the Research Institute of Geology for Mineral Resources, China National Nonferrous Metals Industry Corporation (CNNC), where he gave a short course on the use of lead isotopes in mineral exploration.

The technique, known as SIROTOPE, has been successfully applied both in Australia and overseas. It is totally funded by exploration companies who avail themselves of the expertise of Dr Gulson and his team and of the Division's facilities.

CNNC is a major nonferrous metals research, exploration, mining and export/import corporation employing more than 1.2 million people.

Among the participants at Dr Gulson's course were members of CNNC's geological exploration teams from all over China, staff of the Research Institute, the Ministry of Geology and Academia Sinica.

Following the success of the lead isotope method in Australia, CNNC has embarked on a major exploration program for lead, zinc and copper in Xinjiang Province in the north-west and for copper and gold in eastern China.

Australian attitudes to science and technology **cont. from P. 4**

Unemployment often tops the list of Australians' concerns, and we regard technological change as among the main causes of it. (We do not, however, see slowing the introduction of new technologies as a useful means of combating unemployment. It seems we feel technological change is inevitable, unstoppable; we might also recognise that the cure would be worse than the disease.)

Generally speaking, however, the concerns about science and technology are too fundamental to our technological society, and often too vague to show up in questions about what worries people most. But they are expressed, implicitly or explicitly, in answers to other questions.

About the same proportion (roughly 60 per cent) that support a greater emphasis on developing new technology also agree that through science and technology we have unleashed powers beyond our control; that we are gradually being taken over by machines; and that these days everything is changing too fast. Even more (77 per cent) say a simple, more natural lifestyle would be a good thing.

One study, based on group discussions rather than a statistical survey of a large number of people, concluded that Australians accept the growing use and sophistication of technology at a 'rational' level, but at an 'emotional' level feel threatened and worried by it.

But this ambivalence towards science and technology, which has also been found in overseas studies, also reflects their dual nature — that is, their capacity to do, or be used for, both good and ill— and a very real problem in controlling technological change: the benefits of introducing a particular technology are specific, obvious and easy to measure; the costs are often diffuse, hard to measure, and often only become apparent long after the technology's introduction.

Science and technology, especially in the guise of nuclear weapons, pollution and computers, but also because of the uncertainties created by the accelerating rate of change for which they are responsible, appear to be a major source of the pessimism many Australians feel about the future.

Survey findings indicate that we are overwhelmingly optimistic about our own personal future: 'she'll be right' remains the byword for about 90 per cent of us. But at a broader level many are uneasy about where society is going, and the pace at which it is heading there. At this level, according to one study, we are more inclined to believe, 'she's out of control, so why worry?'.

One survey suggests only a tenth of people between 18 and 24, and a quarter of those between 25 and 34, believe that 'things will continue to get better' in the future. About six out of ten agree that our children will have a more difficult life than we have today, and that the future is so uncertain that it is better to live from day to day.

In fact, many of us prefer not to think about the future, feeling that coping with the present is taxing enough. Others say the changes we are experiencing are no more dramatic than those of the past, and that whatever adults may feel, children will always cope with their environment, whatever the changes.

Yet the growing domination of science and technology over our lives, and the pessimism it provokes, is nowhere revealed more graphically than in two surveys in which primary and secondary school students were asked to describe the future. Some, usually the younger ones, see an exciting world of space travel and beaut new gadgets, a place where people have it easy while machines do all the work.

But for many the prospects are very different. The world of the future, of their adulthood, is one devastated by nuclear war, a world in which nature has been plundered and destroyed, and in which computers and robots have consigned many people to the scrapheap. (To these horrors we could doubtless now add AIDS.)

Many are visions of hopelessness and despair. Many of the teenagers in one study could not imagine, even when asked, a peaceful and desirable future. According to the authors of the studies, the visions are not mere science-fiction fantasies, but reveal real fears that may be profoundly affecting the students' attitudes and development.

If this is the case, the desolate images of the young also reveal something else: if we want to create a better future for Australia, a future our children will look forward to, we will have to pay much more attention to science and technology.

The task we face poses a major challenge to our leaders, one which they have only just begun to address in recent years.

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***CoResearch* is produced by the Public Communication Unit for CSIRO staff. Readers are invited to contribute or offer suggestions for articles. The deadline is the last Monday before the issue month. Editor: Liz Tynan, PO Box 225 Dickson ACT 2602. Ph: 48 4479.**

CoResearch

CSIRO's staff newspaper

No. 306 October '87

The Budget

Facts, figures and some (concerned) comment

CSIRO's 1987/88 appropriation is 1.2 per cent less in dollar terms than expenditure last year. This is mainly because less funds are needed for CSIRO's works and building program, and because CSIRO will have access to revenue from the sale of surplus land and buildings, as well as other receipts and increased external funding.

A reduction of $3.7 million has been applied to CSIRO for the Government's 'efficiency dividend' policy.

CSIRO has appropriated $325.1 million for on-going operations during 1987/88, compared with expenditure of $326.1 million (including the $5 million special ESIS appropriation) in 1986/87.

For capital works, the appropriation is $29.6 million compared with $32.9 million expenditure last year. This year $40.8 million is expected to be available from general revenue, property sales and other receipts; in 1986/87 expenditure from this revenue was $32.9 million.

Funds from industry, granting bodies and public sector agencies for specific research projects are expected to rise by 20 per cent to $65 million.

Of the reduction applied to CSIRO's appropriation this year, $5 million was because the Government decided (as announced in the May mini-budget) that these funds could be replaced by CSIRO earning additional research contract funding. Increases in contract funding flow directly to those divisions earning them.

Reductions to CSIRO's appropriation, together with continued expansion of work in targeted high priority areas (particularly information technology and manufacturing technologies), means that, as expected, divisions will receive an average five per cent less basic appropriation funding this year. Central service areas will receive 5.75 per cent less.

The reduction in real terms over the past few years of appropriation funds, together with redeployment of research effort and the increased emphasis on research which receives direct support from industry, is changing the face of CSIRO. This change is the subject of disquiet among divisions. This year, *CoResearch* contacted a sample of division chiefs for their views:

Dr Warren Hewertson, chairman of the Chiefs' Committee and Chief of the Division of Chemical and Wood Technology, said mechanisms for coping with a substantial decrease in appropriation funds were not sufficiently flexible to allow rapid response. 'So much of divisions' expenditure is impossible to reduce quickly, being in the form of salary and fixed operating costs. Thus the major burden of reduced funds is falling on research operating costs and equipment purchases. All divisions are having to make drastic sacrifices in these areas. While the Early Separation Retirement Scheme (ESIS) has given some scope, once the division's contributions have been honoured further salary savings can only be achieved by not renewing term appointments, holding positions vacant and shedding staff through redundancy procedures. While many divisions have been able to increase their external funding over the years, in future such funds will be required to support indefinite appointees. This approach will require the cessation, or putting in abeyance, of work of either low priority or of a long term nature. The management of this approach will require great attention in overcoming the obvious pitfalls. Chiefs welcome the respite announced by the Board at the Perth meeting which will result in $2 million of funds to be redirected to Institutes,' said Dr Hewertson.

Dr Bob Brown, Chief of the Division of Manufacturing Technology, said while his Division was more fortunate than some, the cuts still hurt. Probably about five per cent will be lopped from his appropriation. He has had to freeze some positions, and this had made it difficult to effectively carry out work such as the vital CAD/CAM research. Outside funding for the Division is substantial, and where possible Dr Brown tries to get people as well as cash. This has several advantages, in terms of salaries and also in disseminating high level knowledge once the person returns to his/her company. The Division is now getting the benefit of earnings from the Synchro-Pulse welder and the Metlflow software, and this had eased budgets cutbacks somewhat.

Dr Dave Mahoney, Chief of the Division of Tropical Animal Science, said the latest

Cont. on p.7

Institute shakeup to take effect from 31 December

About 35 staff based at headquarters will be directly affected by new Institute arrangements resulting from the reorganisation.

It has been decided that four of the six proposed new Institutes will be based in either Sydney or Melbourne. The other two will be situated in Canberra.

At the meeting it was decided that 'timely, adequate and appropriate personnel and financial counselling services' would be provided to Institute staff required to relocate but who were unwilling or unable to do so.

Affected staff will be temporarily 'attached' in Canberra for three months to positions in the new Institutes from 1 January 1988, although this may be extended in individual cases if warranted by circumstances.

Dr Michael Pitman is liaising with all current Directors to finalise placements for staff and by the time this issue comes out staff should know what they will be doing during the three month interim period. Talks are also underway with the relevant unions.

Directors and acting Directors of the new Institutes will call for expressions of interest for positions as soon as possible after 1 January, from staff in CSIRO only.

Advertisements will only be placed externally when it is not possible to fill an Institute position internally.

From 31 March the new Institute headquarters will be:

*Energy, Minerals & Construction (IMEC) — **Sydney**
*Information & Communication Technologies (IITC) — **Sydney**
*Animal Production & Processing (IAPP) — **Sydney**
*Industrial Technologies (IIT) — **Melbourne**
*Plant Production & Processing (IPPP) — **Canberra**
*Natural Resources & Environment (INRE) — **Canberra**

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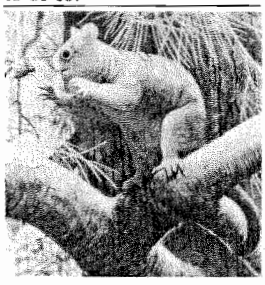


Just a small taste of the fabulous work of Frank Knight from the Division of Wildlife and Rangelands Research. The Division is featured this month.

Hawke praises CSIRO effort at Royal Melbourne Show

More than 780 000 people visited this year's Royal Melbourne Show, where CSIRO was the featured exhibitor.

The CSIRO exhibition — Adventures with Science — was officially opened by the Prime Minister, Mr Hawke, on Sunday 20 September.

Mr Hawke said Australia would not be as economically well placed as it was today if it had not been for the commitment and dedication of those working for the Organisation.

He congratulated CSIRO for reaching out to the people and described the exhibition as a way in which people without highly developed scientific understanding could learn what 'this great institution is doing'.

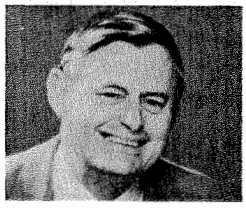
Sales of CSIRO publications at the show exceeded $12 000 and organisers reported good feedback from the public.

In the words of one organiser: 'We set out to show that science could be fun and we achieved that'.

More photos from the show will appear in the next issue of *CoResearch*.

Science educator and media personality, Deane Hutton, right, shows the Prime Minister one of the experiments demonstrated at the show. Photo: Dennis Wisken, Channel 10

From the Chief Executive



A column by Dr Keith Boardman

The Chiefs and Staff Associations have expressed their concern that McKinsey & Co may not be used for the review of the CSIRO corporate services to cover Headquarters, regional administrative offices, the Bureau of Information and Public Communication and the Centre for International Research Cooperation.

The staff of McKinsey have gained a considerable understanding of the Organisation and I agree that it would be logical to use the same team for the review of corporate services. McKinsey proposed a costly study of 3–4 months, which the Board considered unsatisfactory in view of the need to have the new structures operating soon after the appointment of the Institute Directors and the senior line managers in the corporate centre.

The Board agreed that I seek a proposal from the firm of Pappas, Carter, Evans and Koop, who have established an excellent reputation with the business community, although they are not as well-known as McKinsey & Co. Pappas, Carter, Evans and Koop submitted a proposal which was seen by the Board at its meeting in September and I was requested to negotiate further with the firm.

The first part of the study would define the essential activities which need to be carried out by the corporate staff for the effective and efficient operation of CSIRO, taking account of the decisions from the McKinsey studies and the agreed devolution of activities to Institutes and Divisions.

Having defined the essential activities for the corporate staff, a detailed analysis would be conducted of the relevant existing activities in order to determine the essential resources needed for the corporate services and support for the Chief Executive.

A project team would be formed with members from Pappas, Carter, Evans and Koop and CSIRO, and with Mr Bernie Mithen as project leader. The project team would report to a review group, chaired by myself with Drs Pitman, Reid, Hewertson and Foley as members. Its task would be to make firm decisions on the propositions from the project team.

I wish to assure all staff that the Board and top management are fully committed to a thorough and independent review of the corporate centre and I will ensure that decisions from the review will be fully implemented.

Keith Boardman

NOTE: following is the text of Dr Boardman's message to staff on recent press reports:

I wish to make some points clear following newspaper reports to the effect that the CSIRO Chairman, Mr Wran, has been accused of applying a gag to CSIRO.

The reports referred to a question in the Senate on 18 September. Senator Richardson was asked whether the Chairman had instructed CSIRO officers 'not to make any public statements or release any scientific information' that supports logging of North Queensland rainforests.

The points I wish to clarify are these:

1. The matter was somewhat more complex than most press reports indicated. It involved a CSIRO officer agreeing to address a public meeting later described in the local media as 'a rally to protest the proposed World Heritage Listing'.
2. Whatever the circumstances of this matter, and while staff must always be wary of being used or manipulated in debates on politically sensitive issues, CSIRO guidelines on public comment are clear.
3. The guidelines were endorsed by the CSIRO Executive in 1985 and still apply. They encourage you to communicate with the public about your work and to contribute to public debate on issues within your expertise. The qualifications are that you should:
   - *make it clear when expressing a personal opinion (as opposed to a CSIRO position) although staff may still identify themselves with CSIRO;
   - *observe confidentiality where necessary — for example in some commercial areas;
   - *take into consideration any effects statements might have on the Organisation's standing in the community.

On this last point it is advisable to consult your OIC or Chief when making comments on controversial or sensitive issues.

CSIRO has a high reputation in the community as an authoritative and independent source of information and advice on many issues of public concern. It is a reputation all staff should cherish, and which the public comment guidelines are intended to enhance.

Health Matters

Proposed reforms to Commonwealth employees' compensation arrangements

It is likely that new arrangements for Commonwealth employees' compensation will be in place by 1 April 1988.

The new scheme will be administered by a commission (to be known as Comcare) which will cover both compensation and occupational health for the Commonwealth workforce.

Coverage is likely to be implemented in stages with all new injury/disease cases being covered from 1 April, existing cases of current employees from 1 October, and existing cases of ex-employees from 1 April 1989.

Key provisions of the new scheme are expected to include maintenance of full salary for 39 weeks; a maximum total benefit of 90 per cent and minimum of 75 per cent of pre-injury salary thereafter; and cessation of all benefits at age 65. A maximum lump sum of $75 000 will be payable for permanent impairment. Common law rights for employees to sue the Commonwealth for personal injury will be abolished, however damages for pain and suffering are likely to be retained.

Retirees receiving in excess of their pre-retirement salary will have their total benefits reduced to pre-retirement salary level from 1 April 1988 after which the benefit level will be frozen until it falls to 90 per cent of pre-retirement level. Compensatees over the age of 65 will begin to lose their compensation entitlement on 1 April 1989.

Hand/Arm Injury

There has been a sharp jump in the number of accidents within CSIRO involving injury to hands or fingers through the use of tools such as saws, guillotines, machining devices.

In several instances the tools had been fitted with guards, but these had been either removed or by-passed.

Staff should ensure that common sense precautions aimed at preventing serious injury are observed when using such tools.

They should ensure that:

*where appropriate, guards are fitted

*when guards are fitted they are not by-passed

*any adjustments or modifications are not made while the machinery is operating and unguarded.

National OH&S Survey

A national survey of organisations in both the public and private sector has recently been completed by the National Heart Foundation.

The survey attempted to gain objective data on the effectiveness of programs in terms of health gains, absenteeism, staff turnover and accidents and determined that there is great variation in the type and quality of resources available.

While a full analysis of survey data is yet to be released, it is apparent that the major problem lies in ensuring effective and reasonably priced resources and programs.

Cont. on p.8

Letters to the Editor

Dear Editor,

I have strong suspicions that reasons for the suggestion of a total smoking ban on all indoor areas under the control of CSIRO are based on an anti-smoking obsession (or because of intolerance) rather than for valid health reasons.

I do not see how allowing smokers their own well ventilated area to smoke in, (or to smoke in their own room), can possibly involve a risk to others.

Passive smoking may or may not be a significant health hazard, positive results are often based (biased) on flimsy evidence and spurious relationships. Experimental data to prove toxicity are usually obtained by subjecting small animals to unrealistically massive doses of suspect material. Just about everything is unhealthy if taken in large enough doses.

Traces of possible carcinogenic substances have been identified in cigarette smoke, however, there is nothing magic about the tobacco leaf. We are in regular contact with potential carcinogens which can be formed when burning many organic substance — other plant materials, meat, oil, coals, food additives etc. etc. etc.. People searching for a no risk environment will only find it in paradise.

Personally, I'll consider myself fortunate if I am one of the approximately 40 in 100 000 population who die from lung cancer, (not all of these deaths are cigarette smoke associated), as this disease usually occurs at an old age, and I will have avoided the diseases and hazards which tend to take lives at a much earlier age.

Thanks for the offer of counselling, however I shall continue to partake (in moderation) of cigarettes, so-called unhealthy foods and alcoholic drinks that I enjoy. At least I won't come down with the illnesses that arise from the fear of being ill.

John P Yuritta
Division of Chemical and Wood Technology

Dear Editor,

In *CoResearch* No. 302, your headline reads 'Total ban on smoking', whereas the CSIRO policy circular (No. 87/18) is titled 'Smoking in the Workplace'. Many thanks for the interpretation.

Since you have been so kind, would you, please, assay a reconciliation of the phrase in paragraph 5 of the circular, 'opportunity to adjust' with the phrase in paragraph 6, 'smoking is an addiction'?

I think the authors of the circular got the last remark right. Studies of recidivism among drug addicts — all types from aspirin through heroin to zedoary — indicate that relapse is by far the greatest in tobacco smokers.

I think your cartoonist knows more than the person in the Public Service Board who initiated this costly and absurdly uninformed pogrom which, to my great surprise, an erstwhile scientific organisation has unthinkingly adopted — or has it? Will McKinsey's ride rescue sanity; or has he arrived too late?

Perhaps it's time to get back to Jew-baiting, union bashing, etc! At least such groups know how to cope.

J J Lenaghan
Editorial and Publishing Unit

Dear Editor,

May I use your columns to express my appreciation to the hundreds of CSIRO scientists, technical and administrative staff who assisted me during my period as Shadow Minister for Science from October 1985 to August 1987.

During that time I visited more than 70 CSIRO establishments in most states of Australia, and was impressed by the welcome extended to me, the enthusiasm and dedication of the members and the excellent quality of work being conducted.

Please be assured that I will be maintaining a close interest in the CSIRO and the immense

Cont. on p.8

Division Feature *Wildlife & Rangelands Research*

No 'gizmos' for applied Division

The Division of Wildlife and Rangelands Research may not produce 'gizmos' for export but much of its work is still very applied, according to the Chief, Dr Brian Walker.

Dr Walker said although much of the Division's work could be seen as 'more basic' than that of other divisions, it was aimed at real problems.

'What we try to do is base our research on real problems and therefore there is very little of our research that does not have an applied value in the long term, but it is a matter of timescale,' he said.

Dr Walker said the work in the tropical north could be described as fundamental, for example, but it originated from real need for that knowledge in order to better manage the northern savanna woodlands.

The Division attracts about 16 per cent of its annual budget from outside sources including rural industries, the Australian National Parks and Wildlife Services, and State bodies. The level of outside funding is growing.

Dr Brian Walker

'The Division places considerable emphasis on maintaining close links with the present and potential users of its research,' Dr Walker said.

Dr Rhondda Dickson, the Division's industry liaison officer, has developed a brief for environmental consultants and potential collaborators which details areas of specific expertise within the Division.

The brief is being circulated with the objective of marketing the Division's unique ability to provide multi-disciplinary consultancy teams in fields such as vertebrate pest control, conservation management, land use planning and rangeland management.

Dr Walker said the Division was originally established in 1949 as the Wildlife Survey Section of CSIRO. Soon after it became the Division of Wildlife Research, which in 1982 amalgamated with the rangelands research programs based at Deniliquin and Alice Springs.

Under the planned restructuring of CSIRO the Division will acquire the Tropical Rainforest Research Centre and will change its name again.

Dr Walker believes the Division must look now at the consequences of global climate change on Australian ecosystems.

'Predicting how a changing global climate will impact on wildlife and land use will be a major challenge for the Division through the next decade,' Dr Walker said.

'The Division's work through the past 30 years has put it in a sound position to play a leading role, both in Australia and internationally, in this field.

'The climatologists need to give us more information, but the broad trends are already apparent,' he said.

'Early predictions are for a general warming of the Australian climate with the south-west becoming drier and much of the rest becoming wetter.

'To accommodate these changes wildlife and resource managers will need to know more about how plant and animal species will respond so that appropriate action can be taken to ensure their survival.

'It is obvious that there could be a major shift in cropping zones, which will have important economic and social ramifications.

'Similarly some areas now set aside as national parks and conservation areas may no longer serve their original purpose and therefore adjustments will need to be made,' he said.

Dr Walker said there were enormous opportunities for ecological research in Australia and it was only funds that prevented the Division from expansion into more areas. For instance, the Division was hoping to do more work on marine mammals.

A marine mammals workshop convened by Dr Walker last year, which involved research groups from around Australia, identified a number of important gaps.

'The workshop confirmed our view that there are areas that urgently need research but we will need complete external funding if we are to tackle them,' he said.

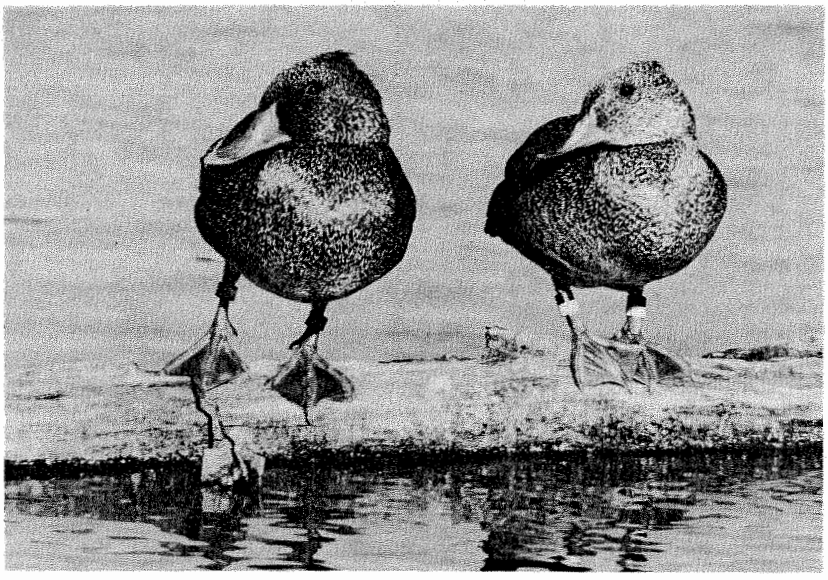
Dr Walker sees the Division playing a leading role in wildlife and ecological research in the years to come.

