coresearch

For circulation among members of CSIRO staff

January 1973

166

BRITANNICA AWARDS

Late last year the 1972 Encyclopaedia Britannica Australia awards were made and in part shared by two members of the Division of Textile Industry.

Messrs David Henshaw and Gordon Walls of the Division shared the $10,000 prize for science with a member of the staff of Repco Ltd for their work in developing self-twist spinning machinery.

The self-twist spinner, now in full-scale production both in Australia and the UK, was a major advance in the technology of spinning fibres. Basically the machinery means that there is now a new method of imparting high speed twisting of multi-strand yarns. Previously this was responsible for nearly half of the cost of yarn production.

Each man received $3,333.34, plus a gold medallion and a citation from the Chairman of the Myer Emporium, Mr Kenneth Myer.

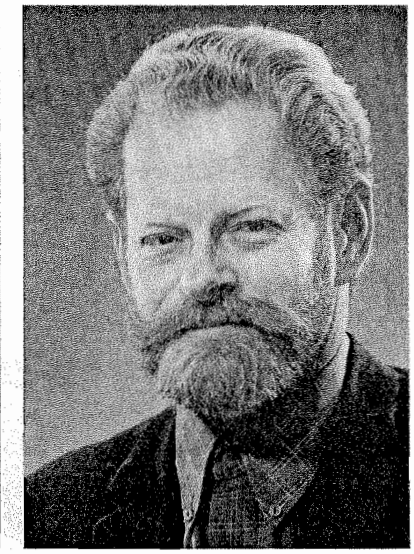
Mr Walls said that they are now working on the next stage of development: "By combining wool with synthetics you can get lightweight yarns, usable directly from the machine."

To do this a technique of using a lightweight continuous synthetic filament is used to reduce the strand weight by nearly half although the fibre is still 90% wool.

Repco have made nearly 350 of the machines, whilst the British company, Platt International, have made nearly 100.

Both Mr Walls and Mr Henshaw said they had no special plans for their prizemoney, apart from using it to pay off some bills.

Mr G. W. Walls



Mr D. E. Henshaw

Parkes and Apollo

The Parkes radio telescope was used in the Apollo 17 moon mission in December. As in previous Apollo missions, the large 210 feet diameter dish played an important part, particularly during the critical stages of the moon walk.

The prime role played by the telescope was on 12th and 13th December. During each of those days the Parkes team monitored and relayed signals from the moon's surface for about eight hours.

The signals included the TV and audio communications plus the vital telemetry and biomedical data.

After being received at Parkes, the signals were relayed to Honeysuckle Creek Tracking Station (in the ACT), then to the Overseas Telecommunications Centre in Paddington (Sydney), from there to the Moree ground station facility of OTC (in north-western New South Wales), up to a satellite and finally to the Apollo control headquarters in Houston, Texas.

As well as transmitting the incoming data it was all recorded on magnetic tape in case anything should go wrong in the transmission network.

Mr. John Bolton, who led the previous teams involved in the moon landing missions, again took charge of the CSIRO group.

Besides the staff of the Division of Radiophysics, there were personnel from the PMG, AWA and NASA taking part at Parkes.

Coresearch spoke to Mr Reg Stevens of the Division of Radiophysics during the first moon-walk, he said: "The most interesting difference on this mission is that a colour TV set has been installed at the telescope and, unlike the rest of Australia, we are able to see the pictures as they are transmitted. But there is really not very much difference between colour and black and white as the moon is mostly a dull grey-green and the only outstanding colour is the shoulder flashes on the astronauts' space suits."

Desert Balloon Found

Bob Millington, of the Rangelands Research Unit in Alice Springs, recently featured in the successful recovery of a valuable research balloon lost in the difficult Simpson's Desert country south-east of Alice Springs.

The search began on a Saturday morning late in November when Professor Victor Hopper, of Melbourne University and the RAAF Academy, rang up the Officer-in-Charge of the RRU at Alice Springs, Dr Max Ross.

After a quick discussion Bob Millington, Professor Hopper and his technical assistant set off in a light aircraft to try and locate the balloon and an access track into the desert to recover it.

The balloon was launched from Longreach, Queensland, the first of three 30 million cubic feet helium gas balloons, carrying instruments to high altitudes to look at stars emitting gamma rays and, in conjunction with CSIRO, pulsars in the southern sky.

The project is being carried out by Melbourne University in collaboration with a team from Case Western Reserve University in Cleveland, Ohio, led by Professor G. Fry.

Professor Hopper said after the balloon was launched it reached 154,000 ft and drifted towards the Gulf of Carpentaria as planned.

However, it changed direction and lost height, drifting towards Boulia in far western Queensland.

He said: "We decided to cut it down, but the command system failed. We knew it would come down on the automatic cut-down set for that day.

"We chased the balloon in a plane and it cut down as planned, the parachute dropping the payload of instruments well inside the Simpson Desert."

After the reconnoitre flight had been carried out on the Saturday, the following day was spent on a thorough study of maps and aerial photos of the area.

On the following Tuesday a party consisting of Bob Millington, Professor Hopper and his assistant, plus Tim McKnight and Selwin McIntyre from the Lands Branch of the Northern Territory Administration, left Alice Springs for the desert.

That night, after discussions with the owner of Numery Station, the party camped south-east of Alice Springs at Junction Bore.

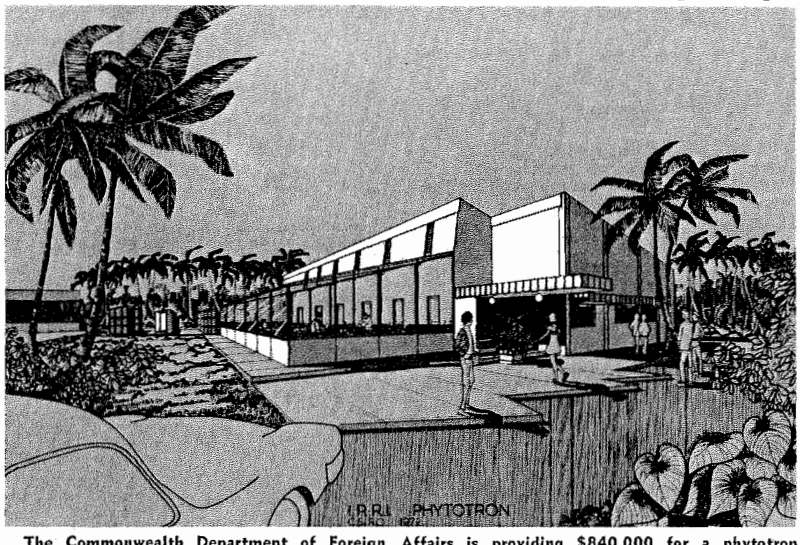
On Wednesday they started off into the desert but experienced great difficulty in picking which line of sand dunes to follow as the aerial photographs they were working off were over ten years old and a number of the features, particularly the vegetation, had changed in the years.

On the Thursday just before sundown, after positively identifying where they were at midday, they sighted the balloon payload.

Tim McKnight takes up the story: "Friday morning, after dismantling and loading the instrument package, parachute and other equipment, the return trip was started.

"Due to the following wind and the partly blocked radiator, the Lands Branch Toyota started boiling, necessitating

Cont'd P.4



The Commonwealth Department of Foreign Affairs is providing $840,000 for a phytotron (controlled environment plant laboratory) now under construction for the International Rice Research Institute at Los Banos in the Philippines. The phytotron will be used by scientists working on second generation problems of the 'green revolution'.

The preliminary design for the phytotron, which incorporates 26 growth cabinets, 5 controlled temperature dark rooms, and 6 air-conditioned glasshouses, was prepared by the Head Office Building Section following a visit to the Phillppines by Dr Lloyd Evans, Chief of the Division of Plant Industry, and Mr Bruce Gibbs of the Building Section.

Too Many Ph.D's?

Dr Clive West, Senior Research Fellow in Experimental Pathology at the John Curtin School of Medical Research, has recently carried out a study of the supply and demand for Ph.D. graduates in Australia. In this interview he talks to Max Bourke.