'The transfer of staff from the former Division of Water and Land Resources has significantly broadened the expertise of the Division.

'When the staff from the Tropical Forest Research Centre join us we will be even stronger. The Division has a high international reputation and there is little doubt that it is one of the leading ecological groups in the world.'

Breeding success with ducks

A colony of rare freckled ducks, established by Dr Peter Fullagar and Mr David Rushton, bred late in 1986 for the first time in near-natural conditions at Gungahlin.



Male, left, and female freckled ducks.

In biological terms the event was a coup of some magnitude as very little is known about the freckled duck and never before had they bred in conditions in which they could be closely studied.

The freckled duck has eluded close scrutiny mainly because they live in the remotest parts of eastern, inland Australia with lesser concentrations in the south-eastern and south-western parts of the mainland.

They are one of Australia's rarest and least known ducks and are listed among the ten rarest waterfowl in the world.

The colony that has now bred was established from eggs collected in 1983 from three nests located at Tongo on the Paroo River in the far north-west of NSW.

Waterfowl are normally ideal subjects for study as they behave and breed well in captivity, but, as Dr Harry Frith found in the 1950s and Mr Frank Crome in the 1970s, the freckled duck is an exception.

Wild-caught individuals, particularly females, may not breed for many years after capture, if at all.

The eggs collected in 1983 were artificially incubated and hand reared and it is the progeny of these that bred in near-natural conditions last year. Being able to collect eggs was in itself a significant achievement because very few sightings of nests had ever been reported by ornithologists.

Eleven young have now reached maturity, providing a wealth of data substantiating the notion that the freckled duck is not only one of the most primitive waterfowl in the world but that traditional speculation about its taxonomic position was misguided in the extreme.

It now seems the freckled duck is allied to a group of 'diving ducks' and speculation that it might be related to the swan now seems extremely unlikely.

The Gungahlin colony will be maintained as part of a long-term study to determine the relationships between moult cycles, hormone cycles and the change in bill colour in males, which is an indicator of the presence or absence of breeding readiness.

Division at a glance

As its name suggests, the Division of Wildlife and Rangelands Research has as its overall objective the understanding of the nature of Australia's ecological systems and their component species so as to provide a sound basis for the management and conservation of wildlife and land resources.

The wildlife focus involves an understanding of both the biology of wildlife species, including pest species, and of the ecology of the systems in which they occur. The rangelands focus involves an understanding of the ecology of the rangelands in the context of their management for conservation and for the production of livestock.

To meet these objectives the research of the Division is grouped into ten programs.

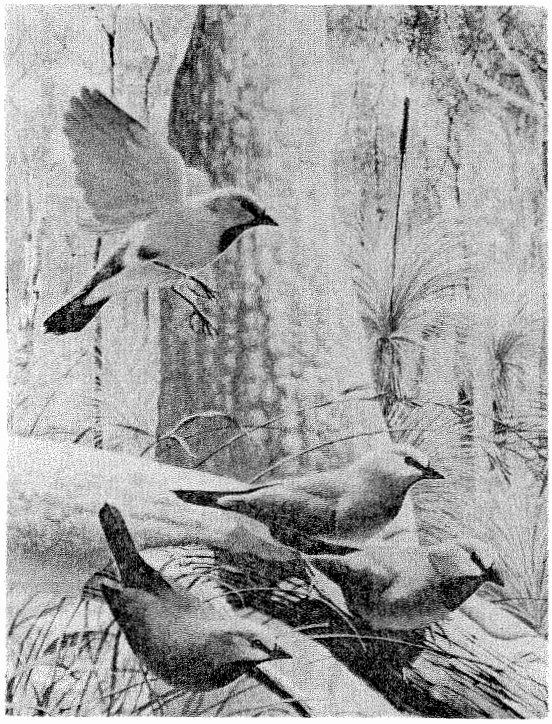
Six of these are based in Canberra. The remaining four are based at laboratories in Perth, Darwin, Alice Springs and Deniliquin. In addition, the Division has scientists located at Atherton and Sydney and maintains a number of semi-permanent field sites.

Artist's talents vital to research

For those familiar with the beautiful illustrations in books like *Kadimakara*, a recently published volume on extinct Australian vertebrates, the name Frank Knight will be well known.

Frank, now the Division's wildlife artist, joined CSIRO in 1959 as a technical officer. Frank's artistic talents were quickly recognised by Dr Harry Frith, the Chief at the time, and he moved from field to easel.

The talents of the artist are vital in wildlife research because the illustrations provide truly accurate representation of form and colour. Despite the advances in photographic technology, there are still problems in the comparison of animals caused by light and distance.



A plate for a book on Australian finches which will be written by a recently retired member of the Division's scientific staff, Dr Ken Myers, and his son David. The plate by Mr Frank Knight shows forms of the black-throated finch, Phoephila cinctus, in a woodland habitat from the northern end of its range.

Rabbits: still a major pest

Scientists with the Division are urging farmers to do more to control rabbits — still a major feral pest problem.

Dr Alan Newsome and Dr Steve Robbins, of the Vertebrate Pest Research Centre, said myxomatosis was still effective — despite the growing resistance of rabbits — but farmers needed to play their part.

They said:

- Farmers in some areas needed to do much more to control rabbits, including ripping of warrens, poisoning and fencing.
- Foxes, cats and dingoes can sometimes be useful rabbit control agents and consequently should not be routinely destroyed by landholders.
- Long-term research aims include studies to enhance the effectiveness of myxomatosis by manipulating the virus and by providing a better understanding of the ecology of the disease.

Myxomatosis was never intended to be the final solution to rabbits that some farmers believed. With growing resistance in some rabbit populations and the gradual weakening of virus strains, the continued use of conventional methods of control was vital.

'We know that myxomatosis is still suppressing rabbit populations in many areas and that without the virus rabbit populations would increase dramatically,' Dr Newsome said. 'But there is also evidence in certain areas that rabbit populations are developing increasing resistance.

'If farmers in areas where control measures are not prohibitively expensive fail to act and rabbit populations continue to develop resistance to myxomatosis, we could see an increasing problem with rabbits in the years to come,' he said.

The introduction of myxomatosis is one of CSIRO's greatest success stories.

Prior to the introduction of the virus rabbits caused enormous losses in primary production and threatened many areas with ecological disaster.

'In addition to myxomatosis, our research has led to the refinement of many other control methods and it is vital that farmers put this knowledge to use,' Dr Newsome said. 'Traditional methods include poisoning, ripping of warrens and fencing.

'In some areas, foxes, feral cats and dingoes can be additional pest control agents, significantly suppressing rabbit populations once their numbers are reduced by drought.

'While dingoes certainly are a serious pest in sheep country, farmers in other areas, particularly cattle grazing regions, should leave them alone.'

Dr Robbins said scientists with the Division were also studying the epidemiology and ecology of myxomatosis and hoping to develop more effective strains of the virus. One approach they were considering was the construction of virus strains by genetic engineering.

While the technology to develop new myxoma virus strains exists, Dr Robbins stressed that it would be years before such strains could be constructed, perfected, fully tested and released.

Division's historic headquarters

The Division's headquarters occupies an 80-hectare site in the northern suburbs of Canberra and includes the original homestead built by William Davis Jnr in the 1860s.

Davis built the two-storied, Georgian-styled homestead when the present Gungahlin property was part of a larger station known as Ginninderra.

In 1877 Davis sold the property to Edward Crace, who added a large, English-designed two-storey Victorian extension on the southern side of the original home.

Crace died in tragic circumstances in 1892 and his widow and manager managed the property until resumption by the Commonwealth Government in 1915. The Craces subsequently leased the property and surrounding land until 1928.

From 1928 to 1940 Dr Frederick Watson leased the property and from 1940 to 1949 the lease was held by Mr A J Kitchen.

After an unsuccessful attempt to auction the lease in 1949, the buildings and land were taken over by the Department of the Interior.

The department subsequently allowed the Canberra University College to use the buildings as a hall of residence for external affairs cadets.

Since 1953 the Gungahlin homestead has been occupied by the Division of Wildlife Research, which in 1982 was renamed the Division of Wildlife and Rangelands Research, reflecting the incorporation of the rangelands research programs at Alice Springs and Deniliquin.

The original Gungahlin homestead, together with the Crace addition, coach house, laundry block, original dam and planted driveway are part of the National Estate.

Since CSIRO's occupation of the site the homestead and remaining outbuildings have been used variously for administration and laboratories.

Other buildings have been added to the site, the most notable of which are a laboratory wing completed in 1980 and an animal house completed in 1982.

In keeping with the historic significance of the original buildings and surrounds a conservation and management plan was commissioned by the Department of Transport and Construction and developed by Philip Cox and Partners in 1982. Recommendations from the plan are now being implemented.

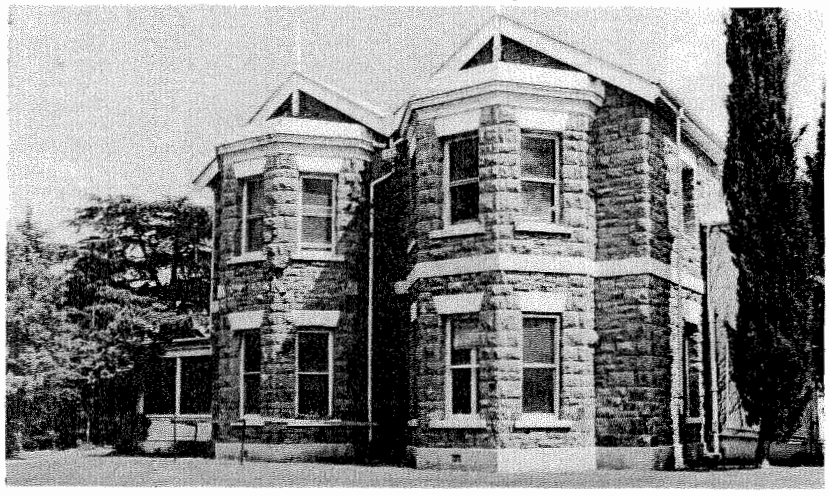
In the first phase the stone work on the Crace extension has been cleaned and repointed and rotting external woodwork replaced. Some work to restore internal rooms has also been completed.

The second phase, now underway, includes restoration of the entrance hall and staircase and the removal of several internal walls. Refurbishment of the interior of the building will be in keeping with the original decoration.

Work in the second phase will also include restoration of the external walls of the Davis section of the homestead.

When restoration is complete, which could still be several years away, the original buildings will form the administrative centre of the site.

The overall aim is to upgrade the rooms to modern office standards while maintaining the original architectural integrity for the future enjoyment of the widest possible cross-section of the community.



The southern facade of the Division's historic headquarters at Gungahlin, ACT.

Unique wildlife collection

The Division maintains the Australian National Wildlife Collection, a unique and valuable collection of specimens of frogs, reptiles, birds and mammals.

The collection contains some 60 000 specimens collected in Australia and Papua New Guinea since the mid-1950s.

It includes about 24 000 Australian bird specimens representing 670 species and 21,000 mammal specimens representing 185 species.

But the ANWC is more than simply an interesting collection, it is a valuable research tool actively used by scientists within the Division and from Australian and overseas institutions.

The collection of New Guinea birds is the largest held in any Australian museum, and the collection of bird skeletons is the largest outside western Europe and North America in both the number of specimens and species represented.

The curator, Dr John Calaby, said the greatest advantages of the collection were that all of the specimens had been gathered within the past 30 years and had fresh plumage or pelage, and the specimens had the most comprehensive supporting data of any collection.

'Other than taxonomy, the collections have important uses in the Division,' he said.

'The accurate identification of animals studied in the various divisional programs is central to the scientific validity and reputation of those studies.

'The reference collection must be sufficiently large to cover geographical, individual, sexual and age variation.

'Past work in the Division has brought to light some excellent examples of deficiencies of standard taxonomy, even in common large animals.

Dr John Calaby with specimens from the Australian National Wildlife Collection.

'Studies of tissue proteins associated with an ecological investigation of grey kangaroos showed that there were two species widely overlapping in range rather than one to five depending on the authority followed.

'Investigations of the ecology and behaviour of members of the crow family, undertaken because of their reputation as pastoral pests, demonstrated there were five valid species rather than three recognised in all reference works.'

Dr Calaby said similar studies of white-tailed black cockatoos, believed to be pests of plantation pines in south-western Australia, showed that there were two species in the region rather than one. One of these species had little association with pines.

Dr Calaby said specimens were often borrowed by Australian and overseas institutions for a wide range of studies.

'Biological mousetrap' proposal

A 'biological mousetrap' is under investigation as a means to prevent or dramatically reduce the impact of mouse plagues.

Dr Grant Singleton and Dr David Spratt at the rodent control research laboratory are studying the mouse-control potential of a nematode, or roundworm, called *Capillaria hepatica*, which lives as a parasite in the livers of rodents.

This parasite has a fairly complicated life cycle which involves a healthy mouse eating the body of an infected one.

The nematode exists in many mouse populations near the coast and in cities but is not prevalent in the mice of the cereal-growing regions where plagues most often occur.

Dr Trevor Redhead, who heads the mouse research, said his team realised that although the parasite kills some of its hosts, it could never achieve the high kill rates of, for example, myxomatosis.

However, they have found that infection significantly reduces the litter size and survival of the young.

This is important because Dr Redhead's work on mouse plagues suggests that unusually high average litter sizes determines the severity and timing of a plague.

'Reducing productivity may allow us to keep mouse numbers below a certain critical threshold — the level at which a plague becomes inevitable,' he said.

But there is still a long way to go before the 'biological mousetrap' becomes a reality.

The scientists believe that the nematode is unlikely to establish itself permanently in native mammals, but more work needs to be done in this area before the parasite could be used.

The researchers envisage that the parasite will be used only at certain crucial times, when monitoring suggests a plague may be in the offing. It is not expected to remain permanently in the mouse population.

Although this tactical response may sound awkward, it would certainly represent an improvement on present control measures.

Innovative fund allocation plan

A new scheme of allocating funds to projects based on an individual researcher's publication record, research significance and contribution in terms of 'communication' has been instigated by the Division's Chief, Dr Brian Walker.

The aim of the scheme is to ensure that the appropriation funds available for research are allocated in a way which best meets the objectives of the Division.

'The likelihood that a particular project will contribute significantly to our objectives depends on two equally important factors — the researcher and the nature of the project,' Dr Walker said.

To arrive at a research accountability score each scientist is assessed via a simple formula where research accountability is equal to a composite score for research effect, scientific publication and communication.

Weightings are given to each category with research effect and publication both attracting a maximum score of 20 and communication a maximum score of 10.

Research effect takes account of how an individual's work has influenced policy or resource management, how it has been applied in other ways for the benefit of the community at large, or how it has influenced other scientists. The science citation index is also used as part of the assessment of this component. Publications are rated according to significance.

The communication component takes account of an individual's contribution to committees, official management duties and media activity which may reflect more generally the activity of the Division.

The system accommodates new and younger scientists by awarding them average scores.

The fact that some research projects are intrinsically more expensive than others is also accommodated via a discretionary pool of funds allocated by Dr Walker.

'The accountability scores serve as a guide as to what projects should be funded and at what level to achieve the greatest benefits in terms of research effectiveness.

'Having a discretionary fund taken from the top of the budget allows sufficient flexibility to smooth out anomalies and to promote new initiatives and priority research,' Dr Walker said.

Dr Walker said the system, now in its third year, had been well received by professional staff and was a useful tool.

'It works well for this Division but I would not necessarily recommend it for other divisions where resource allocation requirements might be quite different,' he said.

Ms Michelle Leishman, technical assistant in the rodent control research laboratory, checks a radio collar.

Communication is a priority

In many ways the Division is fortunate in that the product of its research impinges on the lives of all Australians... there would be very few who would admit to having no interest at all in the well-being of Australia's unique flora and fauna.

There is also a growing worldwide interest in Australia's potential for providing a wilderness experience. The ethos of the 'bush' lingers with many Australians and has been rekindled in others in recent times.

The Japanese fascination with the koala and frilled lizard, and the American euphoria over a *Crocodile Dundee* lifestyle are all pointers to the importance of Australia putting in place appropriate management strategies for its natural estate.

Within the Division there is therefore recognition of an obligation to communicate the results of its research effectively.

The Division has three broad audiences — the community at large, the State and Territory agencies largely responsible for managing wildlife and land resources, and other researchers variously located in State agencies, universities and museums. Many of the latter are often collaborators.

Collaborative research is a major means by which the Division reaches its primary audiences, but equally important are a publications program, media, workshops and field days.

Field days are a particularly important adjunct to several of the Division's research programs.

The Deniliquin Rangelands program, which presently concentrates on a range of issues in the mulga woodlands of eastern Australia, is highly interactive with the landholder community and extension agency personnel.

Over recent years a number of field days have been staged at various research sites to report progress and to seek feedback.

For example a field day was staged recently at the Division's research site near Louth in western NSW for members of the Production Committee of the Wool Research Trust Fund. The Trust supports some of the research in progress.

A similar event had previously been organized for local graziers and extension agency people.

The research at Louth is investigating the effect of kangaroo grazing on sheep carrying capacity. This project is complimented by investigations into the effect of management strategies on the long-term productivity of the soils, development of interactive, computer-based management models and development of systems to utilise Landsat imagery to chart changes in the vegetation structure.

As a package the work is a significant contribution to the knowledge base of how the mulga ecosystems function.

But its true value will only be realized when those who directly manage the land modify their management practices in the light of new information resulting from the research.

In Western Australia the Division's staff also believe in the value of field days and have recently participated in events staged at Dowein, Newdegate and Mingenew — the west's equivalent of the Orange National Field Days and Gunnedah's AgQuip, both in NSW.

The Division's research in the west is centred on the conservation and management of remnant patches of native vegetation including road reserves.

NT research programs

The Division has researchers working on both wildlife and rangelands research in the Northern Territory.

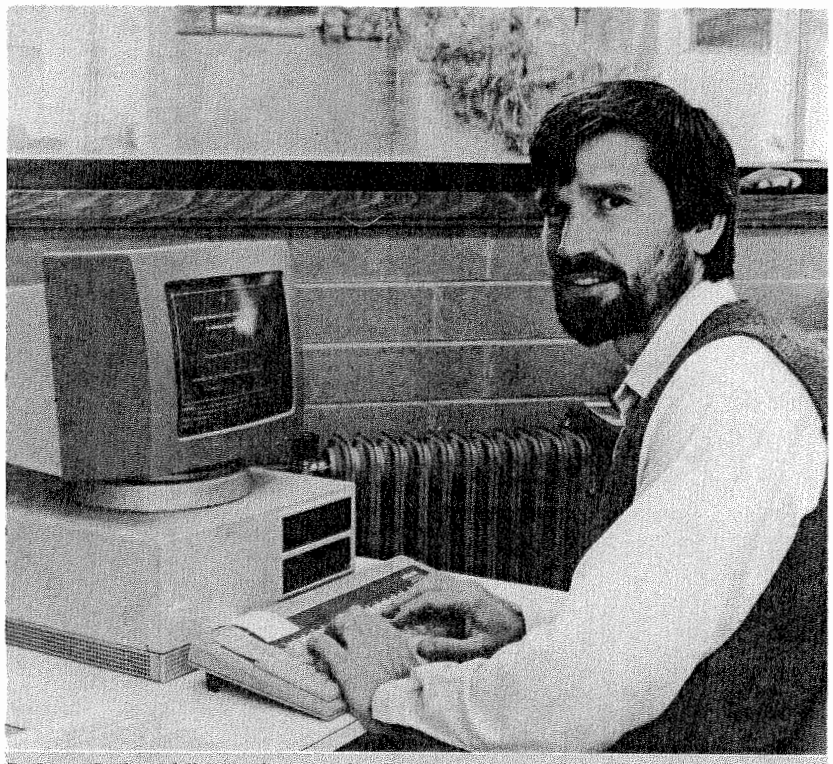
All rangelands research staff are located at the laboratories in Alice Springs and five scientists and ten technical staff operate from Darwin.

All projects undertaken by the Darwin staff are concerned with the ecology of the wet-dry tropics. Most are based at Kapalga, a field research station in Stage Two of Kakadu National Park.

At Kapalga, the scientists are studying the relationships between wildlife, feral stock, invertebrate animals, vegetation and the physical environment.

To date most studies have concentrated on the coastal wetlands and on the effects of water buffalo on the area.

Attention is now being focused on the development of an integrated research program on the tropical ecosystems of the Top End.



Dr Roger Pech modelling feral pig populations.

Fight against feral pigs

The Australian economy is vitally dependent on its livestock industries remaining free of major exotic diseases.

An outbreak of foot and mouth disease, for example, is likely to cost Australia 16 per cent of its national export income or $6 billion during the first year, even if the outbreak is immediately contained.

If the disease persisted there could be continuing costs of $316 to $3740 million per year. The actual amount depending on whether the disruption to trade was confined to just one region, such as the Northern Territory, or Australia-wide.

Increased quarantine measures alone cannot counter the increasing risk of an outbreak of an exotic disease occurring and improved preparedness is therefore necessary for both control and eradication procedures.

Because feral pigs are regarded as one of the most important potential transmitters of FMD throughout much of northern and eastern Australia they are the subject of research within the Division.

Dr John McIlroy and Dr Roger Pech at the Division's Gungahlin laboratory are investigating methods of preventing or eradicating exotic diseases amongst feral pigs in Australia.

A computer model that describes the likely establishment and progress of an outbreak of FMD within a feral pig population has been developed.

The first model is based on the semi-arid woodlands of NSW. Further models are now being developed for other areas of Australia where feral pigs occur and for other potential hosts such as buffalo and feral cattle.

The initial model revealed that there are significant gaps in present knowledge about the attributes of feral pigs and FMD, which are important in disease prevention and eradication.

It quickly became apparent that more information was needed about the movement patterns of pigs, how they came into contact with each other and the process of disease transmission.

The model also identified the fact that all recent disease eradication exercises, in which kill rates ranged from 20 to 94 per cent, would probably have failed in their objective because rapid eradication of FMD requires a kill rate of more than 95 per cent.

Management options such as surveillance and risk reduction, which could either prevent outbreaks of an exotic disease or increase the probability or eradicating such a disease should it occur, are also being investigated.

Surveillance involves routine sampling of feral pigs for FMD, particularly in areas considered to be key or high risk areas. Risk reduction involves the control of feral pigs, especially in high risk areas, to reduce the possibility of an outbreak of FMD.

Some of this work includes designing and predicting the success of sampling strategies for disease detection, evaluating the feasibility and cost of reducing the density of feral pigs to below the estimated threshold level of FMD to persist, and determining the optimum allocation of effort between surveillance and control strategies.

According to Dr McIlroy, an important part of the work is the testing of control strategies under field conditions.

Research to date has been carried out in the more heavily forested coastal and tableland areas of eastern Australia.