Max Bourke: You paint a pretty gloomy picture of erratic supply and erratic demand.

Clive West: Yes, I think that in some way we should try and iron out these fluctuations in supply and demand and by this I don't mean that we should have rigid controls such as you get in a planned economy such as Russia, but some method of regulating this supply and demand with some self-regulatory mechanism so as to bring the supply and demand more into balance.

M.B.: For those people who haven't read your articles in 'Search', could you briefly recapitulate the position with chemistry Ph.D.'s which is one of the most erratic recent ones?

C.W.: Yes, Dr Middleton, who was the Chairman of the Chemists' Employment Sub-Committee of the Victorian Branch of the Royal Australian Chemical Institute wrote—well, he and his committee wrote — an article on the proceedings of the Royal Australian Chemical Institute in 1971 and they showed that the projected graduations of chemists would go in 1970 from 107 to 1971 203, 151 (1972) 144 (1973) and 86 (1974). The expected vacancies over the same period would gradually increase from 86 to 103 then with a fluctuation 97 (1972), 128 (1973) and 116 (1974) and what this would result in, although in 1971 there may be quite a large surplus, by the time you get to 1974 there is probably going to be a deficit.

M.B.: Didn't you feel also yourself that the publication of these figures produced a drastic decline in the number of people actually enrolling to do Ph.D.'s?

C.W.: Yes, that's right, the projected graduations in 1974 have fallen to 86 — this is compared with their prediction in 1971 of 203 — so there has been a marked fall-off in . . .

M.B.: So, you think that people actually read these figures and that just simply deterred them from doing chemistry Ph.D.?

C.W.: Yes, for example in the Research School of Chemistry at the Australian National University they found it more difficult to get good Ph.D. students.

M.B.: In the study of the supply and demand of Ph.D.'s you don't make much comment about the role of CSIRO as a sink for Ph.D. employment.

C.W.: Well, the Middleton Report does go into the demand of the various sectors and it seems that CSIRO does not have, or doesn't foresee, a great demand for chemists. There'll be a few new opportunities and, of course, the usual losses due to attrition and death, retirement, transfers, and other people looking for jobs but the total numbers in CSIRO are not going to increase in the next five years like they have over the previous ten.

M.B.: Do you think the situation with chemists applies to other fields, say in the biological sciences and physical sciences as well?

C.W.: Yes, I think that the chemists are probably ahead of the other scientific disciplines; for example, there has been a tremendous interest in biology, especially in the molecular level, over the last couple of years and, although these people can find jobs now, in several years' time there may be quite a large surplus of people.

There was a report last year published by the University of Sydney Appointments Board. They conducted an opinion-type survey of the major employers for graduates throughout Australia with the emphasis on the employers in New South Wales.

The employers were asked to indicate, from their experience in recruiting graduates, the supply/demand situation for graduates in the Ph.D. degree and one year's work experience.

The results of the survey indicated that supply exceeded demand in chemistry, physics, biology and biochemistry.

Dr Clive West

So, it would seem that in physics, biology and biochemistry the situation may be almost as bad as chemistry, but I have a feeling that in biology and biochemistry the surplus will come about several years after that of chemistry.

M.B.: In your two articles in 'Search', you argue that industry should be somehow or other encouraged to take up Ph.D.'s in particularly, say, chemistry and physical sciences. How would this work in the biological sciences? There aren't many industries in Australia geared to handle people with Ph.D. expertise in biology.

C.W.: Well, two things to remember here. Firstly, people can be involved, or Ph.D.'s can be involved, in industry in several ways and I think that what you're referring to is research and development opportunities in Australia. Certainly in biology these positions are probably not all that great in number.

But I think that there are other fields in industry where Ph.D.'s can find employment and although the research and development laboratory may be an important bridge across which the highly skilled manpower can cross into these fields of employment, a lot of these people will end up as sales and management and marketing personnel.

M.B.: You imply, though, that Ph.D.'s probably aren't likely to want to get their hands dirty or their minds dirty in this kind of work as, say, salesmen or managers once they've got their Ph.D. ticket?

C.W.: Yes, but this is mainly because there have been no programmes designed to get people into industry and I think that this is what we want to achieve. Industry should have the benefit of a lot of this highly skilled manpower. We should design schemes to encourage people to go into industry.

M.B.: But you also imply something that approaches a plot, if you like, between university people and their students to encourage the best students to stay on and do Ph.D.'s with the ultimate role of a life in academia rather than mixing out there in the factories or workshops.

C.W.: Yes, that's true and I think this situation has come about because of the expansion period of the universities. The university people try to get the best students to stay on and to do a higher degree and then these people found it easy to get jobs in the universities because there are many universities being established and the older universities are expanding and the whole philosophy of the approach was designed to increase the academic employment of people in the academic world.

M.B.: Have academics now realized that the situation has changed, do you think?

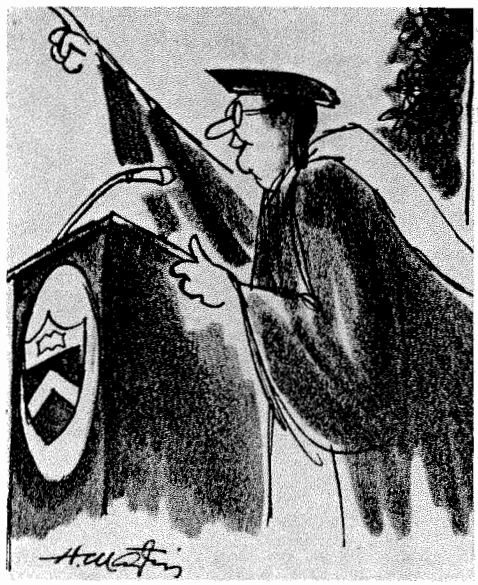
C.W.: Some have.

M.B.: You suggest planning and ways of getting them into industry. How do you actually see these plans being implemented?

C.W.: Several ways. Firstly, the government needs to have some overall economic planning, including a policy for science. There is no point in having a manpower policy in isolation.

M.B.: But a government science policy seems to be on the verge of being formulated anyway with the appointment of the Advisory Committee on Science and Technology.

C.W.: Yes, that is true but even so this Science and Technology Committee can't work in a complete vacuum but must be working as part of a framework, an overall economic plan. I don't mean rigid but just a statement of goals and aspirations of the country and of where the government sees that Australia will be in ten years' time, or various periods of time from now.



"As you leave these cloistered walls and ivied halls with your hard-earned Ph.D., we, your teachers and mentors, charge you: Be good waiters, courteous cabbies, and honest cops."

Courtesy 'Saturday Review'.

Cronulla at Work

When Coresearch visited the Division of Fisheries and Oceanography last month the problem became one of 'where to start', for the place seemed a hive of frenetic activity. Not only is the advent of ocean-going vessels proving a focus of planning activity, but several research developments were of interest.

The Division, as reported last month, is planning on first chartering and later building a large ocean-going vessel.

While this is going on the commissioning and first experimental work with a unique new facility, is under way. It is called a 'planktostat' and in appearance resembles a 'Heath-Robinson' fantasy based on a collection of gold-fish tanks.

As Mr David Tranter, the ecologist working on the plankton project, puts it: "The problem with plankton is that the subject of research keeps moving and is almost impossible to follow easily in its natural state. Unlike the scientists working on, say a convenient woodland, we don't know where our system under study will be from day to day."

Mr Tranter went on to say that there are only really two ways of studying the ecology of plankton in anything like their normal state. These involve tagging a known mass of plankton and following it around, or building some means of growing plankton which approximates the field situation.

Without a large ocean-going vessel it has not been possible to carry out the former technique although this should change in the not-too-distant future with the acquisition of such a ship. This will make it possible to locate a mass of plankton, known as a bloom, and to follow it for days at a time as it drifts with the current.

Ms Lynette Maddalena testing the pH in one of the tanks of the Planktostat. Each tank can hold 50 litres and the water is constantly agitated by perspex paddles driven by the long horizontal bar over the tanks.