In these areas poisoning will probably remain the principal control method as research has shown that hunting pigs with dogs and trapping are both ineffective for rapid reduction of pig numbers.

Poisoning campaigns are not always successful and therefore Dr McIlroy sees a need for more research on baits and attractants.

###

This feature is designed to present a cross-section of activities at the Division of Wildlife and Rangelands Research and is not intended as a directory to all services. Call Peter Lynch on (062) 421615 for more information.

The photographs in this feature have been contributed by Graeme Chapman.

Budget comment
Cont. from p.1

budget had removed every bit of flexibility' he had to redeploy funds within the Division. Funds made available through ESIS and other redundancies, originally earmarked for use in boosting research programs, must now be used to balance the books. An additional $20 000 will also be lost, said Dr Mahoney. He said the Division would get by because it had had big salary savings, but he is one of many chiefs concerned about the long term future. For instance, his Division needs $250 000 each year for repairs and maintenance, and this is just not available. The rundown in vital facilities must have an effect on research programs. He has been fairly successful in replacing appropriation funds with external funds, and this year he will not have to close programs, but next year is another story. With appropriation funds falling and costs rising, and the fact that basic research is not, by its nature, able to attract external funding, it's the basic research that will be the first to go. Companies or funding bodies want to see their money accounted for 'at the workface', he said, not in long term research which may take years to show a result. Already the Division is high up in the level of external funding, with 25 per cent, and Dr Mahoney believes this can be pushed even further to 30 per cent, especially if he can tap into the venture capital market.

Dr Lex Blakey, Chief of the Division of Building Research, said all the Division's programs had at least an element of industry support, and with less funds and less staff the Division would now have to withdraw from some arrangements with industry. He has had to leave 15-20 positions vacant, and this has had an impact on the ability to carry out all the aims of the programs. Currently DBR receives eight per cent external funding in money terms and 'heavy support' in kind.

Dr Des Walker, Chief of the Division of Food Research, says he's 'mystified' by how the Government can claim that it's encouraging economic growth through far greater exports and added value, yet it is undermining the science and technology input needed to boost Australia's export performance. Although his Division has been protected from the estimated five to six per cent cut in appropriation funds dealt to many divisions (his cut will be around 2.5 per cent), the past 10 years has seen an almost unbelievable reduction in programs and staff resulting from successive cutbacks. For example, a review of operations in the face of tighter times resulted in more than 100 projects being cut down to 14 projects. Dr Walker said he had intended boosting these projects with funds released as a result of ESIS, but this has not been the case. He describes ESIS as 'a fraud', saying that while last December he released 12 positions, he will only gain two minor positions. Over 10 years the Division has lost more than 60 positions, and this has had a severely damaging effect on the research work able to be done at the Division. He had hoped that ESIS would create the opportunity for the employment of young, energetic scientists, but so far this had not happened. All this time, he said, the Division had been chasing external funds, and what could be obtained had been.

Dr Trevor Scott, Chief of the Division of Animal Production, has progressively been 'paring things to the bone', and the latest budget has come as a blow. In fact he's one of several Chiefs who have described the consequences of the budget as 'disastrous', with an estimated seven per cent cut. Dr Scott said this will eventually be a real cut of 10-12 per cent for his Division, once other factors such as inflation are taken into account. This will have a major effect on the Division's research program in both the short and long term. 'CSIRO has changed a lot in recent years, becoming more goal oriented. But we have got to be able to preserve basic science. The pendulum may have swung too far — 10 years ago we needed more external input, but now we may be going too far in the other direction,' he said. His Division is one of the top earners of external funds, with 36 per cent of its funding from outside.

Dr Brian Tucker, Chief of the Division of Atmospheric Research, is concerned about the fate of CSIRO's environmental divisions. Although there has been considerable publicity about environmental issues in recent times (e.g. the greenhouse effect, the ozone layer, etc) this greater awareness and quest for knowledge has not been matched by increased or even static funds. Dr Tucker said the work done at DAR was not recognised in any CSIRO growth area. 'The Organisation's attitude to environmental divisions is poor,' he said. Dr Tucker said DAR does not have recourse to big industry for funding. At present, his Division receives about 10 per cent of its money from outside. Dr Tucker is now working out how to apply the latest cuts, which would virtually wipe out his discretionary operating funds. Already, natural attrition and ESIS have decimated his staff complement, with a 20 per cent reduction in the number of staff in the past four years.

Coal agreement to counter 'political leverage' by competitors

The Division of Fossil Fuels and the Australian Coal Industry Research Laboratories (ACIRL) have formed a new coal research consultancy.

The joint venture, Coal Processing Consultants (CPC), was launched on 28 August when the agreement was signed by Mr Owen Richards, ACIRL General Manager, and Professor Ming Leung, Chief of the Division.

The consultancy aims to provide marketers and users of Australian coal with the most effective and timely solutions to their technical problems.

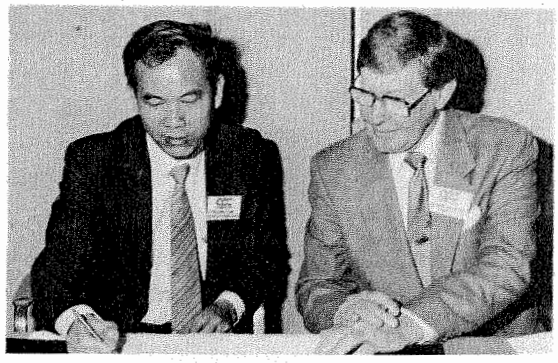
Both partners will pool their combined resources to tackle projects in coal testing and evaluation, coal utilisation research, coal preparation and upgrading, conversion, transport and storage, and environmental control.

CPC hopes to negotiate more than $1 million worth of consulting in its first year of operation.

After the signing ceremony, the Australian Coal Association's Deputy Chairman, Mr Ian Dunlop, said the coal industry had reached 'the most critical point in probably two or three decades'.

He said that, to counter the 'political leverage' the industry's traditional competitors were using, the only option was to provide a better quality product at a better price.

The CPC joint venture was intended to be a significant part of the effort needed to achieve this aim.



Professor Ming Leung, Chief of the Division of Fossil Fuels, and Owen Richards, general manager of Australian Coal Industries Research Laboratories (ACIRL), sign the agreement launching the CPC joint venture.

Schedvin history of CSIR out next month

The first comprehensive history of CSIRO's predecessor, the Council for Scientific and Industrial Research (CSIR), will be published and available from the CSIRO Bookshop in early November.

The book, *Shaping Science and Industry*, is the first of two volumes on the history of the Organisation and covers the period 1926 to 1949.

Professor Boris Schedvin, of Melbourne University, has written the book. A specialist on the history of the Australian economy in the 20th Century, Professor Schedvin is well qualified to write about the relationship between science, technology and the economy.

Shaping Science and Industry touches on many aspects of Australia's intellectual, political and economic life.

It is concerned with CSIR's struggle to introduce excellence in the pursuit of scientific research for industry and the cultivation of a powerful scientific ethos within the organisation.

An account is given of the way CSIR was influenced by men and ideas imported from Britain, of the difficulties of forming working relationships with State departments of agriculture, and of the evolving interface with the universities.

The contributions of many outstanding scientific personalities are described, including Sir George Julius, Sir Charles Martin, Hedley Marston, D F Martyn, A E V Richardson, Sir David Rivett, Sir Ian Clunies Ross and Sir Frederick White.

In his account of the development of research programs Professor Schedvin explains the preoccupation with research for agricultural industries, especially livestock production.

An informative and non-technical account is given of such major programs as the eradication of prickly pear, control of animal diseases such as bovine pleuro-pneumonia, the discovery of mineral deficiency in animals and plants, the attempt to control sheep blowfly, and the introduction of Zebu cattle to Queensland.

Shaping Science and Industry also recounts the rapid growth of CSIR during World War II. This includes the major effort to introduce and adapt radar technology, the establishment of national standards, and research in relation to aeronautics, industrial chemistry and materials science as part of the war effort.

The second volume, which will cover the period from 1949 to 1978, will be available in about two years.

Shaping Science and Industry
A History of Australia's Council for Scientific and Industrial Research 1926 — 1949
C. B. Schedvin
Recommended Retail Price $ 29.95
less 25 % discount to CSIRO employees
Order to: CSIRO Bookshop
314 Albert Street, East Melbourne, Vic. 3002

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Honours and Awards

The Institute of Foresters of Australia has awarded the N W Jolly Medal, its highest award for merit in forestry, to Dr Alan Brown, acting Chief of the Division of Forest Research.

Dr Brown's major scientific work has been concerned with the development of the breeding population of *Pinus radiata*, and the selection and implementation of a breeding strategy for the species.

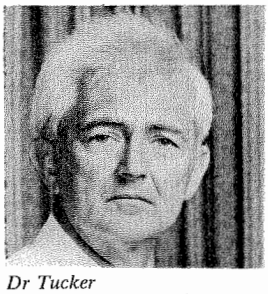
In the award citation, the institute said Dr Brown's achievements in 'the professional, public and personal arenas of life have been remarkable'.

'He is a highly professional forester with great human warmth and sensitivity who has made a major contribution to Australian forestry. He is well deserving of this award.'

Dr Brown, in a letter to the institute, said achievement in a career reflected the work environment.

'In my case I have been fortunate to have been with a wide circle of people who have not only made that work enjoyable but have contributed greatly to the outcome,' he said.

I am therefore honoured to have received the Jolly medal, not only on my own account but because it inevitably reflects the attainment of the Division as a whole.'



Dr Tucker

Dr Brian Tucker, Chief of the Division of Atmospheric Research, has been elected President of the International Association of Meteorology and Atmospheric Physics.

The association is the major international agency dealing with the scientific aspects of meteorology. Dr Tucker's appointment was announced at the general assembly of the International Union of Geodesy and Geophysics in Vancouver, Canada, last month.

Dr Tucker said his appointment was a recognition of the quality and high international standing of Australian atmospheric science.

'The election couldn't have come at a better time, given that environmental research in Australia is currently suffering budget cutbacks,' he said.

'Perhaps the international recognition will bring home the message that we are doing first class research, research which benefits all Australians, and which has an enormous value but one that cannot always be measured in terms of dollars and cents.'

Prize for Nestel

The Chief of the Division of Human Nutrition, Dr Paul Nestel, has been awarded a major international prize.

Dr Nestel is the first Australian to receive the award from the Swiss-based International Foundation for the Promotion of Nutritional Research and Nutritional Education.

It was made in recognition of Dr Nestel's 'outstanding contribution to nutrition and atherosclerosis during the last five years'.

Dr Nestel was appointed Chief of the Division in January 1986. He was formerly the Deputy Director of the Baker Medical Research Institute in Melbourne.

Dr Nestel also heads a research program entitled nutritional regulation of metabolic processes related to cardiovascular disease.

Dr Nestel has been invited to collect the prize and deliver a lecture at the foundation's annual meeting to be held this month in Italy.

###

The Chief of the Division of Oceanography, Dr Angus McEwan, has been appointed Chairman of the Committee on Climate Changes and the Ocean.

The committee is a specialist committee of the Scientific Committee on Oceanic Research (SCOR) and the Intergovernmental Oceanographic Commission.

The two-year appointment was made at the committee's 8th meeting, which was held in Kiel, West Germany. Dr McEwan is Australia's delegate to SCOR.

Letters

Cont. from p.2

talent that resides within it, and even though the Shadow Ministry responsibility now lies with my colleague Warwick Smith, I will welcome the opportunity to be of service to the Organisation and its members, at any time.

Brian R Archer
Senator for Tasmania

Dear Editor,

It would appear that *Co-Research* has so little confidence in CSIRO's Major Restructure that it considers that the days of the Organization (I stick to a 'z') are strictly numbered.

How else to explain the decision to start a 'count-down' for the paper: No. 303 for June/July; No. 302 for August; all the way down to No. Zero for ??? (I leave that for Maths/Stats to work out).

Herman Haantjens
Broulee

(Editor's note: sorry, the gremlins got into the numbering system.)

OHS

Cont. from p.2

The types of programs which have been implemented to some degree in most organisations are:-

*health fitness assessment counselling
*dissemination of literature
*blood pressure monitoring
*physical activity
*smoking cessation
*stress management
*nutrition

Gary Knobel
OHS Unit

Pittock publishes 'hopeful' book on nuclear winter

Senior researcher at the Division of Atmospheric Research, Dr Barrie Pittock, has written what's described as a 'hopeful' book about the possible consequences of a nuclear war.

The book, called *Nuclear Winter in Australia and New Zealand — Beyond Darkness*, concerns how the nuclear winter came to be 'discovered', how it might come about and what it would be like, focusing on the possible impacts on Australia and New Zealand.

Beyond Darkness attempts to answer commonly asked questions about whether we might survive a nuclear war and suggests what we can do to prevent and, if necessary, survive nuclear winter.

It is an authoritative and balanced account of the scientific basis of nuclear winter and its biological effects from an acknowledged expert on the subject. It is written in plain language.

The book is available from bookshops around Australia for a recommended retail price of $9.95.

NOTE: Space constraints did not permit us to run several important 'people', and other, items in this issue. They will appear in November.

Called 'the best attended event on the Sydney CSIRO social calendar', the North Ryde Fun Run certainly lived up to its reputation this year, its fifth. There were 219 entrants for the run, which is now being sponsored by the Laboratories Credit Union. The 1987 winner of the Credit Union Prize was Mineral Physics, represented by Peter Eadington, Gary Cripps, Andrew Taylor and Alfredo Quintana (see above). They will represent Mineral Physics and CSIRO Sydney in the 1988 Black Mountain Fun Run. Look out Canberra.

Quintuple retirement at Radiophysics

The Division of Radiophysics recently lost five long-serving members of staff.

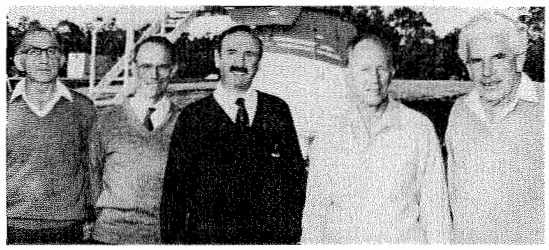
Retiring with a combined service record of more than 160 years were Mr Don Yabsley, Dr Jim Roberts, Dr Max Komesaroff, Mr Warren Payten and Mr Geoff Crapps.

Mr Yabsley was a vacation student in 1943 and joined the Division in 1944. Some of the earliest solar radio astronomy papers show Mr Yabsley was one of the leading investigators in this field in the late 1940s.

More recently he has played a leading role in the design of reflector surfaces for the Australia Telescope.

Dr Roberts started as a vacation student and returned to the labs in 1952.

In the early 1950s his work helped pioneer smoothing techniques in radioastronomy. Until his retirement, Dr Roberts provided a final check on all papers issued by the Division.



Left to right, Max Komesaroff, Don Yabsley, Geoff Crapps, Jim Roberts and Warren Payten.

Dr Komesaroff joined the Division in 1953. He became an expert on Jupiter at Parkes in the 1960s and was one of the first researchers working on pulsars.

Mr Crapps originally worked on the radioheliograph at Culgoora, NSW. After the closure of the heliograph, Mr Crapps moved to Epping as clockmaker for the Australia Telescope.

Mr Payten has been associated with Culgoora since the first survey peg. He oversaw the construction of the radioheliograph and was has been closely involved with the construction of the Australia Telescope.

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***CoResearch* is produced by the Public Communication Unit for CSIRO staff. Readers are invited to contribute or offer suggestions for articles. The deadline is the last Monday before the issue month. Editor: Liz Tynan, PO Box 225 Dickson ACT 2602. Ph: 48 4479.**

CoResearch

CSIRO's staff newspaper

No. 307 November '87

Consulting body

Natural resources divisions move to get more outside funds

Moves are underway to establish a natural resource consulting consortium, possibly within Sirotech, to help CSIRO divisions tap into the existing multi-million dollar international consulting market.

Supporters of the plan hope money from the proposed venture will boost the external earnings of CSIRO's environmental and agricultural divisions, many of which currently have limited access to outside funding. CSIRO policy now demands that divisions seek a greater percentage of non-appropriation funds.

A meeting of senior divisional, institute, Centre for International Research Co-Operation (CIRC) and Sirotech staff in Canberra last month discussed the results of a feasibility study which examined the proposal.

The study was conducted by Ernst & Whinney, a management consultant firm contracted by Sirotech on 31 August this year.

The original idea for the venture came from chief research scientist at the Division of Atmospheric Research, Dr Garth Paltridge. He proposed that it proactively seek out, tender for and manage national and international consulting projects utilising the expertise available in a broad range of natural environment divisions.

He envisaged it would act as a commercially-hungry marketing arm for the divisions, in the style of typical consulting engineering firms. In the first few years at least it might work on a joint venture basis with existing Australian consulting firms who would have the depth of experience in the field needed to effectively market CSIRO's expertise.

Divisions (and units), represented at last month's meeting were: Fisheries Research, Entomology, Forest Research, Soils, Tropical Crops and Pastures, Water Resources Research, Wildlife and Rangelands Research, Centre for Freshwater and Irrigation Research, Atmospheric Research, Environmental Mechanics, Information Technology, Oceanography and COSSA.

Mr Peter Chomley from Sirotech said the workshop had been very successful and support was certainly there among participants for a consulting entity. It was now a matter of determining what shape it should take.

The Ernst & Whinney report strongly urged seeking work in the international market for environmental and agricultural consulting, which is estimated to be worth $37-$50 million each year. The domestic market was put at $3-$5 million.

Acting director of the Institute of Biological Resources, Dr Joe Landsberg, was in favour of the proposal, believing it to be desirable to have available a formal mechanism to market skills, specifically target projects and make CSIRO's expertise known.

He said it would be extremely beneficial to give researchers the opportunity to get out of their laboratories more and into the wider international field. Among a number of benefits, this would greatly boost technology transfer.

'In addition, it would give greater commitment to the application of research and sharpen the perception of researchers about important problems,' he said.

Progressive ideas

Dr Landsberg said scientists in divisions have had to change their thinking away from the idea that the pursuit of scientific knowledge alone was sacrosanct and adopt more progressive ideas. An example of this has been the greater emphasis on and commitment to communication. The creation of a consulting arm would be another example of being receptive to new ideas, he said.

Dr Neville Fletcher, director of the Institute of Physical Sciences, also supported the concept of a consulting body, although with some reservations about funding.

He said he would be most in favour of either an agency arrangement with an existing consulting firm, with CSIRO acting as a sub-contractor, or an entity set up as a branch of Sirotech.

While there was broad support among those at last month's meeting for increased co-ordination and professionalism in CSIRO's consulting activities, some questions have been raised about the type of body proposed.

Another Sirotech official, Dr David Wilson queried the wisdom of creating a separate entity to handle CSIRO's consulting, believing that the overheads involved may well outweigh the potential gain.

He also said he was concerned that CSIRO not eventually get to the stage where it was competing with Australian companies for consulting work in low tech areas, as he believed this would conflict with its charter.

He said however that CSIRO did need to make its consulting work more professional, by 'upping the ante', being more selective and more commercial.

Dr Barry Filshie, officer-in-charge of CIRC, agreed with the need for greater professionalism in the Organisation's approach to international consulting.

'Alongside CIRC's other international responsibilities we have been systematically developing a strategy for increasing CSIRO's market share of consulting work. We have developed a computerised database of CSIRO expertise, registered CSIRO with the major development banks and UN agencies and are now forging greater links with Australian consulting companies, Austrade and our overseas trade representatives.'

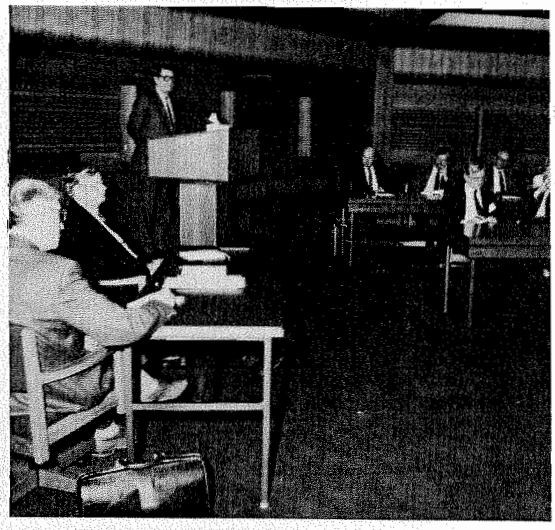
Dr Filshie raised some doubts about the viability of a separate consulting venture funded from the proceeds of more consulting work.

'The proposal would require a long term and highly sustained commitment, and I don't think the Organisation can afford it right now,' he said.

'It would run the Organisation into debt until the business is built up, and the cost of building up business is extraordinarily high,' he said. 'There is enormous competition. For example, the Asia Development Bank has about 9000 consultants and 1500 firms registered for consulting work.'

Cont. on p.7

Wran addresses chiefs



Mr Wran speaking to chiefs at last month's meeting.

The Chairman Mr Wran said lasting and beneficial change to CSIRO, in line with Government guidelines, couldn't be achieved without hard decisions being made.

Speaking to division chiefs in Canberra late last month, Mr Wran said 'the Board has been set tasks to do and objectives to achieve, some of which have been extremely difficult.

'The restructuring of CSIRO will complement those aims by ensuring the Organisation is focused on the long term needs of its customers,' he said.

'Performance in seeing the results of research transferred into practical use will be substantially upgraded.'

'Program management will be upgraded throughout the Organisation and administrative overheads will be reduced.'

A goal of 30 per cent outside funding to be achieved in a maximum of three years is one of the major requirements of the Government.

'That's going to be an immense task, but immense as it is, it certainly isn't impossible.

'It means there will need to be neat and sensitive judgements made as to the distribution of funds between institutes and at institute level between divisions because some divisions are just not pursuing investigations and projects that are amenable to outside contribution,' he said.

Mr Wran said the commitment to excellence in research was unshakeable among Board members.

'Without pure research there is no point in having an Organisation like CSIRO, and there is no way within the policy articulated by the Government that the Board will be a party to the sacrifice of pure scientific research in CSIRO.

###

Film award

The CSIRO Film & Video Centre has added to its already impressive collection of honours with an award from an international film festival.

Green Envoys, screened nationally on the ABC *Quantum* program in October last year, took out first prize in the Best Documentary Film category at Agrofilm '87. This festival is held every year in Czechoslovakia for films on agriculture, forestry and the environment.

Greenhouse 87 conference

The Division of Atmospheric Research has organised a five day conference to discuss the impacts of climate and sea level change resulting from the 'greenhouse effect'. The conference, called Greenhouse 87, **will be held at Monash University 30 November — 4 December. For more information contact Ms Val Jemmeson or Dr Willem Bouma at DAR, 03–586 7666.**

From the Chief Executive

A column by Dr Keith Boardman

I was delighted with the universal acceptance of my invitations to distinguished individuals to join the selection committees for the directors of the new institutes. I believe that the ready willingness of top leaders from industry and the community to join with CSIRO Board members in this most important task reflects the high standing of the Organisation and a recognition of the vital role to be played by CSIRO in the future prosperity of the nation.