In the meantime the development of the planktostat means that laboratory studies can be undertaken. It is essentially a number of tanks through which water passes and although there is a continuous turnover a natural ecosystem remains behind available for study.

The first part of the planktostat consists of water intake apparatus which collects sea water from Gunnamatta Bay, right outside the laboratory window, and purifies it by removing any native organisms. It can also add nutrients in prescribed amounts.

The prepared sea water is then pumped into the series of glass tanks. The water flows in the first tank and along the chain gradually being replaced. A large overhead shaft continually stirs each tank and provides motion in the water similar to that in ocean currents.

When a particular type of plankton or other organism is to be studied it is simply introduced as a culture into the first of the tanks. Of course, animals are lost out of the system, but this provides a situation like the real one where the population is in a dynamic state.

Cont'd P.4

Letters to the Editor

"Dear Sir,

"In Issue No. 164 of Coresearch you published an article on housing finance. The article opens, 'The AMP Society has a special housing finance scheme for CSIRO officers', then proceeds to outline what loan arrangements can be made. However, the article fails to note some important limitations to AMP financing and its link to insurance policy sales. These limitations are illustrated by experiences of myself and another CSIRO colleague.

"Shortly after joining CSIRO in 1963 I was approached by an AMP representative, who persuaded me to buy life insurance from the AMP. The representative's main argument was the preferential treatment given, after two years of policy-holding, to CSIRO officers needing housing finance. This argument got me in. Subsequently, the representative encouraged me on several occasions to approach AMP for housing finance when I should need it. Further, a second AMP representative phoned me at regular intervals, over some seven years, asking if I needed finance and pressing me to approach AMP.

"The need arose in mid 1971. I asked for finance at the AMP Sydney office, and straight away was told that funds had run out, loan money being generally hard to find at that time. I expressed regret that the optimism of AMP representatives was not fulfilled, and said that my main reason for buying AMP insurance was its strong link to the availability of housing finance. Then came the 'official' line that AMP representatives are in no way empowered to use explicit, or implied, promises of housing finance to encourage purchase of life insurance policies.

"The experience of my colleague was different. In mid 1972 he was not eligible for an AMP loan as he was (and is) single. Does AMP propose to continue this 'married only' policy, and what would be their attitude to single, female, officers who wanted housing finance?

"A final point, AMP levy interest at 8% on loans in the $8,000 to $16,000 range. This interest is the practical rate charged by building societies on their loans, including sums greater than $16,000.

"Yours faithfully,

"I. W. Smith, Minerals Research Laboratories, North Ryde.

"cc Mr R. W. Viney
Dr. A. McKenzie,
CSIRO OA."

Mr Ray Viney replied:

"Dear Mr Smith,

"Thank you for sending me a copy of your letter to the Editor of Coresearch regarding the AMP housing finance scheme.

"You are quite correct in saying that the AMP scheme has limitations. I am conscious of this fact, and regard it as just another source of housing finance available to the staff of CSIRO. The rates of interest are usually higher than those charged by banks and some other financial institutions, and the compulsory life insurance cover is, of course, an extra financial burden. The rates of interest and the applicant's obligation concerning life insurance were both clearly stated in the Coresearch article.

"Notwithstanding these disadvantages, the facility has been most valuable to applicants who have been unable to raise more than $8,000 from other sources. This is illustrated by the fact that 124 officers of CSIRO have received housing loans from the AMP Society since the inception of the scheme in 1956. It is true that the Society does have a quarterly or half-yearly allocation for housing finance, and there have been occasions when a CSIRO employee has had to wait a month or two until the new allocation became available. However, I have never had an application by a CSIRO officer rejected solely on the grounds that the Society's housing allocation for a given period had been exhausted.

"Had you written to me about your particular case in 1971, I may have been able to help you as my dealings with officers of the Society are usually at a higher level than the insurance salesmen. On a number of occasions concessions have been obtained for CSIRO officers by presenting all the facts and reminding the Society that the original intention was to place our officers in a more advantageous position than normal clients.

"You will realize that CSIRO is not in a position to influence the Society's internal policy on housing finance. At the present time, their policy is to give preference to married people, and whilst there are heavy demands from the general public for the available housing funds, this means that single people usually miss out. I have no doubt that if housing funds became more readily available from banks and other lending authorities, then the AMP Society would be pleased to provide funds for single people.

"As mentioned previously, the limitations of the AMP scheme are recognized. The purpose of the Coresearch article was to bring to the notice of CSIRO people this source of housing finance, in case it was of any benefit to applicants who could not obtain finance on satisfactory terms from other lending authorities.

"Yours sincerely,

"R. W. Viney,

Finance Manager."

"Dear Sir,

"My colleagues and I were discussing a well-known Melbourne Club at afternoon tea recently, and the question of 'old school ties' cropped up, and the suggestion was made that should not CSIRO like other superior organizations have a staff tie?

"Our colleagues at the Protein Chemistry and Wool Textile Industries Laboratories could perhaps help, and a competition could be mounted for a suitable style or motif. Different colours perhaps for 10, 15 and 20 years' service and so on with some several thousand members, a good half at least wearing ties, would probably make the number required sufficient for economic manufacture. Sale and distribution could be effected through Social Clubs.

"I am sure I, and my colleagues, though only minor cogs in a large wheel, are only too proud to be identified with CSIRO.

"Yours faithfully,

'Tied Up',

Printing Unit

(Name and address supplied.)

Farewell to Chris

After serving for thirteen years on the Executive, and working for the Organization since 1933, Mr C. S. Christian has retired.

Mr Christian graduated from the University of Queensland in 1929 and received an M.S. from the University of Minnesota in 1933. He then joined the CSIR Division of Plant Industry as a plant breeder and geneticist.

His early work with the Division was concerned with the study of the genetics and yield in wheat. When wheat markets fell and CSIRO was discouraged from doing further wheat research, Mr Christian turned to the development of pasture plants suitable for use in Queensland. This work stimulated his interest in utilization, for agricultural purposes, of the tropical and sub-tropical areas of Australia.

In 1946, when the problem of the development of northern Australia was being examined by the government, the Division was called upon to undertake land-use surveys of particular regions of this area. Mr Christian was appointed as leader of a special unit to carry out this work. The unit subsequently became a CSIRO section and in 1957 became the Division of Land Research with Mr. Christian as its first Chief.

Since the first survey in 1946, some 845,000 square miles of northern Australia and Papua New Guinea have been surveyed. Early in this work it became apparent to Mr Christian that it was necessary to study the areas involved as a complex of geology, topography, soils, vegetation and climate.

His development of the concept of land units and land systems has enabled surveys of large complex regions to be carried out relatively quickly, yet in a fundamental and searching manner. This approach has been adopted by FAO and UNESCO and by the Department of Technical Co-operation in the United Kingdom.

Mr Christian has been personally involved in a number of overseas aid projects, but probably the one he has been closest to was the establishment of the Arid Zone Research Institute at Jodhpur in India. Following his work there he has become known affectionately as the 'father of arid zone research'.

Mr. Christian has been on numerous important committees and received many awards including the Farrer Memorial Medal, the Australian Medal of Agricultural Science and is a Fellow of both the Australian Institute of Agricultural Science and the World Academy of Art and Science.

Mr Christian

When delivering the Farrer Memorial oration at Sydney University some years ago, Mr Christian said: "Conservation means more than mere preservation. Rational utilization of resources is the keynote to modern conservation concepts . . . The ultimate objective in the rational use of land . . . is to have different land types used for the purposes to which they are best adapted and most properly allocated . . . to preserve adequate samples of the inherited natural biological capital of the nation."

It is significant that this philosophy, which in the last few years has come to be widely accepted by ecologists and conservationists, has been the basis of Mr Christian's work for more than a quarter of a century.

For a man who has led such an active life retirement does not mean stopping work. Mr Christian has been approached by several companies, governments and overseas organizations as an adviser on environmental management.

As a councillor of the Australian Conservation Foundation, Mr Christian has been actively involved in the 'official' conservation movement.

Of the future Mr Christian said that the changing role of CSIRO was one thing to be watched. In the past the Organization had largely developed because the universities and the State and other Federal bodies had neglected research; this is no longer true. CSIRO will have to come to terms with its place in the more complex group of competing research organizations. He said: "The major question is, 'Just what CSIRO's future in this complex should be'."

Mr Christian went on: "CSIRO has managerial expertise for large projects and the conduct of a broad range of research. It also has the potential for much broader interdisciplinary research than these other groups. It would seem to me to be a mistake if, because of the developing interests of these other organizations in the use of science, CSIRO's research responsibilities were eroded."

Mr. Christian will be missed in the Organization not only for his major contributions to its scientific and managerial expertise, but also for some of the stories about him which have grown up.

For instance, he has an extensive reputation of being a tinker and builder of all manner of gadgetry from refrigerators to trucks to five-storey holiday homes.

In August 1946 the above photo was taken on the first Regional Survey Expedition into the Northern Territory. It shows Chris Christian (in the pith helmet), Alan Stewart (in the army hat) who is now Chief of the Division of Land Research, and the expedition's mechanic/driver, Roy Greenwood, taken near the Daly River, 100 miles south of Darwin.

COUNSELLOR

Dr E. G. Bowen, former Chief of the Division of Radiophysics, has been appointed Counsellor (Scientific) to the Australian Embassy in Washington, D.C.

Dr. Bowen, who is expected to take up his post in March 1973, will replace **Prof. H. C. Webster** who retires next month.

For the intervening period, the Office of the Counsellor (Scientific) will be headed by **Mr W. Hartley,** who has occupied the post on two previous occasions.

VISITORS

Messrs Sutomo and Soekarno of the Indonesian Meteorological and Geo-Physical Institute will arrive in Melbourne on Monday 11th December, bringing with them the Indonesian National Pyrheliometer Standard for comparison with the regional standard held at the Division of Atmospheric Physics at Aspendale.

The Division, in addition to being the National Radiation Centre for Australia, is also the World Meteorological Organization's Radiation Centre for Region V. The Regional Radiation Centre is defined as a centre for international comparisons of radiation instruments within the region maintaining the necessary standard instruments for this purpose. Region V includes the countries in the South West Pacific Area.

RETIREMENTS

Mr Bert Gilliard has retired from the Division of Irrigation Research after 34 years of service with CSIRO.

Mr Gilliard, previously a highly skilled musician, became a member of the staff of the CSIRO Irrigation Research Section as Griffith in October 1938.

Initially, he was employed as a labourer on general farm duties. However, his organizational and technical abilities were soon apparent, and consequently were in great demand resulting in his eventually being classified as a Technical Officer.

Mr. Gilliard has worked on a number of research problems which have included irrigation and percolation studies, soil temperature measurement, and frost prevention. However, the major part of his time has been spent in research related to nutrition and soil management of citrus.

Mr E. L. Deacon of the Division of Atmospheric Physics retired on 1st December 1972. To mark the occasion a dinner was held at the Beaumaris Hotel and was attended by approximately 120 past and present members of the Division, together with wives and friends.

Mr Deacon joined the original Meteorological Physics Section as one of its foundation members in December 1947.

His main professional interest has always been in problems of the atmospheric boundary layer; he was one of the leading figures in establishing and implementing the Division's programme to measure the frictional stress of the wind against the earth's surface and the interchange of heat and water vapour between earth and atmosphere, and in extending this to shipboard measurements over the sea.

Cont'd from P.1

Desert Balloon

stops at approximately every half hour, for half an hour.

"As arrangements had been made on the morning radio schedule for the equipment and Professor Hopper and assistant to return to Longreach on Sunday's bus, and as there were five drivers for the two vehicles, it was decided to keep going after dark.

"When by distance covered we were north of the dunes, a compass course was set to intersect the outward track. This was accomplished at 2340. The Lands and Survey Toyota was boiling less frequently, probably due to the direction now being across wind and to the lower temperature, and we kept going to reach Alice Springs at 1020 on Saturday."

Professor Hopper said on his return to Alice Springs that he had alerted the RAAF before going into the desert, to prepare for a rescue operation.

He said: "I probably would have needed it if it had not been for the skill of these three men who know the country so well.

"The Simpson Desert has always been the great fear of balloonists, but this has proved that recoveries are possible at short notice from any part of Australia."

So, the successful recovery of the valuable instruments and their data was accomplished, but the story did not end there.

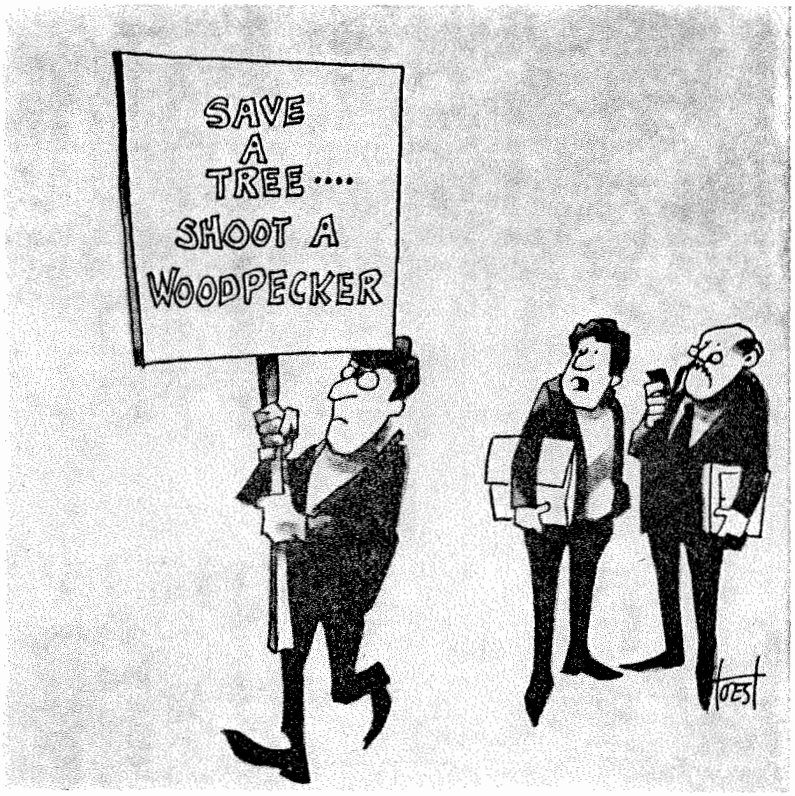
As Bob Millington takes up the story two weeks later: "At 10.00 p.m. Vic Hopper again rang me. He is in Alice Springs and has another payload to recover.

"This time the cut-down mechanism worked effectively and the recovery was from a point half a mile north of the Ayer's Rock Road, eight miles west of the Erldunda turn-off.

"This flight had used a gondola belonging to the American group and had been launched twelve hours before.

"Ian Tapley (also from the RRU) and myself were proposing a Hugh Valley instrument service trip so Rangelands provided another vehicle for Hopper's group and we accompanied them for this recovery returning to the Hugh sites in the afternoon."

Mr Gilliard (left) receives a presentation at his farewell from Dr P. R. Cary (right).



"Hadley has a lot more to learn about ecology."

Courtesy 'Saturday Review'.

Cont'd from P.2

CRONULLA

As Mr Tranter says: "The planktostat has a future beyond just a model of an estuary or upwelling, as it provides light, enrichment of nutrients and plankton, it represents a model of any ecosystem with all its varied components like energy turnover, predation and grazing."

Eventually a very large pool alongside the laboratory will be used to take these studies on to an advanced stage or scale.

Tuna Temperature

One of the happiest men at the Division of Fisheries and Oceanography was Mr Clarrie Brown.

The day before your Coresearch correspondent had arrived the south coast (NSW) fish canneries had declared a moratorium on fishing because so much tuna had been caught in the preceeding few days they could not process it.