Six committees have been established for the institute director positions, and I am now finalising the selection committee for the corporate positions. Each institute director committee is meeting relevant chiefs to obtain their views on questions of institute management and leadership, the qualities to be sought in a director and the relationship between a director and the chiefs of his/her institute. The meetings held so far have been extremely valuable to the selection committees. The chiefs have shown a commitment to work with their new directors to achieve the combined leadership and management skills needed to stimulate outstanding achievement by the staff, and a coherent approach to planning, resource allocation and promotion of the work of the institute.

The committees' interviews with shortlisted applicants will take place this month for five institutes and during the first week of December for the sixth. This will enable final decisions by the Board at its meeting on 14 December. The new institutes come into being on 1 January and it would be highly desirable if all directors could take up their appointments from the beginning of the new year. The past three years has been a period of uncertainty for the Organisation, and I know that all staff look forward to a period of stability.

Team effort and an acceptance of 'shared values' will be crucial to the success of the restructured CSIRO. I am planning a residential meeting with directors over a few days in February and away from the Canberra headquarters. I will be strongly urging directors to have similar meetings with their chiefs to promote better team effort in the institutes. I am looking for better relations between management and the staff associations. Improved internal communication will be an important element in achieving these.

The implementation of the decisions from the institute/division structure and model institute study are being managed by the 'change implementation group' chaired by me and with Carmel MacPherson as our energetic project leader. Much remains to be done if we are to achieve a smooth transition to the new structure on 1 January. The review of the corporate centre and corporate services is progressing well, and I thank all staff concerned for their co-operation in providing information to the project team.

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I attended the seminar at the Division of Radiophysics on 7 October on the opportunities of gallium arsenide as complementary to silicon for integrated circuits. Mr Ken Taylor from Henderson Ventures in California provided an overview of the world scene, and concluded that there were good prospects for an enterprise in Australia based on the work of the Division of Radiophysics. But the opportunity must be pursued vigorously if an Australian enterprise is to be successful in world markets.

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I have a busy program in the next two weeks with meetings of the Board, chiefs, director selection committees and addresses to the Federation of Australian Scientific and Technological Societies, the National Conference of Deans of Science, the Australian Industrial Research Group, the Australian Institute of Nuclear Science and Engineering, and a Coopers Lybrand seminar on offsets opportunities and the role of venture capital in the funding of R&D.

There is much interest currently in the reorganisation of CSIRO and strategies for improving the allocation of resources and the management of research.

N Keith Boardman

Gallium arsenide

A business plan has been commissioned to examine establishing a commercial venture to further develop CSIRO's gallium arsenide technology.

***A feature on CSIRO's gallium arsenide project will appear in the next* CoResearch.**

Dr Charles Gerrard, acting program leader (life cycle performance) at the Division of Building Research, recently attended the pilot three-day project management workshop held in Canberra (see* CoResearch *303, June-July '87). He has summarised his thoughts following the workshop in these 11 points. Comment from readers through the Letters to the Editor section would be welcome.

1. The long term viability of CSIRO depends on its ability to deliver relevant research findings to Australian industry, interest groups and the community at large.
2. These findings must be presented in a form that enables ready application.
3. Almost without exception, the positive attitudes towards CSIRO that exist in industry, interest groups and the community can be traced to the outcomes of successfully conducted research projects.
4. In terms of CSIRO's 'markets' it is research projects that are fundamental. The hierarchy above project level, of programs, divisions and institutes, are mechanisms of management.
5. One important consideration in the definition of a research project is that its objective should be readily understood by one or more sectors of CSIRO's 'market'. This would maximise the potential for the ready application of research findings. On this basis, both the duration and the rate of application of resources to various projects would vary significantly. Internal management methods must be developed to cope with this in order to take full advantage of an enhanced external credibility.
6. Essentially, all of the work of CSIRO should be contained in research projects. These will vary from tactical, to strategic, to basic. In the last case, these may aim to keep at the forefront of defined sectors of science over an extended time scale.
7. There are only two basic questions for CSIRO: (a) the selection of research projects, and (b) the management of research projects.
8. The responsibility for the selection and management of research projects should be shared, in a clearly defined way, between project managers and the CSIRO hierarchy above them.
9. The role of project managers is of central importance in CSIRO. It should cover a significant contribution to project selection and management and, on a day-to-day basis, total responsibility for project budgeting and accountability. Appropriate support needs to be provided to enable this role to be efficiently performed.
10. The main role of the CSIRO hierarchy, above project managers, should be to facilitate the efficient operation of project teams and to supervise the selection and management of research projects.
11. Serendipity arises during the conduct of research projects. Research management should aim to constructively harness serendipity. This will provide the opportunity to open new research areas for only incremental costs and will significantly enhance the professional satisfaction of project teams.

Dear Editor,

The demand that CSIRO now earn a substantial part of its funds from industry must be seen as a hidden form of privatisation. It is therefore appropriate to look at the criteria put forward by the Prime Minister at a recent Labor Party Conference when talking about the privatisation of some government services. He asked, firstly, whether the service would be supplied at all if the government did not do it, and then if the answer was yes, why the government should do it? These criteria should be applied to government funding of research in CSIRO.

What are the areas of research which would not be done unless they were done in CSIRO with government funding? They are those areas which deal with national resources and which require large multidisciplinary teams. As an illustrative list, which is not meant to be comprehensive, I would suggest this means the areas of research which were covered by the old divisions of Atmospheric Research, Oceanography, Water, Building Research, Wildlife, and Information Technology. No doubt everyone would propose a different list, but this does not alter the principle that there is a core of research which must be done either by industry or by the universities and which must be done by CSIRO for the good of the nation and as this research benefits the community directly and not any specific industry, the user-pays principle requires that this research should be directly supported by appropriation funding. These areas should have a prior claim on appropriation funds.

Following the line proposed by the Prime Minister, it is not automatic that other areas have to be fully funded by industry. Areas of research which are largely funded by levies would probably still be best handled within CSIRO for organisation simplicity and other areas which require the use of large national facilities again might best be placed in CSIRO, but many, if not all, of the remainder should only be done in CSIRO if they do receive very substantial and significant industry support.

F A (Lex) Blakey
Chief
Division of Building Research

Dear Editor,

In the present climate of increasing enlightenment concerning the preservation of our remaining rainforests, it does not seem to be a matter for self-congratulation (*CoResearch* No. 305, p.7) that yet another method has been developed for further exploitation of these rapidly diminishing forests.

To get this section of the timber industry into perspective, might I draw your attention to an editorial in *The Weekend Australian* (a paper not generally known for its radical opinions) of 26-27 Sept., p.14?

J P E Human
Kew

Dear Editor,

The advertisement for the six Institute Directors did not include the phrase 'CSIRO is an Equal Opportunity Employer' which is mandatory for all CSIRO job advertisements. This sort of cavalier disregard of CSIRO policy by headquarters when it comes to their own internal administrative procedures is something that we have come to expect. However, it is amazing that this sort of rule breaking should occur so soon after all the discussion of reform in CSIRO in the reorganisation. It seems we are back to headquarters' 'business as usual',

Now that CSIRO is supposedly established as an equal opportunity employer, the obvious conclusion to be drawn from this omission is that applications are not welcome from women and minority group members in this instance.

P J Powell
Marine Laboratories

The complete alternative

SIROCREDIT is the trading name of the CSIRO Co-operative Credit Society Ltd, a credit union dedicated to serving the needs of CSIRO staff throughout Australia.

It has evolved from the spirit of co-operation between people with a common bond working together. With the support CSIRO staff have provided in the 31 years of SIROCREDIT's existence, it has become a complete banking alternative for all staff.

The objective of SIROCREDIT is to increase the well-being of its members. To do this it must attract the savings support of all CSIRO staff, and to provide loans as required.

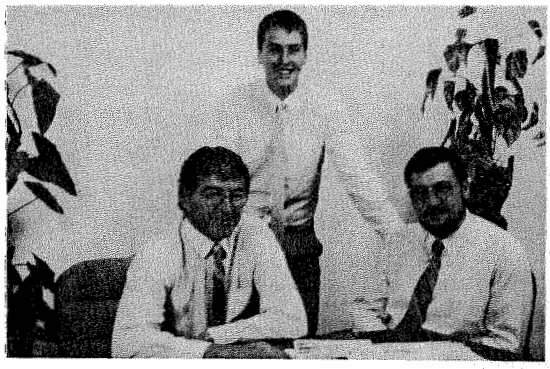
In today's competitive financial environment, though, it is not enough to simply rest on the high ideals of the credit union movement. SIROCREDIT stands at the top of the pile when it comes to providing returns to members.

Deposit rates are maintained at or above market rates and loans are provided at the lowest possible interest rates. More than this, though, SIROCREDIT provides many of its services on a no-cost basis (which includes the absorption of all government charges on accounts, on loan application fees, etc)

As a co-operative institution, SIROCREDIT's decisions and practices are based around the need to serve CSIRO staff.

If you haven't investigated the benefits available through SIROCREDIT, please read through this special feature and compare what SIROCREDIT can do for you with your current banking arrangements.

Our staff are happy to assist if you require further details.



The Melbourne office management team, from left, Keith Minney (finance and EDP manager), Andrew Hubbard (corporate service manager) and Eddie Sanfilippo (general manager).

Half yearly update — the news is good

The past six months have probably been the best on record for SIROCREDIT, with unprecedented demand for loans and substantial increases in deposits by both existing and new members.

Membership of the society has increased in excess of six per cent, with growth on deposits of 11.6 per cent and loans 5.5 per cent.

Liquidity is the highest it has been for many years and there probably hasn't been a better time than now to borrow. Interest rate reductions have occurred across all loan classifications, with some members paying housing loans enjoying rate reductions of more than two per cent.

Unlike many financial institutions, SIROCREDIT has been able to reduce loan rates on both its existing portfolio and new lending.

While loan rate reductions have occurred with other institutions, to date they have only applied to new lending. Existing borrowers in some instances are still paying the higher rates.

All SIROCREDIT members with existing loans have benefited from the reductions.

Our depositing members, who invariably support the society with their Whole of Pay, have seen their yields in some instances reduce by up to three per cent due to market forces. Nevertheless, even though rates dropped significantly in the first half of the fiscal year, there is no question that SIROCREDIT has paid, in most instances, higher rates than those paid by building societies and banks.

The difference in the rates has been as high as two per cent for long term deposits. The Ultimate call account continues to outperform the market with its flexibility and high returns. The cash management accounts have, for the past four months, paid up to one half per cent above the market. Significant growth has obviously occurred in this category of deposits.

Irrespective of the significant changes in money market rates, SIROCREDIT continued to return to members in excess of 70 cents in every revenue dollar.

No extra charges

Most people are probably aware of the growing trend by financial institutions to charge for the use of services by their customers.

Few, if any, of us have not seen the regular debits on our bank statements listing 'service charge', 'government fee' or 'misc charge'.

Recent announcements by major banks also have implied that the levy of such charges is 'inevitable' and can only expand in the future (to include the changing of conditions of previously 'cost free' accounts).

Coupled with this, of course, are the hidden costs which are spelt out only in the fine print of account conditions, such as the minimum balance required, or maximum number of transactions.

At SIROCREDIT, all the costs of members' normal banking operations are absorbed, including government fees and charges.

Copy for this feature has been provided by SIROCREDIT as a service to CSIRO members wanting to know more about the Organisation's credit union. Responsibility for the information in the feature is taken by SIROCREDIT.

Membership for life

Credit Union members are people who possess something which brings them together — a common bond. SIROCREDIT members are linked by their association with CSIRO.

Whether you are directly employed by CSIRO, or are involved in one of the many collaborative or joint projects, you are eligible to join. The link also extends to immediate family members.

To become a member, you purchase five $2 shares, which are refundable should you choose to leave the credit union.

Once you have become a member, you may maintain this relationship for life — once a member always a member — regardless of whether you choose to change occupations, retire or whatever.

SIROCREDIT has developed its services on an Australia-wide basis to ensure that no matter where you are all the benefits are available to you.

Membership applications are available from SIROCREDIT display boards, divisional representatives (see listing in this feature) or direct from SIROCREDIT offices.

SIROCREDIT ADDRESSES

MELBOURNE (Head office)

2nd Floor,
9 Queens Road,
MELB VIC 3004

Freepost 341,
PO Box 6530,
St Kilda Central PO,
VICTORIA 3004

PH: 03-267 5377
Toll free: 008-33 8698
FAX: 03-267 7405
Bus. hrs: 8.00am-4.30pm

CANBERRA

Building 302,
CSIRO Black Mountain Labs,
Clunies Ross Street,
CANBERRA ACT 2601

GPO Box 710,
CANBERRA ACT 2601

PH: 062-46 5400
062-46 5785
FAX:062-46 5440
Bus. hrs: 8.30pm-4.30pm

SIROCREDIT keeps striving as growth continues

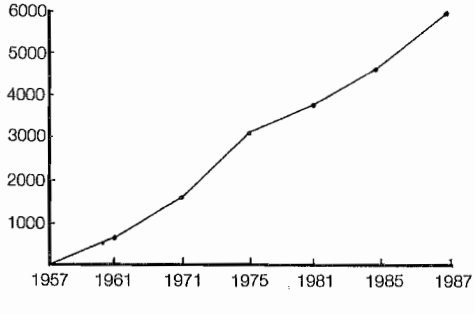
SIROCREDIT began in 1957, when it was recognised that there was a need for CSIRO staff to have their own financial support group devoted to the individual needs of the Organisation.

From these humble beginnings, a large, efficient credit union has evolved. Far from losing the personal touch and direct contact with CSIRO, SIROCREDIT has remained one of the most effective financial institutions in Australia.

Size has brought with it innumerable advantages, not the least of which is security. By taking advantage of economies of scale, SIROCREDIT has been able to offer a range of benefits and referral services to members.

The slogan for 1987/88 says it all: 'Striving to Remain the Best'.

MEMBERSHIP GROWTH



Negative gearing

Take advantage of eased conditions

Before the September 1987 Federal Budget, deductions for interest on loans used to acquire rental properties after 17 July 1985 were, in general, restricted to the rental income less other expenses.

Excess interest was quarantined and carried forward and deducted from future net rental income from the property, or used to reduce any taxable capital gains on the subsequent sale of that property.

From 1 July 1987, limitations on the deductibility of interest on money borrowed to acquire rental properties were removed.

Any excess interest that had been quarantined before 30 June 1987, under the present legislation, will be allowed as a deduction in the 1987/88 tax year. This effectively represents a retrospective relaxation of the negative gearing restrictions and re-introduction of a tax shelter.

At the 1987 Budget, the Government announced that the full interest cost of owning and maintaining rental properties would be deductible against income from any source (including PAYE) regardless of when the property was acquired or when the loan was entered into.

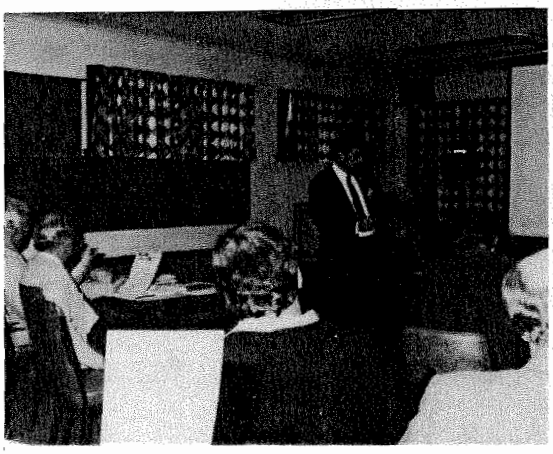
The surprising aspect of this announcement was that any negatively geared interest previously not allowed as a deduction would now qualify for a deduction in the year of income ending June 1988.

SIROCREDIT, with its $43 million base, is adequately placed to serve members' needs in this area. All CSIRO employees can take advantage of the benefit of negative gearing, using SIROCREDIT as the source of funding for their investments.

The Government's reintroduction of negative gearing has provided an option that should be considered particularly by members in the higher tax bracket or with recent lump sum superannuation payouts.

There has never been a better time to minimise your tax exposure.

A SIROCREDIT loan can assist by providing a loan package as flexible as needed in order to meet the conditions and terms, and at the same time meet the individual borrower's cash flow requirements.



General manager Mr Eddie Sanfilippo covering some details of the SIROCREDIT service to a group of members.

SIROCREDIT, in conjunction with CIC Insurance, is offering an insurance package called Valu Pak, designed specifically for SIROCREDIT members.

Valu Pak, relaunched with additional benefits in August this year, offers many advantages over other insurance policies, not least of which is the pay by the month option at no extra charge.

Valu Pak covers all domestic needs, and the policy can, if desired, include your car, home and boat as needed, so you end up with one convenient policy to cover the lot. Payments are automatically taken from your salary.

Ring, or send your renewal notice to, SIROCREDIT for a competitive quote.

Cash management accounts

With a SIROCREDIT cash management account you can earn high interest without the inconvenience of locking your money up for long, inflexible periods of time.

Cash management accounts are available to investors from $500 deposit and are structured to ensure the more funds invested the higher the return.

Deposits may be made by cheque or payroll deduction and withdrawals by either cheque or transfer to SIROCREDIT account (after the required notice of withdrawal).

Interest rates are reviewed on Thursday each week in line with official money market trends.

Interest is paid twice yearly on the last day of March and September directly into the account.

ACCOUNTS AVAILABLE:

30 days' notice of withdrawal:	
Minimum balance	$500
Minimum deposit	N/A
Minimum withdrawal	N/A
Notice of withdrawal	30 days
Seven days' notice of withdrawal:	
Minimum balance	$5000
Minimum deposit	N/A
Minimum withdrawal	$1000
Notice of withdrawal	7 days

Security

At SIROCREDIT, the safety of members' deposits is paramount.

Apart from the inherent stability guaranteed by its membership bond, SIROCREDIT is subject to legal and statutory regulations. These include:

* State legislation covering all aspects of credit union organisation and operation (Co-Operation Act 1981)
* Credit Co-Operatives Reserve Fund — a statutory authority set up specifically to guarantee your deposit
* Monthly reporting to such bodies as the Commissioner of Corporate Affairs, the Registrar of Co-Operatives and the Reserve Bank
* Independent auditing from a member appointed accountancy firm
* Bond insurance to guard against misappropriation of funds by directors and/or staff.

Confidentiality between the member and SIROCREDIT is of great importance. No information relating to the member's financial status is ever given to another party. So when calling the office, don't be disheartened if SIROCREDIT staff need to satisfy themselves with appropriate questions before releasing the information sought.

Ultimate account gives ultimate convenience

SIROCREDIT Ultimate S1 combines all the features you need to conduct your day to day finances. The account is free of any charges (including government levies), and earns a top rate of interest.

Your account may be 'fed' any way you choose, but obviously direct crediting of your salary or superannuation, plus payments such as family allowance, adds to the convenience.

There's the choice of:

***Personal cheque and deposit book**

. free of any costs

. optional encashment facility to enable you to cash a cheque at any National Australia Bank around Australia

. deposits can be made over the counter at any branch of the National Australia Bank

***Visa Classic card**

. free of any costs

. access to your account through purchases at over 5.5 million merchants worldwide

. access to cash from your account at any Visa issuing financial institutions worldwide

. cash at the touch of a button through the NAB Flexiteller network, the credit union's own Rediteller network and over 18 000 automatic tellers around the world displaying the Visa decal

***Periodical payments**

. free of any costs

. automatic payment of any regular commitment such as rental or mortgage expenses

. fortnightly electronic funds transfer (EFT) to any bank account in Australia of your choice, guaranteed to credit the account on pay day

***Bill paying facility**

. free of any charges, including postage for one-off payments to any third party.

Ultimate account holders receive a detailed monthly statement of all transactions against their account, which is supplied with a complete rundown on the interest rates paid and charged by SIROCREDIT on the reverse. Additional statements may be provided at the your request and, of course, free of charge.

Included is a handy and durable PVC statement folder which provides and maintains ready access to all financial dealings (this is especially useful around tax time), plus a convenient cheque and deposit book wallet.

Optional overdraft facilities may be linked to ensure immediate access to a line of credit in case of emergencies or special purchases.

Large range of services

SIROCREDIT's range of services aims to ensure that members can benefit from their credit union throughout their working and retirement lives.

Current services include:

*** A completely cost free consumer banking package providing access by both traditional means (personal cheques, bill paying counter service) and electronic mediums, such as Classic Visa card;**

*** Cash management and investment opportunities for the large and small depositor, equal to or better than that available elsewhere;**

*** Loans for any worthwhile purpose — eg. for the purchase of a house, car or an investment block of flats. Advantages include cost-free terms, life insurance cover and no establishment or set-up fees;**

*** Travellers cheques issued commission free;**

*** Discounted domestic, commercial, vehicle and rural insurances;**

*** Investment counselling from independent professionally licensed advisors;**

*** Legal advice and service;**

*** EDVEST — a retirement package offering premium investments and a range of lifestyle bonuses;**

*** Travel rebates and discounts through referral agents; and**

*** The Christmas Club**

Loans made easy

At SIROCREDIT, we believe loans for worthwhile purposes should be available as easily as possible.

We undertake to provide members with loans on the best possible terms and assess each application on its merits.

PERSONAL LOANS:

Purpose: If you need money for a car, boat, travel, home improvements or furnishings, or any other worthwhile purpose, we can help. Anything from $500.

Limits: Up to $450 000 may be approved.

Security: A range of securities may be held for personal loans, including guarantees, mortgages, Bills of Sale and loan contracts.

Term: The maximum term of a personal loan is 25 years, but for smaller amounts a minimum payment of $50 per fortnight is applied.

Interest rate: Calculated on a monthly reducing basis and subject to fluctuation in line with market trends.

HOME LOANS:

Purpose: To assist in the purchase of an owner occupied home or home unit; to purchase land on which a home is to be constructed; or to assist with the construction of a home.

Security: A registered first mortgage or equivalent charge over the property.

Limits: Normal maximum of $150 000.

Term: Maximum term of 25 years.

Interest rate: Calculated on a monthly reducing basis and subject to fluctuation in line with market trends.

INDUSTRIAL LOANS:

Purpose: To assist with the purchase of income producing assets, such as rental properties, share/equity investments, commercial businesses.

Limits: Up to SIROCREDIT maximum of $450 000.

Security: Variable, depending on nature of investment. A mortgage or charge over assets purchased is the most common security.

Term: Maximum term 25 years.

Interest rate: Calculated on monthly reducing basis and available on negotiable terms, i.e. fixed or fluctuating rates. Interest only option available on loans with terms up to five years, renewable at SIROCREDIT's discretion.

BRIDGING LOANS:

Purpose: To assist with short term finance required in the period before the sale of assets, such as house purchases prior to the sale of existing residence.