A big part of the credit for the fantastic haul of tuna was credited to the information supplied by the sea temperature maps developed by the Division.

Investigations of the southern bluefin tuna schools have led to the discovery that the rippling schools, those which are caught most readily by the pole and bait method, congregate in areas where there is a temperature front, where cold water meets warmer water.

The Division pioneered the technique of using an infra-red radiation thermometer from an aircraft to chart the position of temperature fronts. The charts look like those on weather maps.

After a recording flight is made off the south coast Clarrie Brown sets off on a trip along the coast handing out the charts of possible locations to the skippers of the fishing boats operating out of the ports from Ulladulla to Eden near the Victorian border.

Partly as a result of the map issued on 2/11/72 fishermen had landed nearly 1,000 tons of tuna. At $240.00 per ton it is no wonder that they have promised Clarrie enough champagne to keep him in trouble for months.

During the research that led to the development of this work there was a tragic aircrash in South Australia that caused the loss of one of the researchers working on the programme. Clarrie Brown at the time had to swim for over three hours before rescue.

The technique being used today is not a sure-fire guarantee, but it does guide the fishermen and cuts down on the amount of wasted time spent searching for fish.

Master

Mr J. G. Zadow, of the Dairy Research Laboratory at Highett, has recently been awarded an M.Sc. by the University of Melbourne.

SAFETY NOTES

In The Swim

The summer, and for some of us daylight saving. A time for a relaxing evening dip in the backyard swimming pool. A luxury more possess now that large portable pools are available.

Chemical water treatment for these pools is essential. Unless the correct balance is maintained, you run the risk of the water becoming an ideal breeding ground for disease, or causing severe eye and skin irritation.

Regularly measuring the condition of the water with the type of test kit usually provided by the pool manufacturer is the safest way to decide what treatment is necessary, plus, of course, regular draining and cleaning.

Daylight is not an essential ingredient for an evening swim. Floodlight the pool and it can be used at any time.

Last season one enterprising person wired up his own temporary floodlight. It looked very neat. An extension cord with a **plug at each end** connecting a switched power point in the garage to a socket mounted in a box adjacent to the pool!

The very last time he used this hook-up he first switched off the power at the garage, which extinguished the light, and leaving the extension cord plugged into the power point, walked to the poolside and pulled out the plug at that end.

He was fatally electrocuted when he grasped the plug to coil up the cord. Another example of the switch being in the **neutral** line. His body connected the unswitched active to earth by way of the plug prong and the wet pool surround.

Please don't follow his example. And, by the way, enjoy your swim.

Gil Barnes, Safety Officer.

Printed by CSIRO, Melbourne

coresearch

For circulation among members of CSIRO staff

February 1973

167

TWO NEW CHIEFS NAMED

Mr J. Warner and Dr G. B. Tucker have been appointed Chiefs of the Divisions of Cloud Physics and Atmospheric Physics, respectively.

Mr Warner will take up his appointment immediately and Dr Tucker will take up his appointment in March.

As an engineer and physicist, Mr Warner was closely involved in the radar and cloud physics programmes carried out for many years by the Division of Radiophysics. He commenced work with the Radiophysics Laboratory in 1940 after graduating from Sydney University with First Class Honours, and later became leader of the Cloud Physics Section.

In 1970 Mr Warner spent six months studying convection in the atmosphere at the Desert Research Institute in Nevada, U.S.A.

Dr Tucker graduated from the University of Wales and then undertook a Ph. D. at London University. In 1954 he joined the research division of the U.K. Meteorological Office.

Dr Tucker came to Australia in 1965 when he was appointed Assistant Director of Research and Development at the Commonwealth Bureau of Meteorology in Melbourne, before becoming Officer-in-Charge of the Commonwealth Meteorology Research Centre in 1969.

His research has mainly been directed to developing sophisticated numerical models of the atmosphere as a means of gaining a deeper understanding of weather processes in the southern hemisphere.

In Australia Dr Tucker has served on National Committees on Antarctic Research, space research and the Global Atmospheric Research Programme (GARP). He is Chairman of the working group on numerical weather prediction of the Commission on Atmospheric Sciences of the Meteorology Office and is a member of the joint organizing committee of GARP.

MOVING MOUNTAINS

"Page 3 of the MRL Annual Report has a map showing the outstanding work being done by CSIRO in Western Australia. To help reduce mapping costs, W.A. has been rotated some 20° counter clockwise so that more areas of interest fit on standard rectangular maps. MRL and plate tectonics go hand in hand for progress."

Courtesy 'MINFO'

Volt Standard

A more accurate standard for the electrical unit, the volt, came into effect in Australia on the 1st January, 1973.

The new standard is based upon a phenomenon called the Josephson effect which allows the volt to be determined in terms of frequency.

Frequency has been adopted for this purpose because it can be measured far more accurately than any other physical quantity.

The measure of the volt as used in Australia has been based upon a group of standard cadmium cells at the National Standards Laboratory, Sydney.

Standard cells provide an accuracy to several parts per million. The new method will give approximately ten times greater accuracy.

More importantly, the new standard will ensure that the value of the Australian volt will no longer drift with time.

Sensitive instruments at the National Standards Laboratories and at some overseas laboratories have revealed a slight drift in the voltage of standard cells.

THE NEWS IN BRIEF

Visitors

Mr Edih Suwadji is visiting the Division of Soils as a Colombo Plan Fellow from Indonesia. He will spend nine months with the Division.

Mr Prak Ousarath from Cambodia who is a M.Sc. student with the University of Adelaide, is spending three months with the Division in the Mineralogy Section.

Redwood Table

The Forest Products Laboratory of the Division of Building Research recently had the pleasure of helping Lord and Lady Casey to obtain a beautiful coffee table made from one of their own redwood trees on their property at Berwick.

The tree had to be felled but it seemed a pity not to perpetuate its beauty in some article for daily use that would show the attractive grain of the redwood, which is one of the most sought-after decorative timbers.

One of the Division's retired master craftsmen, Mr Norman Lynch, constructed and beautifully finished a small coffee table, designed by Lady Casey, from the timber provided by Lord and Lady Casey.

It was presented by Mr Lynch and Dr Walter Kauman (Assistant Chief of the Division of Building Research) to Lord and Lady Casey.

Seconded

Mr Jim Davenport of the Division of Food Research has been seconded to the Reserve Bank of Australia for a period of three years. His new responsibility will be the administration of the Rural Credits Development Fund as well as general science liaison for the bank.

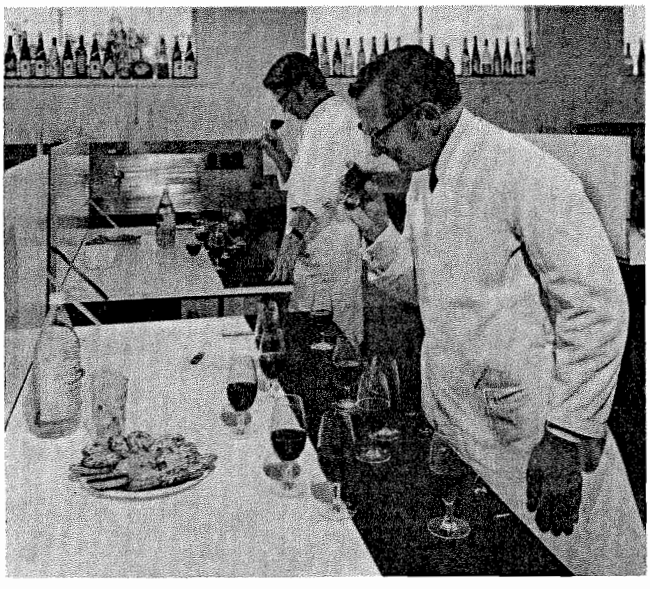
Mr Davenport will continue as Honorary Editor of 'Search'. He is also currently President of the Contemporary Art Society of Australia and a member of the New South Wales Branch Committee of that society.

Doctorate

Dr W. R. Blevin of the Division of Physics has been awarded the degree of Doctor of Science by the University of New England. Dr Blevin received his degree for the work he did in the field of precision radiometry and it is the first occasion on which an Australian university has conferred a senior doctorate for basic standards work.

Member

Dr Peter Claringbold, acting Chief of the Division of Computing Research, has been elected an honorary member of the International Statistical Institute.



The answer lies in the nose

And in the mouth too of course.

Research on mechanical harvesting of grapes, led by Dr Peter May, in the Division of Horticultural Research, does not end when the grapes are harvested.

At the Experimental Grape Quality Laboratory at Merbein expert winemakers assess the results of research on grape production in the area that it counts most, the mouth and nose.

Mr B. Tyson of McWilliams Wines (foreground) and Mr M. Tummel of Gramps, test wines made from the research programme's grapes.

In this particular experiment the quality of grapes from mechanical and hand harvesting, as affected by various post-harvesting techniques, was assessed.

Provided sulphur dioxide is added in the field, wines made from mechanically-harvested grapes are of a quality at least equal to that made from those harvested by hand.

". . . It's a fine naive domestic sludge without any breeding, but I think you'll be amused by its presumption."

— Apologies to James Thurber.

Luis Kolorik of the Division of Applied Chemistry appears somewhat dubious of the quality of the treated sewage effluent he is examining. Even Dr Don Weiss on the right, also of the Division, seems less than enthusiastic about the product. With them are two Senior Engineers from the Melbourne Metropolitan Board of Works.

The occasion was an inspection recently of the Division's new mobile laboratory. The caravan is outfitted to undertake water quality analysis. At present it is located near the pilot sewage treatment plant at Lower Plenty in Victoria.

WOMEN'S LAB.

Much ado is made about the 'liberation' of various places of work or activities for women. But it is probably not recognised that science had some women's libbers, in rhetoric at least equal to St. Germaine Greer, some 300 years ago.

Lewis S. Feuer in the 'Scientific Intellectual', wrote about the coffeehouses of England in the seventeenth century as the places of free thought and the new ideas circulating in the country, where the budding scientists held their meetings; he went on:

"Excluded from the coffeehouses, women, however, achieved in other places a new unwonted eminence. The hedonistic ethics that presided over the origins of modern science also promoted the entry of women into scientific life.

"Women's participation in scientific readings and pursuits became part of their social role in the salon. The Duchess of Newcastle early managed to get herself invited to a meeting of the Royal Society, at which she was shown sundry instruments and experiments.

In 1663, the Duchess indeed came out in favour of the education of women. Her argument was much the same as the one John Stuart Mill used two centuries later. Englishmen, she wrote, were in danger of becoming 'Irrational as Idiots . . . through the Careless Neglects and Despisements to the Female'; women, she added, were confined to idleness 'like Birds in Cages, to Hop up and down in Houses'. She had called on women the year previously to organize themselves 'that we may unite . . . to make our Selves as Free, Happy, and Famous as Men'. Her contemporaries called this femme savante Mad Madge. Nevertheless, her scientific writings for the female audience, the Observations Upon Experimental Philosophy and her scientific utopian romance, The Description of the New Blazing World, were infused with the emancipative spirit of the new movement.

Contd. P 3

"You males are all alike!"

Courtesy 'Punch'

CLOUD CHASERS

A strong stomach is one of the main requirements for the researchers in the Division of Cloud Physics, or particularly that group interested in turbulence.

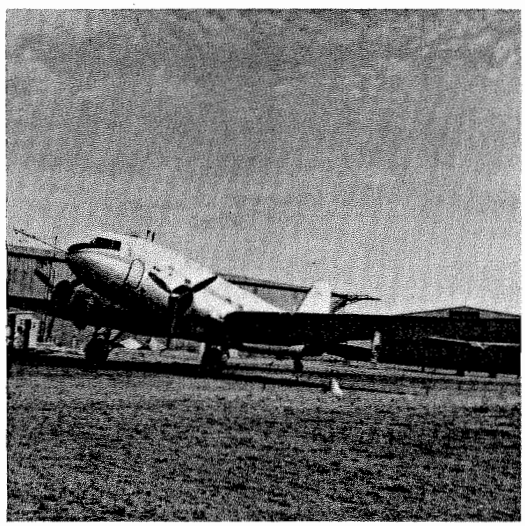
Recently 'Coresearch' went along on one of their expeditions in search of atmospheric turbulence near Deniliquin, and although your correspondent survived, only just, the number of green faces on landing seemed to indicate that there where several happy people when the door was opened back on the ground.

Led by the new Chief of the Division, Mr Jack Warner, the group spent several days based at Deniliquin airport looking at high frequency temperature fluctuations as an indicator of air mixing.

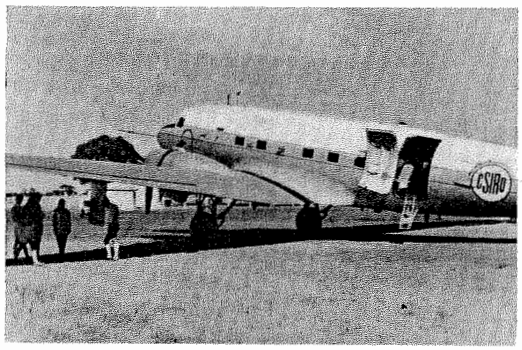
The Division uses a 28 year old DC 3 aircraft which was formerly used in a transport squadron by the RAAF. In fact Mr Ces Maher of the Division flew as navigator in this particular aircraft when it was stationed in Japan during the Korean War.

Romeo Romeo Alpha (or VH-RRA as it is more formally known) is in first-class condition for such an old plane as it has done very few hours and at present only flies about 200 hours per year.

Besides Mr Warner on this expedition were Ms Lorraine Pearce, Dr Chris Coulman and Messrs Trevor Newnham and Ron Cottis. Mr Warner described the purpose of the Deniliquin expedition:



"In Australia cumulus clouds are responsible for a significant fraction of our rainfall and the amount of rain that falls from an individual cloud in general increases as the cloud depth increases.



"One of the main factors limiting cloud growth is the fact that clouds mix with their clear air surroundings. The dry, relatively cooler, environmental air reduces the cloud water content and decreases buoyancy and updraft velocity as it mixes.

"The nature of the mixing process is not well understood and this lack of knowledge prevents us from constructing theoretical models of cloud behaviour and so predicting what would happen to natural clouds quite apart from those which are seeded. The way in which a clear air thermal (the precursor of a cumulus cloud) mixes with its environment is likely to resemble in many ways the mixing between a cloud and its surroundings though it will be a simpler process since evaporation and condensation are not involved. The expedition to Deniliquin is aimed at obtaining measurements relevant to the mixing of thermals with their surroundings.

"Very sensitive high powered radar sets obtain echoes from clear air thermals which in plan view appear as ring-shaped patterns of a kilometre or so in diameter. The radar 'sees' turbulent fluctuations in the refractive index of the air of scale half the wavelength of the radio frequency employed which is commonly 10 cm. The ring-shaped patterns are observed at the top of the thermals and not usually lower down and we think that they are an indication of the importance of the mixing process at the top as opposed to the sides. We are interested in making measurements of fluctuations on a scale of the order of 5 cm which at our aircraft flight speed of about 60 m.p.s. corresponds to a time scale of the order of 1 millisecound. Since we cannot make measurements of humidity fluctuations on this time scale we intend to make measurements of the temperature fluctuations and to make the observation in a hot, dry area where thermals should be frequent.

"Our procedure will be to fly at all levels from about 100 metres above the surface up to the top of the developing thermals measuring and recording the high frequency temperature fluctuations. We will also be using rather more slowly responding equipment which responds to scales of the order of 5—10 metres and greater to record temperature, humidity and vertical and horizontal air motion. The flights will be made in mid-morning since this is the period when the thermals are developing and when we are most likely to obtain observations relevant to our purpose.