Limits: Up to $450 000.

Security: Registered mortgage or equivalent.

Term: Maximum term 12 months.

Interest rate: Fluctuating or fixed rate available with interest only option.

OVERDRAFT:

Purpose: To provide a 'safety net' in cases when you need immediate access to a line of credit for emergencies, or that purchase that 'can't be passed up'.

Limits: Up to $5000.

Security: Normally a loan contract is held as security for overdrafts; however each application is judged on its merits.

Interest rate: Calculated on a daily balance from the date the overdraft amount is drawn.

GENERAL CONDITIONS:

Eligibility: Any full shareholding member of the Society is eligible to apply for a loan. Qualifying conditions may apply to home loans, depending on the availability of funds (SIROCREDIT can provide a guarantee of approval, should you require it, before looking for a house).

Repayments: Where possible, all loan repayments are collected by fortnightly or monthly payroll deduction.

Income guidelines: As a general rule, fortnightly commitments should not exceed 30 per cent of gross joint income. Applications are, as always, considered on their merits.

THE SIROCREDIT ADVANTAGE

No application or establishment charges. The only cost is that incurred in preparing and registering security held for loans.

Prompt approval — normally within 24 hours.

Free loan protection insurance against death of both family income earners.

Competitive insurance cover with Pay by the Month cover (at no extra charge) option.

Optional and competitive loan repayment insurance.

SIROCREDIT's fixed term investments offer several attractions to both the small and large investor:

*The minimum deposit is $1000 ($5000 for Cheque a Month accounts) and the interest rate is fixed for the term of the deposit you select.

*Interest is paid either on maturity or on a six monthly cycle from the date of deposit. For Cheque a Month depositors, interest is paid monthly from the date of deposit as per your instructions.

*Automatic money management, whereby you are advised of an impending deposit's maturity and requested to provide instructions. However, you may choose to ignore issuing further instructions and have your investment rolled over automatically (with interest compounded, if required).

*Flexible term tailored to your needs and still providing the security of a guaranteed interest rate from three to 24 months.

*Security certificate issued for each investment placed detailing complete details of your deposits.

If you have funds which you don't need at call, contact any of our staff for further information. Interest rates for deposits of over $50 000 are available from SIROCREDIT offices.

Around Australia

SIROCREDIT's divisional reps

With so many CSIRO sites, SIROCREDIT has a large task in ensuring member service and communication is maintained around Australia.

This is made considerably easier with the help of divisional representatives, local staff volunteers who take the time to keep up with SIROCREDIT information and documentation, and keep us informed of local issues.

The local reps devote their own time to ensuring that forms are on site for all members, answering basic queries and assisting with SIROCREDIT presentations. We are very proud of our reps, and to ensure they are continually up to date, several new lines of communication have been established.

These include the provision of a complete guide to SIROCREDIT, with monthly updates, plus regular training sessions which have already been conducted in Victoria and the ACT and will, over the next few months, be held around the country.

Your local rep will be happy to direct any queries to the appropriate SIROCREDIT staff member, or provide you with all the correct applications and brochures.

Current SIROCREDIT reps are:

Philip Platon,
Division of Animal Health,
(03) 347 2311
Janine Pickering,
Division of Applied Organic Chemistry,
(03) 647 7222
David Slater,
Division of Atmospheric Research,
(03) 586 7666
Helen Kenna,
Division of Building Research,
(03) 556 2211
Robert Lindsay,
Darwin Laboratories,
(089) 22 1711
Kate Dowling,
Division of Energy Technology,
(03) 556 2211
Norm White,
Division of Entomology,
(062) 46 4911
Joy Horwood,
Division of Food Research,
(03) 556 2211
John Barrie,
AAHL,
(052) 26 5222
John Glover,
Division of Applied Organic Chemistry,
(03) 647 7222
Geoff Stomann,
BIPC - MELB.
(03) 418 7333
Bernie Hawkins,
Division of Building Research,
(03) 556 2211
Graeme Black,
Division of Chemical & Wood Technology,
(03) 542 2244
Neil Hamilton,
Division of Energy Technology,
(03) 556 2211
Stuart Henderson,
Division of Environmental Mechanics,
(062) 46 4911
John Hall,
Division of Forest Research (SA),
(087) 25 5555
Dallas Richmond,
AAHL,
(052) 26 5222
Peter Chapman,
Division of Animal Production,
(02) 631 8022
Dean Daniel,
Black Mountain Site,
(062) 46 4911
Ray McInnes,
Division of Entomology,
(062) 46 4911
Max Lilley,
Division of Food Research (QLD),
(07) 299 3122
Graeme Sinclair,
Division of Forest Research,
(062) 81 8211
Anne Brown,
Division of Human Nutrition,
(08) 224 1800
Pauline Macca,
Division of Manufacturing Technology,
(03) 487 9211
Lyn Chaplin,
Marine Laboratories (WA),
(09) 246 8288
Simon Waters,
Division of Mineral Chemistry,
(03) 647 0211
Bob Draper,
North Ryde Labs,
(02) 887 8666
Lindsay Adler,
Division of Plant Industry,
(062) 46 4911
Margaret Davis,
Division of Protein Chemistry,
(03) 342 4200
Peter Nairn,
RAO — ACT,
(062) 81 8444
Gil Morgan,
Division of Soils (ACT),
(062) 46 4911
Ron Hynes,
Division of Horticultural Research,
(050) 25 6201
Kenneth Parker,
Division of Information Technology,
(03) 347 8644
Tim O'Sullivan,
Marine Laboratories (TAS),
(002) 20 6222
Phillip Tyler,
Division of Mineral Engineering,
(03) 541 1222
Paul Brown,
Division of Plant Industry,
(062) 46 4911
Geoff Taylor,
Division of Plant Industry,
(062) 30 2229
Ross Clarke,
RAO — WA,
(09) 322 2111
Tony Lynch,
RAO — VIC,
(03) 268 7111
Janet Clarke,
Division of Soils (SA),
(08) 274 9311
Margaret Raffe,
Division of Human Nutrition,
(08) 298 5800
Craig Cameron,
Division of Manufacturing Technology,
(08) 268 0111
Eddie Johnson,
Marine Laboratories (QLD),
(07) 286 2022
Angela Johnstone,
Division of Maths & Stats,
(062) 81 8555
Brad Rilatt,
Division of Molecular Biology,
(02) 886 4888
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Paul Batson,
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Terry Williams,
Division of Radiophysics (Parkes),
(068) 62 3677
Martin Gilby,
Tas. Regional Lab (Stowell),
(002) 20 1444
Cathy Griffin,
Division of Tropical Crops & Pastures,
(07) 377 0711
Marcus Karilaid,
Division of Water Resources Research,
(062) 46 4911
Peter Joss,
Division of Wildlife & Rangelands (Deniliquin),
(058) 81 1133
Albert Williams,
Division of Wildlife & Rangelands (ACT),
(062) 42 1600
Janice Lindsay,
Division of Water Resources Research,
(062) 46 4911
Yvonne Stewart,
Division of Wildlife & Rangelands (Atherton),
(070) 91 1755
Alan Woodbridge,
Division of Tropical Crops & Pastures,
(077) 71 9511
Ken Parker,
Division of Wildlife & Rangelands (Alice Springs),
(089) 52 4255
Damien Smith,
Division of Wildlife & Rangelands (WA)
(09) 252 0111
John Burdett,
CIRC,
(062) 48 4491

Historical scientific papers sought in bicentenary project

CSIRO scientists are being urged to take part in a survey of science records conducted by the Australian Bicentennial Historic Records Search in conjunction with the Australian Science Archives Project (ASAP).

The search, which is an initiative of the Australian Bicentennial Authority, aims to locate collections of historically significant paper-based records held in private ownership and list them on the historic records register. The search is also an initiative of the Department of History and Philosophy of Science at the University of Melbourne which promotes the archival preservation of the papers of Australian scientists.

In a joint letter sent to chiefs, the search's project officer, Dr Marion Amies, and the ASAP's archivist, Mr Gavan McCarthy, said Australian science records were poorly represented in archives and libraries.

'The burgeoning study of the history of Australian science has revealed many shortcomings in the documentary record as presently preserved in archival repositories and libraries,' they said.

'Many of the records crucial to our understanding of Australian science are contained in the personal papers of scientists themselves and in the records of the scientific societies and research organisations which have played pivotal roles in its development.'

Dr Amies said the records would simply be listed on the register or, if the owner wished, be transferred to an appropriate library or archive.

'This joint venture between the search and ASAP provides a unique opportunity to increase awareness of the historical significance of Australian scientific records,' she said.

'It will provide a more accurate indication of their extent, nature and scope and in due course will enable historians to gain enhanced perceptions of the history of Australian science.'

CSIRO's archivist, Mr Colin Smith, said he regarded the search as a helpful exercise that did not conflict with existing archival arrangements.

Mr Smith would welcome copies of information given to the search. He can be contacted on (062) 48 4677.

For further information contact the Australian Bicentennial Historic Records Search, National Library of Australia, Canberra ACT 2600 or telephone (062) 62 1271.

Photo: The Canberra Times

Rosalie Wark, 10, left, and her sister Katherine, 11, of Macgregor, ACT, inspect a stuffed Congo dwarf crocodile at the Division of Wildlife and Rangelands Research. The crocodile is part of the Australian National Wildlife Collection at the Division. Twelve members of the Double Helix Science Club were treated to a tour of the collection in August.

CSIRO Benevolent Funds 'The quiet achievers'

The CSIRO Benevolent Funds feel the term 'The Quiet Achievers' is appropriate to describe the nature and confidentiality of their work.

The Benevolent Fund is a national in-house facility which aims to assist all CSIRO staff and ex-staff when in need, the assistance being mainly as direct and immediate financial aid.

The concept originated in the early 1940s at the Division of Radiophysics in Sydney, gradually spreading to other divisions within New South Wales. It is now well established throughout Australia, reaching all CSIRO staff.

Within the overall fund there are four separate and independent groups known as the Queensland, NSW, ACT and Southern Funds, with the Queensland group also serving CSIRO staff based in the Northern Territory, and the Southern Fund, sited in Victoria, providing assistance for staff in Western Australia, South Australia and Tasmania as well.

Although the functioning and policies of the four funds may vary, they have a common role as sympathetic and concerned providers of directed financial aid to those in need.

In general, the funds operate through a local representative or site committee elected by local contributors. This enables an immediate provision of financial aid to local staff with further decisions, where appropriate, being made by a general, management or executive committee of the particular fund.

Assistance is given by all funds in the form of grants or interest-free loans, the one exception being the Southern Fund which generally provides financial support by means of grants only.

Through their experience in finance related situations, the funds have been able to advise headquarters of problems in certain areas of personnel administration, such as the level of retirement seminars, assistance for visiting scientists and adjustments to next-of-kin records.

Gestures of sympathy, cards and gifts to staff hospitalised or on extended sick leave are also part of the funds' operations. Christmas cards, with the appropriate insert, are sent to retired staff, or the surviving partner, as a reminder of the funds' existence and willingness to assist should the need arise.

Some general examples where assistance has been given include:

*in the event of sudden or unplanned-for expenses such as health costs;

*financial strain on day-to-day expenses due to long term illness or LWOP;

*financial needs in the event of a family crisis such as a bereavement or marriage breakdown.

All cases are looked at individually and assistance based on the merits of each. However it is emphasised that the funds look on all situations with sympathy and concern.

Contributions are the main

Cont. on p.8

Colour consistency control for newsprint mill

The Division of Applied Physics is collaborating with Australia's only supplier of newsprint, Australian Newsprint Mills Ltd (ANM), on an instrument to enhance the consistency of colour in paper production.

The instrument, a 'tracking colorimeter', is a small box mounted on the paper machine which measures the colour of paper as it is being made, allowing feedback control of dye addition to the pulp. It represents an improvement in a technology pioneered in newsprint manufacture by ANM several years ago, which produces paper of very constant colour. Today's newspapers, which often include colour printing, increasingly demand that variations in the shade of the paper be unnoticeable from one shipment to the next.

ANM supplies about two thirds of the newsprint used in Australia, and is owned by a consortium of newspapers.

The project team at Applied Physics, led by Dr Jim Gardner, hopes to install the prototype tracking colorimeter at the ANM plant in Tasmania next month. Finetuning of the software will then take place.

*Another collaboration between CSIRO and ANM came to fruition recently with the installation of a sophisticated image analysis system designed and assembled by the Division of Textile Physics.

The system, put together by Mr Graham Higgerson at DTP, consists of a modified personal computer connected to a small video camera. When a small sample of pulp is viewed through the microscope, the image appears on one of the screens and may be interpreted by the computer.

Specially written software counts the number of fibres and measures the shape of each. This information is useful in explaining the properties of paper made from that pulp.

Letters

Cont. from p.2

Dear Editor,

Research programs arranged between large private enterprise bureaucracies and CSIRO are often spectacular and administratively satisfying but leave central problems — budgets and getting Australian industry (the major and most innovative portion of which is small business) up to speed scientificially, largely untouched.

CSIRO's biggest asset remains its personnel — it has some thousands of highly skilled and scientifically literate people distributed at dozens of sites throughout the country. Why cannot these people be enlisted as representatives of CSIRO (i.e. the whole of CSIRO) and the universities? Equipped with a copy of the *Directory of CSIRO Research Programs*, there would be few people who could not assist business by pointing to relevant expertise — all of them now have links with business, as private individuals. At the moment a surprising number of CSIRO people are unaware of the extent of the expertise in CSIRO and of the existence of the *Directory*.

There are some obvious administrative hazards with this proposal but given some appropriate ground rules, none of them should be insoluble. This course would lead to a perception that scientific research is an enormously cost effective and worthwhile community undertaking, to a wider social support base and very likely to a more favourable budget climate.

We would have to live with the fact that it might also lead to a reduction in one of the few growth (and very costly) areas of science over the past 10 or so years — reviewing and reorganising CSIRO.

Gavin Byrne
Research Fellow
Division of Forest Research

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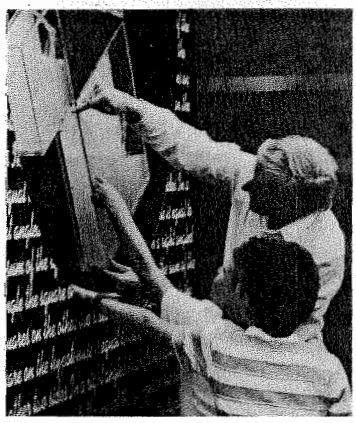
Jazz at the Show



More than four decades on and the Sirocats jazz band is still going strong. They recently enhanced CSIRO's presence at the Royal Melbourne show. Above, left to right: Lynette Patton, John Moresby (an original band member), Jim Mills, Shane Youl, David Patton, Peter Law (founder of Sirocats), Fred Sommervelle, Cliff Restarick and Rod Neil. **Pictured right,** *a couple of youngsters come to grips with Pythagoras' theorum at the Fun with Science display at the show (photo: Malcolm Paterson).*

Glass clad buildings

DBR seeks industry partners for major project

The Division of Building Research is seeking industry support to investigate appropriate design and construction techniques to ensure the viability of medium- and high-rise glass clad buildings.

DBR is negotiating to establish a four year project in co-operation with a number of outside bodies. The cost of the project is likely to exceed a third of a million dollars a year.

In recent years there has been a boom in glass cladding, which gives buildings a rather dramatic appearance. The television show *Dallas* may have given impetus to this through its spectacular opening credits.

DBR scientist and chairman of the glass committee of the Standards Association of Australia, Dr Charles Gerrard, said potential problems are associated with the relatively recent innovation of structural glazing. Structural glazing is an industry specific term referring to the use of adhesive to stick glass onto frames.

A recent DBR survey into the perceived needs of industry for research into curtain wall design for buildings indicated a variety of problems. The term 'curtain wall' refers to external walls of buildings which are 'hung' on the outside of the structure and do not themselves bear the weight of the structure, unlike traditional brick and stone buildings. The strength and long term durability of structural silicone glazing systems used in glass cladding were shown to be of particular concern in the survey.

Under ideal conditions, this strength has been shown to be more than adequate, and there did not appear to be any recorded failures of structural glazing. However, in practice there were some uncertainties, concerning firstly the possibility of degradation with time and secondly faults introduced through human error.

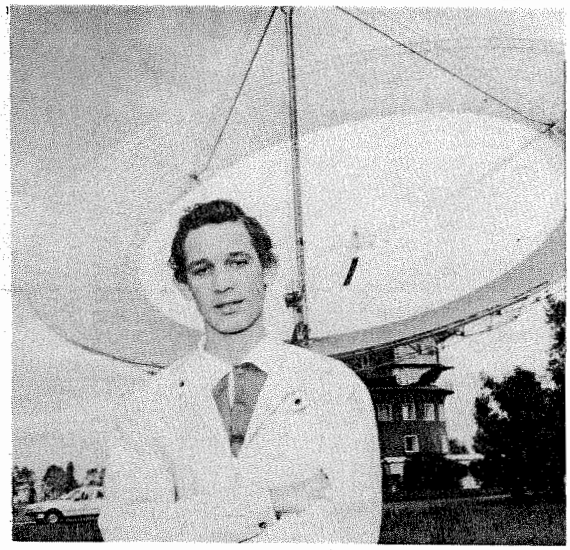
While some companies in the glazing industry were already undertaking routine tests to pinpoint where such human errors occur, this practice was not universal. The testing by these more responsible companies occasionally led to the rejection of some glazing units. 'One is left with an uncomfortable feeling in the knowledge that such tests are not performed on an industry-wide basis,' said Dr Gerrard.

The research program would have three sub-programs: adhesion of sealant interfaces and cohesion of sealant; design of curtain walls and glazing systems for strength and deflection; and performance of curtain walls.

Companies being approached to participate in the project fall into five categories: glass manufacturers, sealant manufacturers, glazing framers, consultant architects and engineers and building owners and managers.

As DBR is at the centre of standard-setting for the building and construction industry, its work on this project is likely to be of great importance for the future use of glass cladding in Australia.

CSIRO pioneered building facade work in Australia, with the test rig SIROWET which, among other projects, was used to prevent 'leaks' at new Parliament House.



Grafton High School student Carl Desborough recently spent a week working at the Parkes radio telescope as part of his work experience program. He was supervised by astronomer Dr Rick Forster, and worked with Dr Forster, Dr Frank Gardner and Dr John Whiteoak on a continuing project to survey ammonia emission lines in the Southern Milky Way. Carl said his brief experience with the work of the Division of Radiophysics sparked an interest in furthering his involvement in the field.

Consulting venture

Cont. from p. 1

It is currently unclear how the proposed venture would operate in relation to CIRC.

One stumbling block in setting up the consortium could be the initial financial commitment from the divisions. Already they are stretched to the limit, especially the environmental divisions, many of which have to exist almost solely on dwindling appropriation funds.

It's likely the venture would build over the first year or two to a cost of $300 000 to $500-000 per year, but by that stage it's hoped money will be starting to come in to alleviate costs. The aim is to keep overheads, and the divisional financial commitment, to a minimum.

Some chiefs pointed out it could reduce the flexibility available to them now to negotiate consulting work on their own terms, but conceded this could be traded off against other gains and advantages.

Dr Paltridge said he was not 'starry eyed' about the Organisation making huge amounts of money through the venture. He believed it would handle business of no more than a couple of million dollars a year once it's up and running, but this was in the light of the fact that most divisions envisaged no more that 2-3 people per division being involved in the work at any given time.

'There is more to be gained than pure profit,' he said. 'Even if it only covers costs, it will allow for continued employment of people divisions want to keep, will give good experience for research scientists and, let's face it, would be very good fun.'

The proposal will be presented to the 17 November Management Committee meeting.

PAC seminars take CSIRO to opinion leaders

The Public Affairs Committee (PAC), formed earlier this year to develop further the concept of 'issue management' within CSIRO, has begun a series of seminars designed to inform opinion leaders in the wider community of the Organisation's activities and importance.

The community leaders program is one of a range of tasks set for PAC. Already a briefing for key senior Federal bureaucrats and ministerial advisors has been held, and on the 30th of this month a forum will be held in Sydney in conjunction with the Committee for the Economic Development of Australia (CEDA) for senior executives in the financial community.

Among those who attended the forum for government officials were: Mr Fred Argy, director of the Economic Planning Advisory Council; Dr Michael Keating, secretary of the Department of Finance; Dr Robert Webb, general manager export development for Austrade; and Mr Bernie Fraser, secretary of the Treasury.

BIPC Director Mr Peter Dunstan said the response had been 'excellent', and had showed that the approach taken by PAC was correct.

This month's CSIRO/CEDA forum will be addressed by CSIRO Board member Mr David Hoare (chairman of Bankers Trust Australia), Dr Alessandra Pucci (managing director of Monoclonal Ltd) and CSIRO Chief Executive Dr Keith Boardman. The theme is 'Australia: An Innovative Future?'.

In the process of being finalised are joint seminars with the Institute of Directors and the Confederation of Australian Industry.

Mr Dunstan said it was essential to have a structured approach to the corporate communication program because of the need to effectively boost awareness of the importance of CSIRO for the economic and social welfare of Australia, and to appeal to those groups which made the key decisions affecting Australia's future.

'We need to participate in and adapt to the social and economic environment,' said Mr Dunstan.

It's planned that an institute director and division chief will join the committee in the near future, and other institute and divisional representatives take part in deliberations when issues relevant to them are being considered. Mr Dunstan is also hopeful the PAC will encourage and assist divisions to formulate their own issue management programs specific to their areas of interest.

The formation of the committee follows the establishment of a Public Affairs Unit within the Bureau of Information and Public Communication (see *CoResearch* 301, April '87).

Obituaries

With the death of Ian Brown, formerly of the Division of Applied Organic Chemistry, on 31 August, Australian chemistry lost one of its great characters.

Ian was born in Adelaide on 28 May 1917 and attended St Peters College, Adelaide from 1926 to 1935. In his final year at school he won prizes in chemistry, physics and mathematics.

In 1936 he started a science course at the University of Adelaide, but had to discontinue his studies in that year because of injuries to his leg and later his hands. He re-commenced in 1937 and was awarded a Second Class Honours Degree in Organic Chemistry in 1940.

In January 1941 he was employed as an assistant chemist in the Birkenhead laboratory of the Shell Company but resigned in July of that year to take a similar position with Beckers Pty Ltd, where he helped with the design and development of the Caffeine plant.

He resigned from this company in March 1942, for personal reasons. From documents accompanying his later application to the position of assistant research officer at CSIR, the personal reasons were connected with a perceived lack of safety precautions at the Beckers' plant.

Ian commenced at CSIR on 20 July 1942, assisting D R Zeidler on the furfural project in the chemical engineering section. In 1947, he commenced a project on 'the distillation of organic liquids' and it was in areas related to this that he worked for the rest of his career.