"Instruments are mounted ahead of the nose of the DC 3 aircraft and under the wings — the information obtained from the instruments is recorded in the cabin both on chart recorders and on magnetic tape."

To carry out these measurements the plane is loaded heavily with instruments which include, besides a variety of recording apparatus, a PDP computer.

The plane is maintained and operated by East-West Airlines under a contract to CSIRO.

The DC3 is nearing the end of its useful lifetime for this research. In fact plans are under way to procure a new aircraft for this work. Although the DC3 can fulfil one of the principal requirements for cloud physics research, namely fly relatively slowly, it is too slow in its rate of climb to make quick contact with clouds that interest the scientists and it is rather overloaded when operating with its full load of instruments so that the range is reduced.

The Division is interested in acquiring a Fokker Friendship which it may hire or buy in the next few years. It will be a pity to see Romeo Romeo Alpha go as it has sentimental attachments for all those who have used it and all those who appreciate what a magnificent aeroplane the DC3 is.

Letters to the Editor

"Dear Sir,

"The Committee of the Division of Textile Industry's Social Club was most interested in the letter from 'Tied Up' (January Coresearch) suggesting a staff tie for CSIRO. We would be able to arrange for the manufacture and supply without any difficulty and would envisage that the selling price for an all-wool tie with suitable motif would be significantly less than $2.

"We are prepared to offer, as a prize for the best design, a sheepskin and suggest that Coresearch may be prepared to organize a competition and arrange judging. Presumably the chosen tie should be submitted to the Executive for approval, if it is to be identified with the Organization.

"Yours faithfully,
J. H. G. Watson,
Hon. Secretary."

"Dear Sir,

"Coresearch 166 provided yet another example of the male chauvinism prevailing in the CSIRO when it published the letter from Mr 'Tied Up' of the Printing Unit, advocating the production of 'old school ties' for CSIRO staff.

"Apart from the ostentatious vulgarity of the whole idea, Mr 'Tied Up' quite overlooks the dress requirements of the female members of staff.

"I did indeed once wear a school tie, in hideous black, purple and gold stripes, aggressively embroidered with some noble sentiment about my alleged virginity (in Latin, of course); but I rarely wear my gymslip now, nor other gear requiring a tie.

"Mr 'Tied Up' would have won more support, I feel, had he suggested as an alternative a neat heraldic device to be stitched on to my knickers.

"Yours faithfully,
(Ms) Doris M. E. Leadbetter."

"Sir,

"The letter in Coresearch 166, attributed to 'Tied Up', Printing Unit, is surely a classic example of the Public Servants' long inherited reputation of being a class above everyone else in the work-force.

"I have no doubt that sections of the Organization may well claim to be likened to 'other superior organizations', but for any member of the Printing Unit to suggest that a distinctive tie be worn to highlight one's association with the CSIRO, is clearly a case of the writer wishing to bask in the reflected glory of the more distinguished members of the Organization.

"Surely the Printing Unit can lay no claims to being a 'superior organization'? This is what the writer must suggest if he wishes to wear (with pride) the distinctive tie he proposes is designed!

"The days of the 'Old School Tie' are, thankfully, behind us, but for those who wish to carry on the tradition, by all means let them do so, but for their sakes (the traditionalists), remember that the pride of wearing such emblems is something that has to be earned and not something that is lowered in value to a degree where it could bear a 'Coles' label!

" 'Untied', Printing Unit.
(Name and address supplied.)

"P.S.—I may be doing the writer an injustice — the letter may have been in a humorous vein — I searched for the humour but it escaped me and therefore I concluded he was serious!"

"Dear Sir,
(Re 'Definition'
Coresearch 165.)

"Mixing your units as well as your drinks? 1 oz/7800 gal gin perhaps, but 1 fl oz/6250 gal.

"And while you're at it, speed of light = 1.7515×10^{12} f.f^{-1} (furlongs per fortnight).

"John Corbett, Animal Physiology, Armidale."

RRU AT DENI

Recently 'Coresearch' visited the Rangelands Research Unit Laboratory at Deniliquin. Work ranging from botanical and genetic studies of both native and introduced plants to the grazing management of sheep, cattle and goats is under way there.

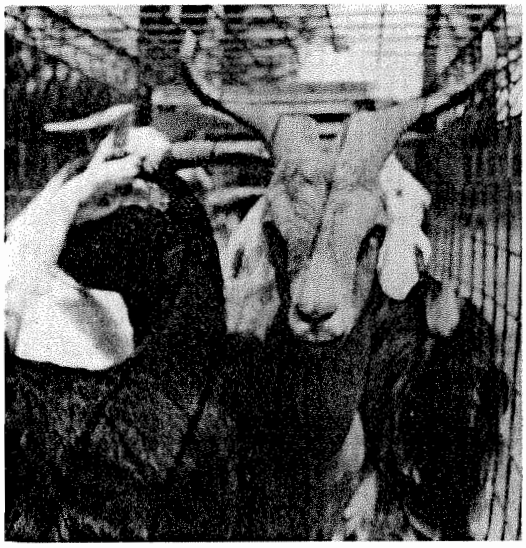
Jim Noble is interested, amongst other things, in a plant with a number of unusual characteristics. It is a native plant called Nitre Bush or Dillon Bush *(Nitraria billardieri)* and occurs over a wide area of arid and semi-arid country in southern Australia. Although in lightly grazed pastures, it is a rather insignificant species with grey-green leaves and a tough stem, when heavy grazing removes the competition or plenty of water is applied it grows into a magnificent plant up to 15 feet high and twenty to thirty feet in diameter.

Dillon Bush also occurs in Russia, North Africa and China. From studies of fossil pollen records, Russian scientists believe that this bush is part of an ancient biological link with the 'super-continent' of Gondwanaland.

One of the features of the bush that seem to indicate its survival from a long-gone climate is its peculiar winter deciduous habit. Dillon Bush loses its leaves for about six weeks in mid-winter around Deniliquin which is unusual in a winter rainfall area such as that part of the world now is.

Dillon Bush, which has both male and female plants, produces an attractive crop of either yellow or dark red berries. These have a salty/sweet taste when they are ripe and are very high in sodium chloride as are many plants of this area.

When Jim tried to germinate the hard seeds from the plant he met little success. After hearing from local graziers that emus were fond of the berries he then tried germinating seeds collected from emu droppings. This resulted in an amazing 70 per cent germination and points to an interesting relationship between bird and plant. At this time of the year the emus seem to spend a good deal of time eating Dillon Bush or rather its succulent fruit.



Goat Study

Allan Wilson, also of the Rangelands Laboratory at Deniliquin, was attending a conference when people started implicating goats in the formation of the desert regions of the world, apparently based on hearsay.

Allan has spent a number of years looking at the grazing habits of sheep and latterly of cattle in the semi-arid areas of the Riverina and thought that it would be profitable to look at the legendary eating prowess of goats, particularly the feral goats, of the arid zone.

In western New South Wales and northern South Australia there are very large populations of wild goats. These are occasionally harvested and used in either pet food or exported canned.

In certain areas of western New South Wales there has been large-scale regrowth of low scrub probably due to the removal of rabbits and the good years of the middle fifties. In fact this scrub growth has been so vigorous in some areas that it is blamed by graziers for reducing the carrying capacity of domestic stock to such a point that it is uneconomical to graze the area and they have walked off the properties.

Allan Wilson is interested in seeing if the wild goat population might be an effective way of coping with the regrowth problem and at the same time providing income from the goat meat.

As part of his research he is studying what pasture grasses and shrubs are eaten and preferred by goats. One of the stranger preferences that they seem to have is a marked predilection for mistletoe which they get by standing on their hind legs and browsing from the low trees.