Ian's high standards with regard to the measurement of the physical properties of very pure compounds was recognised worldwide. In 1963 he was invited to write a chapter on nonelectrolytes for volume 16 of the *Annual Review of Physical Chemistry* and this was published in 1965.

In 1965 he accepted an invitation to become a Titular Member (the highest grade) of the IUPAC Commission on Data and Standards and served on this Commission with distinction for the maximum allowable period of eight years. In 1966 he was awarded a DSc by the University of Adelaide.

Ian's work was characterised by an extraordinary patience and persistence. This was exemplified by his work on the design of the Division of Applied Organic Chemistry building at Clayton.

He was one of the first people to try to calculate the flow of air required in a laboratory to ensure a safe environment. Twenty years and several designs later, the final building is nearing completion. It is a pity that Ian did not live to see the finish of this project.

Ian is survived by his wife Gwen, son Richard and daughter Kris.

Tom Spurling.

Paul Rayner of the Division of Radiophysics was tragically killed in a car accident on 13 September. He was 40 years old. Paul is survived by his wife, Pat, and their two young children, Christopher and Emma.

At the time of his death, Paul was the systems manager for the Division's computing network. In addition, he took a significant role in software design work for the Australia Telescope and in the selection of its computer hardware. He was well known within CSIRO and the local computer industry. Paul was active in both technical and administrative aspects of the Digital Equipment Computer Users Society.

Paul joined the Division in 1975 to work in the computer group and was heavily involved in software development programs for both the Parkes 64m and Epping 4m radio telescopes. His contribution to these areas earned him considerable respect throughout the world astronomical community.

In the early 1980s Paul spent 18 months with the University of Bonn in West Germany, working on astronomical image processing software. In 1983 he became leader of the Radiophysics computing group and took on formal responsibility for the day to day management of the Epping computer system.

Paul earned the respect of all who knew him, both within the scientific community and the computer industry, for his technical ability, hard work, cheerful outlook and constant willingness to help others. He will be sorely missed by his colleagues at Radiophysics, both professionally and as a dearly valued friend.

Dr Steffen was placated for the enforced but temporary halt to his running activities by having a running shoe drawn on his plaster cast (see story, right).

Labs provide 'old fashioned' location for movie scenes

The next film from the company which made the award winning movie *Malcolm* has been partly filmed at the 'old fashioned' laboratories used by the Division of Mineral Chemistry at Port Melbourne.

The film, a comedy called *Rikky and Pete*, is about a geologist, Rikky Menzies, and her brother Pete who fancies himself as an inventor.

The Division turned out to have just the sort of antiquated labs required by the film company, Cascade Films, for the early scenes (see photo, right).

The film, which will probably be released mid next year, follows the pair to Mt Isa, where they eventually set up their own mine.

Graphic artists' group

CSIRO Graphic artist John Best believes there is a need for an informal association of artists within the Organisation.

'Photography and drafting professionals have long benefited from having such groups,' said John. 'Ideas and information on design techniques, equipment, materials and suppliers might be exchanged via a newsletter, and perhaps annual national meetings could be arranged.'

He wants to know if there is sufficient support for the proposal: who is interested, what they do and where they are. Please contact:

John Best
Graphic Designer
CSIRO Editorial and Publishing Unit,
314 Albert Street
East Melbourne Vic 3002
Ph: (03) 418 7332.

Mr Ian Henderson, principal research scientist at the Division of Manufacturing Technology (Adelaide), has received the 1987 Florence Taylor Award of the Australian Welding Institute. This is the premier award of that Institute, and is awarded for, among other things, outstanding contributions to the advancement of the science and art of welding. Previous recipients have included Sir William Hudson and Professors John Roderick and Hugh Muir.

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Indestructible Will

Dr Will Steffen at the Division of Environmental Mechanics recently burst into print in the magazine *Wild* in his other guise as an adventurer who loves climbing and trekking.

In the blurb introducing Will to readers, the magazine said:

'...In climbing circles Will is known for his prehistoric nervous system; he once climbed and walked for three weeks on a broken ankle before the message from his foot arrived at his brain...'

In fact, it was only when he started training for the Nike marathon back in Canberra that he realised there was something wrong with his foot, three weeks after the fall which caused the injury in New Zealand. There was much head shaking among doctors at Royal Canberra Hospital once the X-rays were taken.

Perhaps the Division could get outside funding for a research project into Will's remarkable constitution.

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Neil Manning at an old press for making moulds.

Cliff Toussaint, the popular deputy regional personnel officer at the Brisbane regional office, has ceased duty with the Organisation after 30 years service. During his time with CSIRO, Cliff worked at Headquarters, the Division of Forest Products and Division of Meteorological Physics before his move to Brisbane in 1966 to assist in setting up the RAO. Cliff was the last of the original staff of the RAO Brisbane to leave the employment of CSIRO.

Ironically, Cliff's departure was the first retrenchment related to the closure of RAO Brisbane which will close its operation by 31 December 1988.

By the proposed closure date a further 18 staff will be retrenched or relocated.

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Although professing a secret yearning to be a pop musician, **Dr Michael Wilson** at the Division of Fossil Fuels has made organic geochemistry his main interest. New revelations into the organic structure of coal, oil shale, humus and petroleum-bearing rocks have just earned Dr Wilson a Doctor of Science (DSc). Dr Wilson is leader of the coal chemistry group at the Division, and has some 120 research papers to his credit, as well as his major work, a textbook titled *NMR Techniques and Applications in Geochemistry and Soil Chemistry*, just published by Pergamon Press in England.

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Benevolent Fund
Cont. from p.6

source of income for the funds, and these are paid by staff usually through salary deductions of no more than 40c a fortnight. There are no restrictions to becoming a contributor and the monies go directly to providing financial assistance to CSIRO colleagues in unfortunate or difficult circumstances.

Staff members are encouraged to contact fund representatives in each division or site for further information, particularly on becoming contributors.

***CoResearch* is produced by the Public Communication Unit for CSIRO staff. Readers are invited to contribute or offer suggestions for articles. The deadline is the last Monday before the issue month. Editor: Liz Tynan, PO Box 225 Dickson ACT 2602. Ph: 48 4479.**

CoResearch

CSIRO's staff newspaper

No. 308 December '87/January '88

CSIRO scientist in at the start of work on anti-AIDS alkaloid

The first clues to the nature of a remarkable alkaloid called castanospermine, now being investigated for its potentially life-saving therapeutic properties, were deduced by an eminent UK scientist in collaboration with a CSIRO scientist.

Dr Merv Hegarty from the Division of Tropical Crops and Pastures started work on the substance with Professor Arthur Bell, director of the Royal Botanic Gardens at Kew in London, back in 1980 – long before any major importance was attached to it.

Castanospermine is derived from the seeds of the Moreton Bay chestnut, a colourful and popular tree endemic in Queensland and parts of New South Wales, as well as several Pacific Islands.

The tree is also known as Black Bean, and its seeds could form the basis of a drug to combat the two modern medical scourges – AIDS and cancer. It is a good example of 'common or garden' plants becoming extremely important to medical science.

Ironically, Professor Bell became interested in the Moreton Bay chestnut because of its reputation for toxicity – indeed it appears the tree manufactures castanospermine for this purpose. Animals eating the leaves or seeds often had very nasty reactions.

Dr Hegarty and Professor Bell collected seed in Queensland in 1980, then isolated the alkaloid and, with Dr Linda Fellows and co-workers, noted that it inhibited the enzyme glucosidase. Work by Professor Bell's student, Dr Liza Hohenschutz at King's College, London, showed that the alkaloid was water soluble – most unusual for alkaloids – and this added to its potential as a therapeutic drug.

It wasn't until 1986 that other research groups started to take a serious interest in castanospermine as an AIDS virus inhibitor.

Since then, researchers at the Fred Hutchinson Center in Seattle have been at the forefront of investigations into the alkaloid's therapeutic possibilities.

Dr Larry Rohrschneider, head of cell biology at the Center (and now temporarily based at the Walter and Eliza Hall Institute in Melbourne engaged in other work) said his initial research in 1986 confirmed its potential as an inhibitor of human immunodeficiency virus (HIV), otherwise known as the AIDS virus.

In vitro tests were run at the Center for about a year, and they showed that the alkaloid could change the virus' surface sugars, thereby preventing it both binding to a host cell or replicating itself.

Pre-clinical trials at the National Cancer Institute in Washington DC have started, and it's hoped clinical trials will start soon.

A Dutch research group recently published findings in *Nature* which clearly pointed to the need to further investigate castanospermine's powerful inhibitory properties. Their results also indicated that castanospermine interfered with the ability of HIV to initiate an infectious cycle by attaching to receptor cells – and it did this without damaging uninfected cells.

On 17 June this year seven of the researchers now working with Professor Bell on castanospermine presented their findings at a Royal Society function. Bell's group has been following the US research and contributing to it.

The results showed that the substance was a 'potent inhibitor' of the sugars on the outer coating of HIV, but had no effect on uninfected cells.

An outline of this work by Professor Bell and his colleagues was also published recently in *The Lancet*. Dr Hegarty's role has been in determining the distribution of the substance in various parts of the plant, advising on methods of isolation, and collecting the seeds from which castanospermine was isolated.

Being based in Queensland, Dr Hegarty is well-placed to obtain samples of the seed.

He is a firm believer that all efforts should be made to ensure castanospermine is commercially extracted in Australia, rather than exported raw. The market possibilities could be enormous should clinical trials confirm its effectiveness against AIDS.

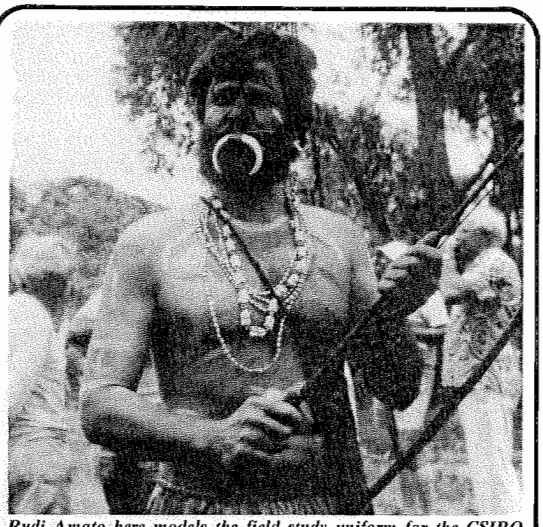
Dr Hegarty is not the only CSIRO member with connections to the castanospermine work. Seed collection has been carried out by several young people on CEP grants who were placed with the Division of Forest Research.

Mr David Cameron from the Division's tree seed centre has supervised the collection project.

The initial request for seeds came from the curator of the Brisbane Botanic Gardens, Mr Ross McKinnon, who had been approached by the Fred Hutchinson Center. One tonne of seed was required. At about the same time, a Sydney company, Phytex, contacted Mr Cameron about getting a substantial amount of seed as well.

This company has developed a process for extracting the alkaloid on a commercial scale.

These requests for seed enabled the two young people on the CEP grants – Lindy Hart and Bryn Gullen – to extend their work with the Division.



Rudi Amato here models the field study uniform for the CSIRO Papua New Guinea group. The group, headed by John McAlpine, is moving camp from the Division of Water Resources Research to Tropical Crops & Pastures in Brisbane, and a farewell BBQ was held in Canberra recently. Rudi, who is admin officer (finance) for the group, took the opportunity to lend an air of authenticity to the proceedings.

1987 McLennan awards

Flying the in face of criticism of Australia's technological and industrial performance, the judges of this year's Sir Ian McLennan Achievement for Industry Award found it so difficult to decide on one winner that they chose two.

Dr Albert Rovira from the Division of Soils and Dr Hari Sinha from the Division of Mineral Chemistry have both received the honour.

The awards, comprising commemorative medals and overseas study visits, were presented on 7 December by the eminent former CSIRO scientist Sir David Zeidler.

•Dr Albert Rovira has been recognised for the work he and his research team have done on cereal cyst nematode (CCN) – a pest which costs wheat growers in southern Australia $80 million a year.

The research, in conjunction with chemical companies and the Victoria and South Australia Departments of Agriculture, has led to a soil test for estimating CCN infestation and to subsequent chemical and soil management strategies to control the pest.

•Dr Sinha's work will result in the world's largest zircon processing plant.

He leads the CSIRO research team that, with an ICI team and marketing company Z-Tech P/L, invented and developed a new process for the

Cont. on p.8

New corporate identity gets OK

After many months of gestation, CSIRO's new corporate identity has finally been given the go-ahead by Chief Executive Dr Keith Boardman.

In a letter seeking support from chiefs and directors for the implementation program, Dr Boardman linked the new corporate symbol with the restructured CSIRO.

'It will be an outward indication to the Australian community that a new CSIRO has come into being — a CSIRO more suited to the needs of the nation, but with foundations based on traditional scientific excellence,' he said.

The corporate symbol was designed by the Melbourne consultants Cunningham and Cummings. This company has also prepared an implementation manual — to be distributed in January — containing specifications for the symbol's use on stationery, car stickers, publications and other products.

Oversight of the implementation program has been given to Dr Michael Dack of the Bureau of Information and Public Communication. The Bureau's regional information managers will be available to assist divisions at a local level through workshops and visits.

CSIRO
AUSTRALIA

Dr Dack believes the time for debating the merits of the new symbol are now over and

Cont. on p.8

From the Chief Executive

A column by Dr Keith Boardman

The year 1987 has been an eventful one for science and CSIRO with the demise of the Department of Science, the transfer of responsibility for CSIRO to the Ministry of Industry, Technology and Commerce and the restructuring of the institutes, divisions and corporate centre of CSIRO following the review of top structure by McKinsey.

The new structure comes into being on 1 January. I look forward to 1988 as a year of greater stability for the Organisation, although the full implementation of the decisions from the reviews by McKinsey and Pappas Carter Evans and Koop will take some time. The selection committees established by the Board for the institute director and corporate centre positions have completed their deliberations and their recommendations will go to the December Board meeting for decision.

A strong and well-balanced team of top managers is a vital component to the excellence of CSIRO's future performance and I am very grateful to the members of the selection committees for the time and effort they devoted to this most important task.

Australia faces a difficult but challenging economic environment, and as the major R&D performer much is expected of the Organisation in strengthening the technology base of Australian industry to improve the nation's performance in the international marketplace.

In a recent speech to the Committee of Economic Development of Australia (CEDA), I stressed that a stronger national research effort is essential to Australia's future prosperity, which will depend on developing a broader, more diverse export base with even more efficient primary industries, more local processing of primary products, more competitive manufacturing sector, more tourism and greater commercial exploitation of our scientific excellence particularly in areas such as biotechnology, new materials, micro-electronics and computer software.

I said that last month's stock-market crash will be a major test of Australian industry's commitment to increasing its R&D activities. If the rise in industry's investment in R&D – still very low by international standards – stalls, Australia will lose any chance of becoming an advanced industrial nation. The success of CSIRO is dependent on a strong R&D effort in the private sector.

There was recent publicity on the relative decline in CSIRO's effort for the rural, minerals and environment sectors. If the processing of products is included, CSIRO devotes 46 per cent of its effort to the rural sector, 16 per cent to minerals and energy and 16 per cent to environment and water.

Research for technology-based manufacturing is 12 per cent and for service industries nine per cent.

Of course, there are strong arguments for Australia to increase its research effort in all sectors, but the realities of recent Government funding for CSIRO mean that increases in one area must come at the cost of another.

Much publicity was given in the press to the complaints of the Officers Association, alleging a lack of consultation between CSIRO management and the OA. In connection with the restructuring, extensive consultation with staff resulted in substantial changes to the original McKinsey recommendations. The recommendations were, in fact, delayed in going to the CSIRO Board so that staff comment on the proposals could be aired.

Each union concerned with the current review of the corporate centre was invited to nominate a representative to interact with the consultants and project team carrying out the review.

Good management in CSIRO includes effective consultation with staff and I support a strengthening of consultation with the unions, but once this has taken place it's the responsibility of line managers to make the decisions and ensure they are implemented.

A team was established to oversee the implementation of changes from decisions on the McKinsey review, and Mr Stephens, the representative of the Consultative Council, is now a member of that team. The Council sub-committees are the logical avenue for greater interaction between management and the unions, and I will move to ensure they become more effective.

I thank staff for their patience and forbearance during the past 12 months and wish you all the best for Christmas and the New Year.

Letters to the Editor

Dear Editor,
SPQR

This year marked the 1580th anniversary of the Roman evacuation of Britain and 1510 years have passed since the formal collapse of the Roman empire in Western Europe. Before and since those epochal events, uncounted billions of people, the majority of them unable to read or write, recognised the acronym above. Even I, whose ancestry is entirely Irish, have known it since childhood, though not a single Roman aquilifer ever set foot among my parents' people. Far away to the east, and equally renowned for their ignorance, millions of Poles have readily recalled those letters, yet, like the Irish, their forebears never sighted the inscription with the legions marching behind to impose the *Pax Romana*.

Because it seemed relevant and because people in our modern advertising industry are also generally perceived to lack erudition, I polled eight acquaintances who are PR professionals. One, a Sri Lankan, didn't have a clue that the letters stand for *Senatus Populusque Romanus* (the Roman Senate and People). Another claimed that he couldn't bring them into focus on the instant, but if I bought him a drink he was sure his memory would clear. The remaining six explained the significance of the letters immediately. *None*, however, could recall the emblem that accompanied the acronym, though I have given you a sufficient hint in the first paragraph.

Now, it seems, CSIRO at awesome cost, is to have a token foist upon it – one seemingly and crudely derived from the insigne of a commercial firm which manufactures shutters whose purpose, or course, is to exclude light and curtail vision, the very antithesis of what CSIRO is all about. ('The falcon can no longer see the falconer!)

Aside from such considerations, the practical fact is that the ordained symbol defies graphic reproduction in the very situations where it could appear most often and be promulgated at least expense. Even if adjusted to resolve this problem, several other graphic difficulties remain inherent in the design.

While no-one would claim that our acronym, CSIRO, will ever be as commonly recognised as SPQR or endure as long, it is already more widely known. Thus Roman logos are not appreciated in Angola, Bangladesh, China, ..Sri Lanka.., or Zimbabwe, whereas quite significant numbers of people other than scientists now identify our inscription in those countries. Needless to say, in the USA, UK, Germany, Japan, etc, the letters CSIRO need no embellishment to win instant recognition in scientific circles and often beyond. Hazarding a guess: possibly no single scientific institution with the exception of MIT, Cambridge and a few others have a higher global profile than CSIRO. (Publication of the *Australian Journals of Scientific Research* by CSIRO partly explains this phenomenon.)

In an age where the dinkus is multiplying far faster than the AIDS virus to have become ubiquitous, it is futile to add another to the existing hordes. The on-going cost of dissemination until competitive dominance has been reached among the wilderness of signs will be enormous, not to mention the incremental costs of regular updates needed to keep abreast of fickle fashion.

Though vastly more might be said, note that the world's best recognised entities do not rely of symbols but merely their names (sometimes as acronyms) and the quality of their product: Rolls Royce, Porsche, Ford, Coca Cola, MacRobertson, spring immediately to mind.

John J Lenaghan
Editorial and Publishing Unit

Dear Editor,

Recently, I received a copy of *Technology Today and Tomorrow*, the Proceedings of the 5th ANZAAS/AIST Conference on Science Technology. These occasional conferences, the first of which was held in 1973, are designed explicitly for non-professional staff to present papers concerning advances in the technological (and other) methodologies of scientific research.

The first two or three conferences were heavily patronised by CSIRO but it is worth noting that not one of the papers in the most recent Proceedings emanate from this organisation. 'Hard times and financial restraint' is the common catchcry employed to limit the 'waste of resources' — in time and money — of allowing less senior staff to present methodological information at conferences.

One wonders how well this attitude sits with our newly recognised responsibility to communicate *all* our work — methodologies as well as results — to potential users.

G H Nicholls
Division of Forest Research

More letters on p.4

Dear Editor,

Let's congratulate ourselves! We are finally to have a corporate identity.

As an expert in the field of logos, I would like to point out a few facts. I have not yet seen the implementation manual, and so I don't know how good it is, but technically the new logo does not meet the Organisation's requirements for reproduction.

It does not tolerate reduction — at 15mm or less the white vertical bars disappear and the typeface breaks up. How will this be overcome when we try to reproduce it on business cards, letterheads, newspapers?

The fact is if you can't successfully reduce a logo to meet the needs of the Organisation then you have missed the most important element in any corporate identity program.

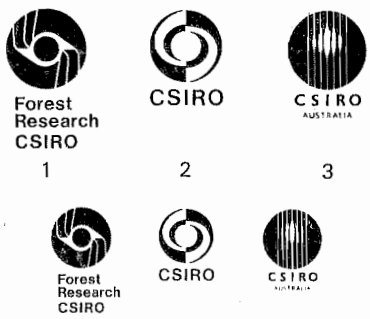
The example I've provided shows the logo's failure to reduce effectively. Alongside it I've shown the logo I designed in 1978 for the Division of Forest Research[1] as well as a CSIRO corporate logo I submitted in the same year[2].

The new symbol is in no way advanced from the design I submitted in 1978. Unlike the other two examples, it does not even stand up to standard graphic design requirements.

I think the CSIRO Divisions deserve some answers on this issue.

And finally could we have the secret meaning of the design itself.

Vlad Mosmondor
Head, graphic design
Forest Research



CSIRO team scrutineers batteries for solar race

Scientists from the Division of Mineral Chemistry played a key role in last month's World Solar Challenge — a race for solar-powered vehicles from Darwin to Adelaide along the Stuart Highway.

In each vehicle, the electricity derived from the solar panels was stored in batteries. To maintain keen competition, it was decided to allow replacement of the whole or part of each vehicle's battery pack in the event of malfunction or accident.

This presented the organisers with the major problem of how to formulate an effective and universal penalty for battery replacement.

Without such a penalty, it would have been possible for competitors to gain strategic advantage with healthy batteries, e.g., during overcast skies, head winds, hill climbs, or final stages of a day's racing. Such action would have boosted vehicle performance through, in effect, injection of fossil fuel, and not solar energy.

The problem was further exacerbated by competitors being allowed to use different battery technologies.

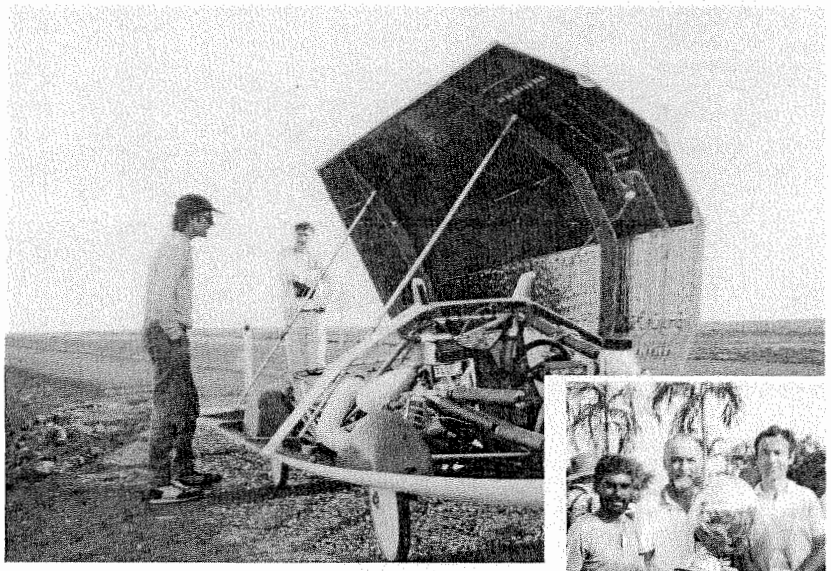
The development of a universal battery-replacement regulation that would take into account all these factors was a monumental task. Nevertheless, Dr David Rand (manager, energy storage section) devised a regulation that was considered to be a comprehensive solution that neutralised all of the perceived opportunities for gamesmanship.

The regulation demanded that vehicles be held by the roadside for a set period in the event of battery failure. Thus, the organisers' objective of running the World Solar Challenge as a solar race, and not as a battery race, was achieved.

Dr Rand, assisted by his colleagues Warren Baldsing and John Hamilton, conducted pre-race scrutineering of the vehicles' battery packs and calculated the respective time penalties based on battery energy density and the number of whole (or part) replacements effected. The performance of exotic batteries was determined using the Division of Mineral Chemistry's battery testing facility.

The CSIRO team followed the vehicles down the track and were on hand to adjudicate in times of crisis. The race was comfortably won by the General Motors 'Sunraycer' vehicle that covered the 3004 km course in 44 hours 54 minutes (66.92 km/h). The outstanding performance of this vehicle will be celebrated by a Presidential reception at the White House.

A full report of the race details will shortly be available from Dr Rand on (03) 647 0211.



Above, early morning charging of Sunraycer solar panels, Woomera. Inset, the CSIRO team 'minds' the World Solar Cup (donated by The Broken Hill Associated Smelters Pty Ltd). Left to right, Warren Baldsing, David Rand and John Hamilton.

How a calculator, pencil and paper made sense of Viking data

Two days' work by a CSIRO scientist with a hand-held calculator and a pencil and paper has put data from the NASA Viking probes on Mars in a new light.

After examining data on CO_2 in the Martian atmosphere, Dr John Philip, Chief of the Division of Environmental Mechanics, has come up with results which have changed the way scientists view the meteorology of Mars.

'[The work] has made the first real sense of data that cost billions of dollars,' said Dr Philip.

The saga of his involvement with the project goes back to 1976, when NASA was planning the Viking mission. Dr Philip was invited to contribute to a symposium on water on Mars.

'NASA wanted experts on how water behaved on Earth to examine aspects of how it might behave on Mars,' said Dr Philip. 'I contributed to their 1976 meeting and to a second one in 1978. Then I heard nothing until last year, when they invited me to a meeting concerned with analysing the results from the Viking mission.'

CO_2 entered the story at the second meeting, when Dr Philip realised it was more interesting in terms of its role in the Martian atmosphere than water.

Mars' atmosphere is more than 95 per cent CO_2, compared with Earth where the percentage is around 0.03.

Under the Martian atmospheric pressure (about 170th that of Earth), CO_2 condenses into dry ice at -123°C. Towards the poles, Martian winter surface temperatures fall below this level, but go well above it in summer.

'Because of this, enormous quantities of CO_2 condense out of the atmosphere at high latitudes each winter and evaporate each summer,' he said. 'When I say "enormous", I really mean "enormous" – there is a twice yearly fluctuation of the total CO_2 in the atmosphere of ±14 per cent.'

This constant condensation and evaporation locks up and releases huge amounts of energy, and the meteorology of Mars is dominated by this bi-annual cycle.

There is a strong asymmetry in this process, with much more CO_2 involved in the southern hemisphere than the northern. It is very important to know the quantities in each polar cap – and the first real data on this was information on the bi-annual cycle of total atmospheric mass which was in from the Viking landers in 1979.

'When, after eight years of working on terrestrial things, I was asked by NASA to take part in the 1986 meeting, my first job was to check the scientific literature on what had been made of the Viking data.

'I found that scientists working under contract to NASA had simply published the data on the bi-annual cycle and had then estimated the quantities of CO_2 at each polar cap on the assumption that each pole operated in isolation,' said Dr Philip.

'Quite frankly, I was amazed that so little had been done with data that cost so many billions of dollars to get.'

Dr Philip reasoned that what was happening at each polar cap should follow the same pattern in time as what happened at the other one half a year earlier.

'This very reasonable assumption showed that the CO_2 turnover rate at the two polar caps was more than twice the NASA estimate, which didn't take account of the fact that evaporation at one pole and condensation at the other took place together.

'This new result radically changed the picture of the atmospheric heat engine which drives the meteorology of Mars,' he said.

Dr Philip's work on the Viking data has had plenty of benefits for his Division. NASA supported his visits to America, and during these he was able to make side visits to about 20 laboratories working on soil physics and micrometeorology closely related to the Division's more Earthbound research – at virtually no cost to CSIRO.

This story is based on an interview with Dr Philip aired on ABC radio station 2CN in Canberra last month.

The CSIRO Melbourne Show display has won an award for the best exhibition in Victoria this year.

Awarded annually by the Australian Display Manufacturers Association, entries for the award are judged not only on their design factors, such as innovative use of materials, colour and graphics, but also on the ability to achieve objectives.

A plaque was presented to CSIRO at a special ceremony early this month.

DIT re-engineering diagnostic system

The Division of Information Technology has started a collaborative project with the Garvan Institute of Medical Research in Sydney to re-engineer the knowledge for its thyroid assay expert system.

The aim is to redesign the system using what has been learned from the SIRATAC cotton management system also being reworked by the Division (see *CoResearch* 302, May '87). The Garvan system has become increasingly complex as more and more elements are added to it, and has therefore become difficult to maintain.

Initially, the project is focusing on the existing thyroid assay system which examines blood samples to determine thyroid disorders. However, the leader of the re-engineering group, Mr Paul Compton of the Garvan Institute, said it was intended that the system would eventually be able to interpret other hormone disorders, and would also be made available to other hospitals.

The project will continue the work on 'data dictionaries' begun with the SIRATAC project, to discover whether or not the knowledge documentation facilities of a dictionary are suitable to enable endocrinologists (hormone specialists) to maintain the knowledge base in the system without having to know all about the system, eg. artificial intelligence languages.

About 10 000 interpretations per year are now done on the three year old system, and there is an error rate of approximately three per thousand. Every time an incorrect result is discovered, the 'rules' in the system are changed to take account of the variation. This means that the system is being changed continually, to the point where it has become difficult to manage.

Torres Strait discovery

Two new bats for the belfry

After 200 years of European settlement and natural history research in this country, it is amazing that animals new to science are still being discovered, especially those that are large and obvious. Recent field work on Torres Strait islands has revealed two new bats — a small insect eating species and a larger flying fox.

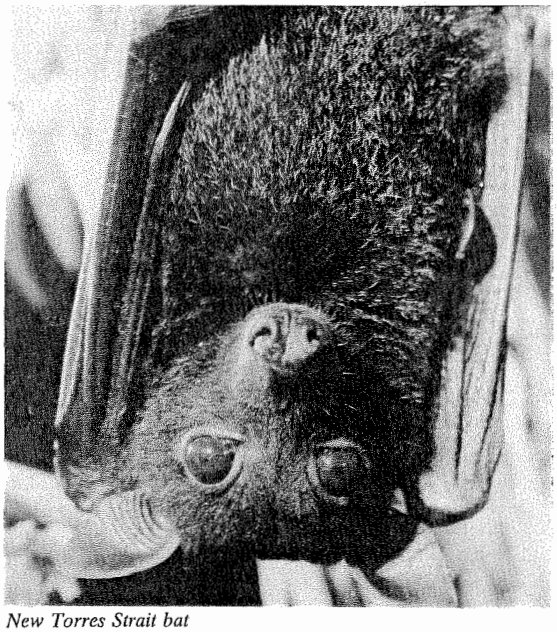
Both of these creatures have never been scientifically described or named. The insect eater appears to be related to species in Indonesia and is a tiny animal — only about 12–15 grams in weight and with a wingspan of about 30cm. The flying fox, a fruit eater, is perhaps even more exciting and important because it is so unlike the bat fauna found in the Pacific and Australia.

Mr Greg Richards, a senior technical officer from the Division of Wildlife and Rangelands Research in Canberra, and Mr Les Hall, formerly with the Division but now with the University of Queensland, have undertaken two visits to Torres Strait during the past few years.

Their work involves basic studies on bat distribution, providing baseline information for the quarantine of screw-worm fly and rabies. It is well known that this region is a buffer zone against many diseases, but little attention has been given to the possible role of a highly mobile bat fauna assisting these diseases to cross the buffer.

It isn't yet known whether the flying foxes have made or could make the 60km flight across the Torres Strait to the Australian mainland, maybe carrying screw-worm fly or rabies. Rabies is not a problem in the region, although one case was reported recently in Irian Jaya.

While working on Moa Island and based at St Pauls Mission, Greg and Les caught several of many flying foxes that were feeding in native almond trees, devouring hundreds of these large and fibrous fruits. Their excitement at finding a new animal added to the bewilderment of the local population, who were already quite vexed by the huge mist nets strategically set around their village.



New Torres Strait bat

The villagers were well used to the existence of these 'sapural' (as they called them), and they featured in several of their myths and legends. These stories relate to the appearance of the bats signalling the start of a new fruit season, as the animals feed on mangoes and other tropical fruits in the region.

The flying foxes are a staple food in many islands in the region. In fact, capture of the animals for food has led to populations declining on some islands in Micronesia.

Greg eventually got up the courage to sample fried flying fox, and reported it had rather a 'gamey' taste, not unlike rabbit.

Four species of flying foxes were previously known in Australia, all of which had been described by the mid 18th century. One can expect that in a region such as Torres Strait there may be many small creatures still undiscovered, and quite likely to be close relatives of Papua New Guinean animals, but it seems the new flying fox may in fact be related to the South East Asian fauna.

It is quite different to the Pacific flying fox, as revealed by DNA sequences in tissues processed in West Germany, by ectoparasite species, and by neuroanatomical characters.

The flying fox discovered by Greg and Les is about three-quarters the size of other flying foxes found in Australia.

Greg and Les are now involved in the long process of taxonomic description of their new bats, and will return to Torres Strait next year to survey the bats on more islands.

Dr Thomas to go to Bond Uni

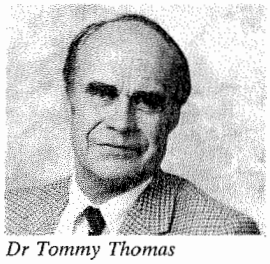
Foundation Chief of the Division of Information Technology, Dr Tommy Thomas, is to play an integral part in the establishment of Australia's first private university.

Dr Thomas has been appointed Professor of Computing Science at Bond University on the Gold Coast and will take up his position next year. His initial task will be a broad one – to engage in academic planning of computer science, communication engineering and information engineering as well as the development of the Research Park.

Once Dr Thomas' planning role phases out and the (as yet unbuilt) University starts enrolling students, he will maintain responsibility for the Research Park and its links with industry, the University, other Universities and the governments.

The Research Park, to be built on a 20 hectare site adjacent to the University, will encompass academic study, research, consultancy and marketing.

Dr Richard Tweedie, first managing director of the AMDEL/CSIRO owned consultancy SIROMATH has been appointed Professor of Information Science at Bond University. SIROMATH was set up as Australia's largest high level mathematical and statistical management organisation and software distribution group.



Dr Tommy Thomas

Letters

Cont. from p.2

Dear Editor,

CSIRO currently owns some $600 million worth of 'bricks-and-mortar' real estate. The very buildings upon which the Organisation's research depends. Within these buildings a further $50 million worth of mechanical plant operates to control conditions.

In all, some $650 million worth of assets that no-one wants to know about!

The ultimate responsibility for maintaining these invaluable assets must lie with the CSIRO Board, yet, whether by accident or design, the Board has abrogated this responsibility.

I refer to the "devolution" of all repairs and maintenance matters to Divisions.

Confronted, for many reasons, with an increasingly desperate situation in maintaining the Organisation's assets Headquarters have, without any external consultation such as has been sought in all other reorganisational matters, passed the 'Repairs and Maintenance' problem to Divisions.

Their desire to be rid of the problem is such that private enterprise groups interested in maintaining the Organisation's assets have been told to speak separately to the 40 or more Divisional Chiefs and not to the corporate body.

While some Divisions have officers who have some management function relating to repairs and maintenance, many have not.

Even for those who have such staff it is an all but impossible task to document each and every building plus every single item of plant within every building, design maintenance schedules for both buildings and plant, draw up comprehensive specifications to cover this maintenance, call tenders for this work, then vet and let the tenders, *all by June 1988*. The work must then be supervised to ensure it is performed according to the specifications. All this over and above the normal Divisional duties for the staff concerned.

How are the Divisions and Stations without these officers going to manage? Headquarters can offer very little assistance.

In future years when the Organisation's assets begin to fail (as they are already) who is to accept responsibility?

It is clear that the Divisions will be blamed — blamed for not doing a job they were never set up to do; blamed for not looking after $650 million worth of Organisational assets which the Board did not want to know about.

If ever we needed leadership we need it now, Mr Wran — to save the Organisation's infrastructure from ultimate decay and collapse and enormously expensive replacement costs.

Murray S Upton
Manager, engineering services and buildings
Division of Entomology

Dear Editor,

I support the letter of F A Blakey, *CoResearch* 307, where he suggested that for CSIRO to earn a large part of its funds from industry constitutes a form of 'hidden privatisation'.

Exploitation of a resource is a business system; the resource itself is not. A national research organisation supported from appropriation funds is a logical choice for the study of national resources.

At Irrigation and Freshwater Research we serve the industry of irrigated agriculture, but we are also interested in inland freshwater as a national resource. Fisheries and forestry are other examples of national resources that need study of the resource itself as well as techniques for exploitation.

David Erskine
Centre for Irrigation and Freshwater Research

Dear Editor,

The decision to have a total ban on smoking in CSIRO premises is an excellent one. Leaving aside the obvious damage to the health of smokers, and to those unfortunate enough to be near them, there are other important aspects. Smoke, cigarettes and discarded tobacco stink. Ash and butts scarcely enhance the appearance of tables, desks and the like. Smokers themselves are very unpleasant to smell and taste, except I suppose to other smokers. And let us not forget the words of Red Ingle and his Natural Seven (c1940) (and slightly smoothed), *viz:*

"Cigarettes are a blot in the whole human race,
A man is a monkey with one in his face.
Here's my definition, believe me dear brother:
A fire on one end and a fool on the other."

I W Smith
Division of Fossil Fuels

— Clarification —

During a report on Mr Wran's address to Chiefs on page 1 of the November issue,* CoResearch *stated as one of the major requirements of the Government was that a goal of 30 per cent outside funding was to be achieved in a maximum of three years. Although Mr Wran emphasised to chiefs that there was a very strong expectation that this target was to be reached,* CoResearch *wishes to clarify that it is not a formal Government requirement (i.e. not the subject of a Cabinet decision) but is an informal goal being set in a co-operative spirit with the Department of Finance. Mr Wran emphasised that the timescale for achieving 30 per cent external funding was still to be established.

More diversity for northern cattle industry through import plan

In a cattle-improvement project on a scale never before undertaken in Australia, the Division of Tropical Animal Science plans to bring two African cattle breeds into Australia to help boost productivity and fertility for our northern cattle industry. The plan is being implemented by the Division's Tropical Cattle Research Centre at Rockhampton.

The move, foreshadowed by *CoResearch* in March 1986 (see issue No. 289), will be a delicate and costly operation involving the implantation of Boran and Tuli embryos, collected from fully health tested cows in Zambia and Zimbabwe, into recipient cows from Australia on the Cocos Islands and shipping the resulting health checked calves into Australia.

This project has only become possible now because of the removal of certain restrictions and the development of advanced technology. Previously there was an embargo on the export of cattle embryos from Africa, and prohibitive quarantine restrictions in Australia. Now that the Department of Primary Industry has established a quarantine station on the Cocos Islands, the way has been cleared for the operation.

Development of embryo transfer technology and the identification of desirable genetic material by DTAS scientists completes the picture.

A prospectus has been prepared by Sirotech to seek industry involvement and funding. Interest has already been expressed by a number of commercial parties. (See separate story).

Project leader Dr John Frisch is in Africa now supervising the health checks on donor cows and the collection of embryos.

Dr John Vercoe, OIC of the Centre, said Boran and Tuli cattle are particularly useful because of their resistance to environmental stresses through both natural and man-directed selection which has led to high fertility. The Boran is considered most useful in harsher tropical conditions, while the Tuli should find its greatest use in the sub-tropics and more benign areas of the tropics.

Both breeds, and particularly the Boran, show good tick resistance – an essential characteristic for economic viability.

Dr Vercoe's hope for the project is that it will give northern cattle breeders a greater variety of management options and lift the level of productivity.

The health testing procedures for bringing the new cattle into Australia could hardly be more stringent.

Once the donor cows are selected by the relevant breeding societies on the basis of certain strict criteria, they are placed into separate paddocks, and blood samples are taken and tested for seven strains of foot and mouth disease and the viral disease (not found in Australia) called lumpy skin, as well as several other serious diseases.

Health tests

Those animals tested negative are moved to a quarantine area, where they are closely watched. After three weeks, the one week old embryos are collected from the cows, then two weeks after collections are completed the cows have more blood taken for further health tests.

At collection the embryos are washed eight times to ensure they are free of surface viruses. The Division is flying in 600 litres of triple-distilled 'embryo grade' water for this purpose.

Once the all-clear is given, the frozen embryos are to be shipped to the Cocos Islands (in the Indian Ocean to the northwest of Australia). There they will be implanted into cows brought in from Australia specially to gestate the embryos.

Three months after birth the calves will undergo rigorous testing, with blood samples being sent to AAHL and the UK. If they are clean the calves will then be imported to Australia.

When they arrive, the next step will depend on how the project is commercialised. Stock multiplication may take place on the properties of participating graziers or on a property bought for the purpose.

The project is in three stages: the actual import of the calves, expected to be completed by October 1989; building up of the herd to 600-1000 animals, to be undertaken between October 1989 and October 1995; and the start of the fully commercial Boran and Tuli stud from October 1995 onwards.

Stage two of the project will involve use of the Division's multiple ovulation and embryo transfer technology (MOET), which has been developed at the Division over the past three years and will enable more rapid multiplication of the herd through embryo splitting and implantation.

It is expected that should the project come to fruition, the cost in 1987 dollars to CSIRO and commercial partners will be about $8 million. Revenue from the new breeds will not start until 1992/93, when it's estimated income will be $600 000 from sale of semen and some embryos, rising to $4-$7 million in 1995/6 when the stud should be fully operational.

Dr Alan Donald, right, acting director of the Institute of Animal and Food Sciences, inspects posters on the importation of African cattle at the Tropical Cattle Research Centre in Rockhampton with Richard Wilson, chairman of the Division of Tropical Animal Science advisory committee.

Commercialising the Boran and Tuli project has so far involved the preparation of a comprehensive prospectus in conjunction with Sirotech, and placement of newspaper advertisements calling for expressions of interest.

People responding to the ads were sent copies of the prospectus. In addition, prominent graziers, venture capitalists and others who could be interested in the project also received the document. About 40 have been distributed.

The prospectus contains a project summary, an outline of various characteristics of the breeds (like fertility and growth rates) relative to Brahmans and 'synthetics' based on all three breeds, cost and revenue estimates, outlines of possible commercial arrangements such as joint ventures and collaborative agreements, information about R&D tax incentives, and other details needed to get the attention of a prospective business partner.

There has been considerable interest, although no-one has yet laid any money on the table.

In collaboration with divisions, Sirotech has developed a number of similar prospectuses as an effective means of promoting business opportunities to potential industry partners.

Sirotech gives high priority to promoting those businesses with substantial market potential – with sales of at least $1 million per year and preferably $5 million or greater.

Dr David Wilson, who is overseeing the commercialisation of the cattle project, said he is interested in hearing from companies who may be attracted to the project and other such opportunities.

He also said Sirotech was willing to talk to researchers who believed they had projects with a good chance of commercialisation and potentially substantial returns.

Chairman of the Division's advisory committee and well known central Queensland grazier, Mr Richard Wilson, said the committee fully supported the proposal to import the cattle and saw it as a good example of CSIRO helping industry and at the same time getting a return on its investment.

'Crossbreeding to exploit hybrid vigour is one of the more attractive and practical ways for graziers to obtain a quick increase in beef production,' said Mr Wilson.

'The investigations to date suggest that the Boran and Tuli have the potential to improve the productivity of the predominantly Brahman-based cattle herds in northern Australia.

'However, we will only know for sure how they will perform in Australia by importing them and CSIRO should be congratulated for its initiative in putting up this proposal.

'I see CSIRO's role as establishing the project in a joint venture with industry and then for CSIRO to withdraw when scientific aspects of the venture have been adequately researched.

'I believe it is essential for industry to be involved in the project right from the start and I am pleased with the amount of consultation that has already taken place between the Division and industry,' said Mr Wilson.

Members of the CSIRO Board took time out from their meeting in Sydney on 24 November to share a BBQ lunch with staff at the Division of Animal Health's McMaster Laboratory. Above, Chairman Mr Wran, urged on by Mr Graham Spurling, wonders how much to tip the chef, Dr Keith Boardman thinks he sees something unpleasant on Mr Spurling's shoulder, and Professor Sir Gustav Nossal calculates the calorific value of the salad. Photo: Maria Basaglia, Applied Physics.

Allergy research

Promising work runs out of funds

The following article is about a research project in jeopardy. It is not unique in CSIRO. Many projects are facing severe cutbacks or even termination because of a drop in appropriation funds and difficulties in securing sufficient (or any) outside funds. This project, at the Division of Tropical Animal Science, did get outside funding, but it illustrates the problems faced when this money cannot be guaranteed for the life of the project. Much has been achieved already, but taking the research further into even more useful and potentially profitable areas looks like being impossible, simply because the money will soon run out.

Experimental scientist at the Division of Tropical Animal Science, Maryann Gauci, is 'snowed under' by a mountain of paperwork. She is undertaking the laborious task of writing up the results of phase one of an investigation into the allergic reactions suffered by humans in contact with Australian paralysis (or 'scrub') ticks. She is also completing a PhD thesis based on her work.

The project is one of only two in CSIRO to have current funding from the National Health and Medical Research Council, although this money runs out early next year and will not be renewed, at least in the short term.

Ms Gauci has been under the supervision of chief investigator for the project, Dr Bernard Stone, who is a senior principal research scientist at the Division's Long Pocket Laboratories in Brisbane. Dr Stone has done considerable work himself on the Australian paralysis tick, concentrating on its effects on animals, principally domestic pets and livestock. He is very enthusiastic about the high standard of work carried out by Ms Gauci.

Ms Maryann Gauci

The research has been done in conjunction with a clinical immunologist and a paediatrician from the Child Health Department at the University of Queensland (both of whom are based at Brisbane's Mater Hospital and supported by a grant to the University from the Mayne Bequest Fund). They are Professor Y H Thong, professor of immunology (Ms Gauci's University PhD supervisor) and Dr Richard Loh. The project has been running just over two years.

A wide variety of unpleasant symptoms have long been reported from people exposed to the Australian paralysis tick, which is found mainly along the east coast. Until this project started, however, nothing had been done to research the cause of the reactions, to study the components of tick saliva that induced the allergy, to assay serum IgE specific for the paralysis tick salivary components, or to research the possibility of producing a desensitising preparation to aid highly allergic people.

Like bee stings, paralysis ticks occasionally induce anaphylactic shock in humans – a potentially fatal systemic reaction which usually needs to be treated with adrenalin to prevent death. People who know they may have an anaphylactic reaction to bee stings often carry their own adrenalin kit (containing items such as a prepacked adrenalin syringe or an isoprenaline asthma 'medihaler') in case the worst happens.

Those who have dangerous reactions to bee stings may not necessarily have the same reaction to ticks — and *vice versa*. How do people know whether they will have such a reaction if a tick attaches to them? In case of anaphylactic shock it is essential that adrenalin or isoprenalin be administered as quickly as possible, so obviously it would help if the victim could understand the cause of his/her illness so treatment could be immediately forthcoming.

Diagnostic assay

The work done by Ms Gauci and her colleagues has resulted in the development of a diagnostic assay to determine whether or not humans are allergic.

The assay detects a specific antibody — tick-induced IgE. It seems that people with raised IgE antibodies in their blood are allergic to the ticks.

The assay is particularly useful when undertaken in conjunction with a skin prick test based on crude whole body extract which has recently been improved by using a purer source of allergens, or components of tick salivary glands which cause the allergic reaction.

The project started with a questionnaire distributed to a pool of volunteers available partly through Dr Stone's contact with people involved in bushwalking and other outdoor activities such as members of the Scout movement. Volunteers also came forward through the co-operation of a pathology company which made the forms available to its patients and collected all the blood samples.

Blood from about 60 people was collected and analysed to determine the level of IgE antibodies and their relationship to degrees of allergic reaction.

The preliminary results showed the following approximate breakdown:

Potentially life-threatening reaction:	*17%*
Generalised allergic reaction:	*12%*
Large local reaction:	*36%*
Unusual (delayed) reaction:	*12%*
No allergic reaction:	*23%*

It is not fully understood why people have such different allergic reactions to the same irritant. To complicate things further, there are a number of unpleasant reactions which are not allergic in nature.

The small local non-allergic reactions manifest as a painful, itchy swelling at the site. The large reactions may be found in both allergic and non-allergic individuals.

Neuromuscular paralysis which may occur after a tick has fed for several days on animals or humans is caused by the toxin, not by the allergens.

The assay developed during the project helps differentiate between the truly allergic individual and the non-reactive person.

Miss Gauci has done some valuable basic research on the mechanisms responsible for tick allergy and according to Dr Stone has had some 'excellent' results. She has been able to separate out from the tick saliva glands the specific proteins causing the reactions, and has found that there are relatively few.

This is interesting and important because it leaves the way open to develop a purified desensitising agent. When there are a number of allergy-causing proteins to be dealt with, the necessarily broader-spectrum desensitising agent could cause unforeseen and unpleasant side-effects.

Development of a desensitising agent could take some time because of the stringent requirements of the Commonwealth Department of Health on clinical trials. Once a preparation is ready for testing it must be stored for one year for assessment of potency after storage before trials can commence.

But...it now seems unlikely that this phase of the work will even start, although the groundwork has been successfully completed. Of course it is a great disappointment to Ms Gauci and Dr Stone, but it is also to a certain extent a waste of some first class research, and a missed opportunity.

A desensitising agent for paralysis tick bite may not save a large number of lives but it could prevent a great deal of suffering among the many thousands of people exposed to the tick on the highly populous east coast of Australia. It also could be a profitable little development for some pharmaceutical company. Now, although a very useful assay has been developed, the full potential of the research seems unlikely to be realised.

How many other researchers are facing up to this painful outcome to their meticulous and time-consuming work?

New insights into dietary fibre

A major collaborative research project now underway between the divisions of Human Nutrition and Food Research, with industry partners, is looking at dietary fibre and its possible role in preventing heart disease and bowel cancer.

The project was one of the topics discussed at an interdivisional workshop on dietary fibre held at Food Research's North Ryde Laboratory last month.

This project could have important ramifications in the study of nutrition, and perhaps eventually in helping to improve the health and quality of life in Australia as well as assisting the food industry to use up many plant by-products that are essentially waste materials.

The upsurge of interest in dietary fibre among researchers is partly because of new knowledge which has led to our understanding of fibre undergoing major revision in recent years.

New research has now changed the view that wheat bran is the best form of dietary fibre. Other fibre such as that found in oats, rice, barley and legumes (e.g. soya beans) has greater benefits because of its apparent ability to lower plasma cholesterol as well as being fermented by the bowel flora.

The fibre project mentioned above is one of several collaborations between the two divisions.

The other projects are: researching the possible effects of dietary fibre on the availability and absorption of vitamins, minerals and other nutrients; and the investigation of new sources of fibre in the diet. This will include modifying existing types of fibre to improve their acceptability and value.

Other novel sources of food fibre, such as lupins and the residue from fruit and vegetable juice extraction, may be available in the future, and these were discussed at the workshop.

The workshop involved 31 participants, including the Director of the Institute of Animal and Food Science Dr Alan Donald, who, according to Human Nutrition scientist Dr David Topping, is 'very supportive' of the dietary fibre work being done at the two divisions.

A task force was established to identify, within six months, the most appropriate procedures for chemical analysis of dietary fibre in foods.

This group comprises Dr David Oakenfull (Food Research), Dr David Topping, Dr Dai Suter from NB Love Industries, Professor Bruce Stone from Monash University and Dr Norman Cheetham from the University of New South Wales.

Old days and changing times theme at launch of CSIR book

The official launch of Professor Boris Schedvin's history of CSIR in Canberra last month was an opportunity for a number of old CSIRO hands to get together.

Among the guests were three ex-Chairmen of CSIRO — Sir Frederick White (Chairman 1959–1970), Sir Robert Price (1970–1977) and Dr Paul Wild (1978–1985).

A number of retired CSIRO employees, including the oldest living CSIR appointee, Jack Cummins, and other identities including Sir Otto Frankel, Gratton Wilson, Ken Ferguson, Jack Coombe and Ken Prowse also attended.

The focus of the occasion — Professor Schedvin's book *Shaping Science and Industry: A History of Australia's Council for Scientific and Industrial Research 1926–1949* — is the first comprehensive book about CSIRO's predecessor.

Science and Small Business Minister Barry Jones addressed the gathering, praising Professor Schedvin's book as 'a free and critical account of one of Australia's greatest institutions'.

He said the history was interesting for a number of reasons, not least because it enabled readers to gain a sense of perspective about the work of CSIR and identify the Organisation's past strengths and weaknesses.

He said CSIR epitomised the efforts to harness science to meet national needs, and likened the aims of the current reorganisation to the original structure and role of CSIR.

Professor Schedvin was commissioned to write the history of CSIR/CSIRO by the then-Chairman Sir Robert Price in 1976.

He said he took on the project rather 'naively', never imagining it would take 11 years for the first volume to be published (the second, covering the birth of CSIRO in 1949 and following its development through to the 1970s, probably will be completed in the summer of 1987/88 and released in 1990).

It was originally intended that the work would take about four years, but two years into the project Schedvin was appointed to the Chair of Economic History at the University of Melbourne, and this necessarily put heavy demands on his time.

Also, the sheer volume of records to sort through was a massive and time consuming task.

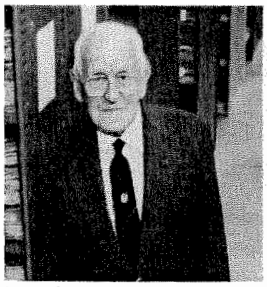
In his address at the launch, Professor Schedvin singled out CSIRO archivist Mr Colin Smith for particular praise, saying that his assistance (and that of his staff) had been invaluable. He said Mr Smith, virtually singlehandedly and in the face of considerable odds, had established and built up the CSIRO archives into a valuable resource for historians, and had ensured the preservation of vital and irreplaceable records of science in CSIRO.

Professor Schedvin drew heavily on CSIRO's archival records, as well as information provided by a number of past employees such as Sir Frederick White, in preparing the book.

His major objective in writing the history, he said, was to explain the way CSIRO acquired such a distinctive structure and ethos.

In doing this he has examined the personalities (such as Julius, Rivett and Richardson) and the times which shaped the organisation.

At the launch, Professor Schedvin also had some observations to make about our current period of change.



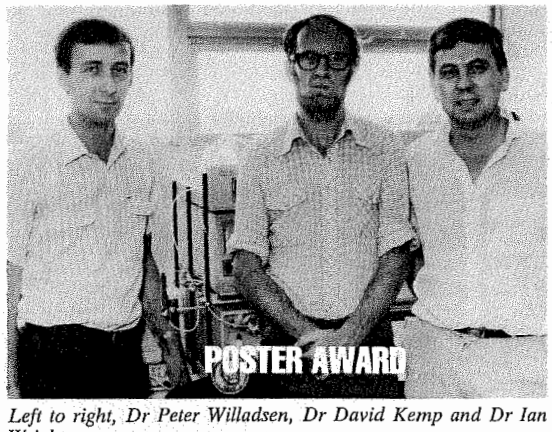
Mr Jack Cummins, the oldest living CSIR appointee, came to Canberra for the launch of Professor Schedvin's book. He took the opportunity to visit the CSIRO archives at Fyshwick to do some research of his own. He is pictured here with some of the rows of records.

'My historical sense tells me that CSIRO is again being reshaped under the pressure of national economic need, and that the future may have more in common with the experience of CSIR than with the comparatively tranquil 1950s and 1960s,' he said.

'History also suggests that a publicly-funded national research organisation will continue to be essential in the future of this country.'

Professor Schedvin's book is available at a discounted price to CSIRO staff from the CSIRO Bookshop. Orders should be directed to the Bookshop at 314 Albert Street, East Melbourne, VIC 3002. The recommended retail price is $29.95, less the 25 per cent staff discount.

Professor Schedvin



Left to right, Dr Peter Willadsen, Dr David Kemp and Dr Ian Wright.

Three scientists from the Division of Tropical Animal Science were recently awarded the Laveran Medal for the best poster on babesiosis displayed at the 3rd International Conference on Malaria and Babesiosis held in Annecy, France from 7–11 September.

The medal is named in honour of Dr Alphonse Laveran, a French military surgeon who was first to identify the malarial parasite in preparations of human blood.

The scientists, Dr David Kemp, Dr Peter Willadsen and Dr Ian Wright all work at the Division's Long Pocket Laboratories in Brisbane on vaccines against cattle ticks and tick-borne diseases. The prize-winning poster depicted the effect a vaccine against cattle ticks would have on the incidence of the protozoan disease, babesiosis, which is spread by the cattle tick.

Oceanography research to hit the airwaves

The Division of Oceanography's climate research will be shown to a huge international audience when an $8 million American-produced television series goes to air.

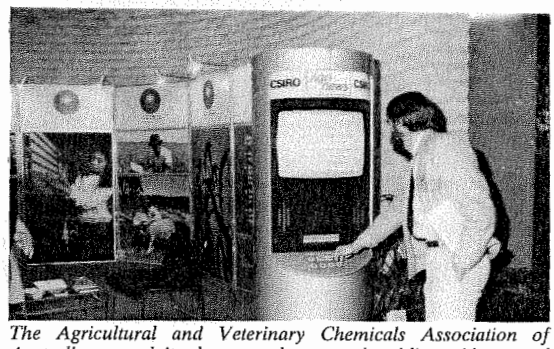
The Division's work is outlined as part of *The Blue Revolution*, a nine-part series being produced by the US Mare Nostrum Foundation. It has taken seven years to research the program, which is due for release in the USA, Japan and Australia in 1989.

Three film crews are working around the world gathering material for the program, which is about man's relationship with the ocean.

Written by marine biologist Dr Luc Cuyvers, *The Blue Revolution* will be seen by about 15 million television viewers during its first broadcast, in prime time, on the US Public Broadcasting Service.

The promised feature on gallium arsenide has been held over until the next issue of* CoResearch, *to be published in early February 1988.
Incidentally, that issue will look rather different, with a redesigned masthead incorporating CSIRO's new corporate identity. This means the red goes and blue will become our featured colour.

CSIRO at the AVCA convention



The Agricultural and Veterinary Chemicals Association of Australia opened its doors to the general public at it's annual convention in Sydney 8-10 November. The keynote address was given by the Chairman of CSIRO, Mr Wran, and the CSIRO exhibit was a major attraction in the public information and education display. The Film & Video Unit's Agri-News *video-disk production (pictured above), which featured 21 news stories on CSIRO's agricultural research, was particularly popular.*

Division markets consulting skills direct to diplomats

The Division of Wildlife and Rangelands Research isn't waiting for the proposed new environmental consulting venture to be set up (see *CoResearch* 307, November 1987). It has taken its own steps to boost consulting work by inviting a number of foreign diplomats to view its work in Canberra and pushing the message that the Division is available for international consulting.

Its 'Exposition of CSIRO Expertise and Consulting Capability in Wildlife Conservation and Land Management' was held in late October and attracted representatives from 15 embassies or high commissions based in Canberra.

Participants were from: Bangladesh, China, Egypt, India, Indonesia, Iran, Jordan, Malaysia, Mexico, Nigeria, Pakistan, the Philippines, Saudi Arabia, Sri Lanka and Zambia. In addition, there were representatives from ACIAR, ADAB, Austrade, the Department of Arts and the Environment, the Australian National Commission to UNESCO, the consulting company Hassall & Associates, and CIRC.

The program focused on four facets of the Division's work – vertebrate pest control, wildlife conservation and sustained yield harvesting, land use planning and rangeland management.

The Division said 'we believe our scientists are the best in the business and our expertise is a resource which should be available to business, industry and government. The Division is available for consulting work at all levels.'

Organiser Dr Rhondda Dickson said while it was too early to tell whether any work would be generated for the Division as a result of the exercise, the immediate response from the diplomats to the presentation had been very favourable, with at least one specific project being developed further.

New AATSE Fellows

The following CSIRO scientists were admitted as Fellows to the Australian Academy of Technological Sciences and Engineering at its last annual general meeting:

Dr George Alexander

Dr Alexander, chief research scientist at the Division of Animal Production, is internationally recognised for his contributions to the understanding of reproduction in sheep and the survival of neonatal lambs. The results of his studies of cold and heat stress and maternal behaviour have been applied widely in sheep husbandry. Dr Alexander recently marked his 40th anniversary with CSIRO (see *CoResearch* 299, February 1987).

Dr Elizabeth Dennis

Dr Dennis is a principal research scientist with the Division of Plant Industry. She is a leading plant molecular biologist with high international standing in the study of transposable elements and the control of genes in maize and *Tripsacum*, particularly the gene for alcohol dehydrogenase. Her work has led to the establishment of a commercial collaboration with the Agrigenetics Corporation. Dr Dennis did some post-doctoral work with the Division in 1972-1974 before going to the University of Papua New Guinea to lecture in biochemistry. She returned to Plant Industry in 1976, where she has worked ever since.

Dr Neville Fletcher

Dr Fletcher is currently Director of the Institute of Physical Sciences. He is a Fellow of the Academy of Science, the Institute of Physics, London, the Australian Institute of Physics, the Acoustical Society of America and the Australian Acoustical Society. Until joining CSIRO in 1983 as Institute Director, he was Professor of Physics (personal chair) at the University of New England. He has a distinguished record of research in solid-state physics, atmospheric physics and acoustics, and has published two books — *The Physics of Rainclouds* and *The Chemical Physics of Ice*.

Dr John Vercoe

Dr Vercoe is assistant Chief of the Division of Tropical Animal Science and OIC of the Tropical Cattle Research Centre at Rockhampton. He started his career with CSIRO in 1964, studying the reasons for differences in productivity between zebu breeds imported to Australia in the 1950s and the predominant British breeds. His work in this area, with colleague Dr John Frisch, now forms the basis for new and less empirical approaches to the selection and crossbreeding of cattle for improved productivity of cattle in the tropics. Dr Vercoe had two stints with the International Atomic Energy Agency in Vienna where he was head of the animal production and health section in the joint FAO/IAEA division.

SIROCREDIT

A CHRISTMAS BONUS

It's not in the Terms and Conditions but....

In the season of goodwill and cheer SIROCREDIT is happy to announce its limited Term Investment Offer available until 4.00 pm on Christmas Eve. The investment offer represents an opportunity for CSIRO staff and their families to secure an above market return for their deposits guaranteed for a period of your choice. Loan rates have also been reduced. A bonus for all members to enjoy. But act now!

Details of the offer are as follows:

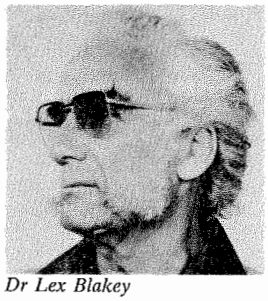
Minimum Deposit:	$1000
Term of Investment:	Your choice up to 24 months
Interest Rate:	Guaranteed for Term:
	3 mths: 11.5%
	6 mths: 11.75%
	12 mths: 12%
	13-24 mths: 12.25%

As we are all aware, financial matters have not been off the front pages since the stock market collapse, and increasingly it has become apparent that investors are now seeking a secure form of investment for a guaranteed return. This demand for fixed interest accounts is the basis behind SIROCREDIT's Christmas bonus offer and our normal policy of providing 'top of the market returns' whenever possible.

The board and staff of SIROCREDIT would like to wish all our members throughout CSIRO a very safe and happy Christmas and New Year.

Lex Blakey retires

One of the most widely known figures in the Australian building and construction industry, Dr Lex Blakey, Chief of the Division of Building Research, has retired after 36 years with CSIRO.



Dr Lex Blakey

Dr Blakey graduated in engineering at the University of Western Australia, and obtained his PhD at Cambridge in England.

Most of his working life has been spent with the Division. He joined the Organisation in 1949 as head of the structures and concrete technology group, and in 1968 was appointed assistant Chief. In 1974 he was seconded to the Department of Housing and Construction for two years as first assistant secretary — building technology and sociology.

In 1978, two years after his return to the Division, he was appointed Chief.

His belief in the need for strong communication between scientists and industry saw him on many committees and a regular speaker at hundreds of industry meetings in Australia and overseas.

High on the list of his many vital contributions to the Australian building and construction industry would be his fostering of many Australian standards through participation in a number of Standards Association of Australia committees, and the establishment of the Australian Building Systems Appraisal Council (ABSAC).

This latter achievement has enabled many significant building innovations to receive ready acceptance by building authorities and industry.

Scientist gives his time for the community

CSIRO scientist Trevor Gilbert has a very proud wife. Mrs Angela Gilbert wrote to *CoResearch* recently to draw attention to her husband's work with the NSW State Emergency Service.

She said although scientists may not be 'shouting from the rooftops' about their work, they were certainly not the wimps described by Barry Jones. Mrs Gilbert said her husband was a 'quiet achiever' in both his scientific and rescue work.

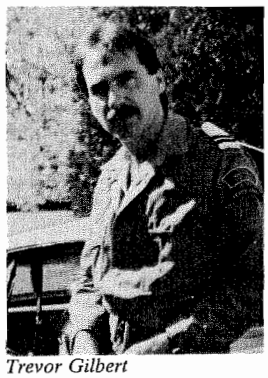
Mr Gilbert is an organic geochemist with the Division of Mineral Physics and Mineralogy (involved with oil exploration research), and is also a volunteer with the SES.

'In recognition for his service to the community during times of floods, and during rescues and bush searches, he has been promoted to the position of executive officer of the Sydney Northern Division, in charge of operations and intelligence, said Mrs Gilbert.

'This division co-ordinates locally based rescue squads for over one million residents in the northern districts of Sydney, during disasters and storms. It's all voluntary and often means all-night work.'

Mr Gilbert is also a member of the Botany Bay SES committee and the toxic and hazardous chemicals committee of the Total Environment Centre. He lectures at a number of universities in organic geochemistry and environmental science, and has also published some 40 scientific papers in the past eight years.

CoResearch would be interested to hear more about staff activities, whether related to or outside work. Please write to the editor (the address is on this page).



Trevor Gilbert

***CoResearch* is produced by the Public Communication Unit for CSIRO staff. Readers are invited to contribute or offer suggestions for articles. The deadline is the last Monday before the issue month. Editor: Liz Tynan, PO Box 225, Dickson ACT 2602. PH: 48 4479.**

The CSIRO women's netball team has won the grand final in blue division of the South Canberra Netball Association's summer competition.

This is the first year that the team has played together in competition and many of the women haven't played netball since primary school.

The team included: Leanne Newton, Linda Jackson, Katrina McQuillan (personnel HQ), Sari McGee (Institute of Physical Sciences), Christine Jones (RAO Canberra), Tess Mathews (Wildlife & Rangelands Research), Tonia Barnes (finance & admin HQ), Louise Raisin (Dept of Social Services) and Robyn Ronai (media group HQ).

The team was presented with trophies and they plan to play in the same competition next year.

McLennan awards

Cont. from p.1

production of high-purity ceramic grade zirconia powders and zirconium chemicals from zircon, derived from Australian beach sand.

The McLennan award seeks to stimulate, encourage and recognise outstanding contributions by CSIRO scientists to Australian industry. It was established by the former CSIRO Advisory Council under its Chairman, Sir Peter Derham.

It is named in honour of Sir Ian McLennan, a member of the Advisory Council from 1979 to 1981, recognising his contributions to the application of science and technology in Australia's industrial development.

Corporate identity

from p.1

the success of the symbol depends on a speedy implementation.

'You can argue for ever over a piece of artwork,' he said.

'Some people will love it; some will hate it. But most of us will accept it for what it is — a graphic device which acts as a unifying symbol for a diverse organisation.'

'The sooner the symbol is presented to the outside world in as many ways as possible, the sooner we will reap the benefits.'

Certain products are to be prepared immediately — letterhead paper, compliments slips, business cards — and will be processed by the Bureau and printed by the CSIRO printing centre. Divisions and institutes have already been asked to indicate their requirements.

The appearance of the corporate symbol on signs, cars, forms and published material will be gradually phased in over the next year. Bromides of the artwork will be made available to divisions with the implementation manual.