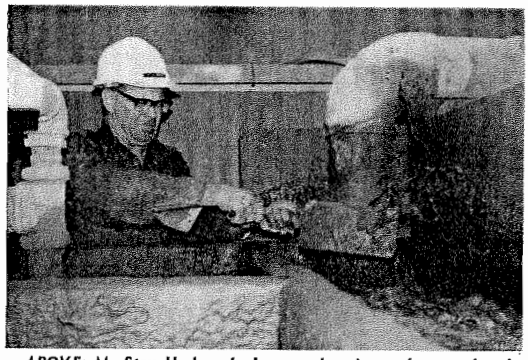
MUCKING-IN

Far from the ivory tower, these members of the Division of Chemical Engineering are taking the results of years of research on mathematical modelling, to examine the performance of a mill in practice.

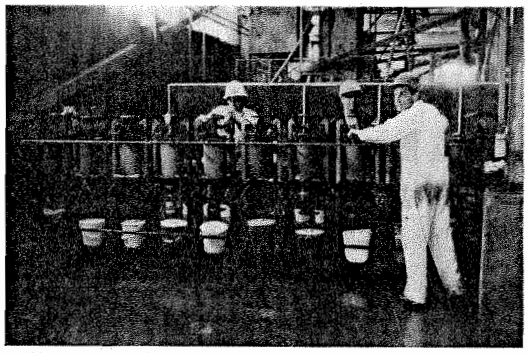
These shots were taken of Dr D. F. Kelsall's team of Diagnostic Metallurgists in action in the field at a tin processing plant.

This work entails an extremely thorough evaluation of mill performance to point up areas with potential for improvement.

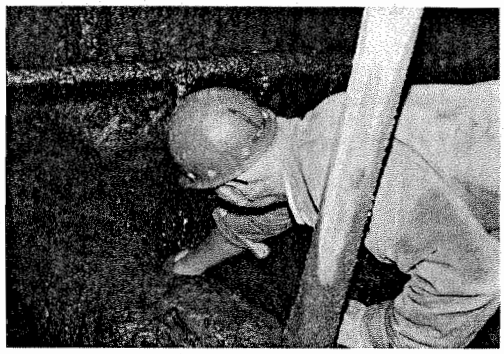
None of the operations pictured here are unusual in mineral processing plants, but careful accurate sampling of stream flows over an extended period of up to eight hours is the first step in the long series of operations to evaluate plant performance. Few mineral processing plants have sufficient staff available for such a long and detailed sampling programme so this work is performed, at least in part, by the Diagnostic team.



ABOVE: **Mr Stan Hudson looks apprehensive as he samples the full flow from a 6 inch line.**



ABOVE: **A bank of pressure filters is used. From left, Mr B. Povey (Renison Ltd), Mr Stan Hudson and Dr Phil Stewart of the Chemical Engineering team.**



ABOVE: **Dr D. F. "Kelly" Kelsall really mucks-in when sampling the final product from flotation cells which remove iron sulphides from a tin ore prior to further processing.**

A WRINKLY PROBLEM

Why do woollen garments wrinkle so easily compared to some other textiles, and how do they shed their wrinkle?

A difficult problem being worked on by some of the researchers of the Division of Textile Physics at Ryde in Sydney.

The research has shown a peculiar property of wool to be its ability to 'age' when left hanging for a period.

As part of the research programme Dr Bernie Chapman of the Division has been studying the performance of individual fibres to see how they react when bent, which is part of the process that goes to making up wrinkles in the finished fabric.

Using a remarkable technique of mounting a single wool or synthetic fibre in a closely fitting glass tube, the fibre is subjected to a bending load and the strains measured in both bending and in recovery.

This work has shown that the characteristics seen in woollen fabrics when they are wrinkled are closely related to the way in which the individual fibres behave when they are bent.

Woollen garments wrinkle much more easily shortly after wetting. As Dr Bill Denby, also working on this project, puts it: "Woollen clothing seems to have a remarkable ability to 'remember' the last time it was wet or pressed. If you get something back from the drycleaners, nicely pressed and pop it straight on, wrinkle it a bit and in five minutes you'll look like the wreck of the Hesperus. But leave it for about a week in your cupboard and you find that it doesn't wrinkle nearly as easily. Most housewives know this, I think."

"We've been doing similar work to Bernie Chapman, but using fabrics instead of single fibres and we find that as the single fibre properties change, the fabric properties change almost identically."

Speaking about the 'ageing' process, and the resistance to wrinkling this imparts, Dr Denby said: "The improvements you get depend on the conditions under which you do the wrinkling. One of the standard tests for wrinkling involves suddenly changing the temperature and humidity, for half an hour before you put the wrinkle in which makes it very much worse. On the other hand, that is something like what happens when you lean back in a chair when the temperature of the suit starts rising and a bit more moisture is present particularly if you are sitting in a vinyl chair which won't let the moisture through."

"The loss of ageing seems to be involved with sudden changes in temperature and humidity. This appears to be nothing more than a variant on the need to leave your clothes to age after drycleaning. As far as we know, the ageing process goes on for years. At Geelong (Division of Textile Industry) they have worked on the optimum conditions for a garment to age."

There are no solutions yet to the wrinkly problem, but at least they know why it happens.

WOMEN'S LAB.

Contd. from P 2

"The Duchess and her husband had shared the exile of Charles II in Holland, and employed those years to dabble in natural philosophy. The Duchess had meditated how a beautiful lady, as seen under a microscope, 'would not only have no Lovers, but be rather a Monster of Art . . .' She wrote poems concerning other worlds and distant stars, the compass and the microscope.

"The Duchess was not alone in her scientific and artistic activities. The decade of the 1650's saw these interests burgeoning in the bosoms of many distinguished ladies—Mrs Philips, Mary North, Dorothy Osborne, Margaret Blagge, Lady Pakington, the Countess of Warwick, and Mrs Hutchinson. No gloomy Calvinist matrons, they were Restoration women who restored science together with the life of the senses."

Animal, Mineral or Vegetable?

"Going through the old Editorial files at North Ryde, Jean Macklin and Jan Skeoch came up with this unusual ending to a Division of Mineral Chemistry letter several years ago: 'As arranged, I have pleasure in enclosing the abstract of the paper which Dr . . . . . is to present to the forthcoming conference of your Association. I also enclose brief biological details. Yours sincerely, I. E. Newnham, Chief of Division.'"

For SIROVILLA a SIROFAIR

The Division of Textile Industry Social Club was formed in 1962 and has always been active in raising money for charitable and benevolent purposes.

Up to 1970 some $4700 had been raised and disbursed in various ways and about that time some members of the Club suggested that the scale of funds was such as to make possible a specific project of some significance.

It was finally decided to sponsor an Elderly People's Homes Society, and at a public meeting on 21st February 1972 a Society, subsequently named SIROVILLA, was formed. The Division's Social Club is the mainspring of the Society and most members of the Division are enthusiastic supporters. In fact, there are already more than 20 'Life Governors'—a title indicating a donation of at least $40.

There has been great interest and good support throughout the Geelong district thereby enhancing the already good name of CSIRO in the area.

In less than 12 months, more than $2600 has been raised by the Society while the Social Club has over $5000 in hand. It is hoped that land can be purchased soon, preferably near the Division in order to encourage involvement of staff members.

Subject to certain conditions, a government subsidy is available and it is hoped to commence building within 12 months.

The Social Club is busy arranging a large fair (SIROFAIR) to be held in the grounds of the Division on Saturday, 3rd March, from 11.00 a.m. to 4.00 p.m.

With daylight saving it is an ideal opportunity for people from the Melbourne Divisions to have a day at the seaside and call in at the fair on the way for lunch and a bit of fun and to support SIROVILLA.

There will be food galore, all sorts of stalls, entertainment (pop bands, Wool Board fashion parade, judo display, vintage cars), games for young and old (golf, archery, children's train, giant balloons, etc.) and two monster raffles. **Would anyone willing to buy or sell tickets in the latter please contact Geoff Watson at CSIRO, Geelong.**

Printed by CSIRO, Melbourne

BENEVOLENT FUND

The first meeting of the General Committee of the New South Wales Fund was held in the Hicks Room, Division of Food Research, North Ryde, on 30th November 1972. The Committee comprises representatives from the eleven groups already formed—the twelfth and final group should be formed shortly.

The General Committee elected the Executive for the ensuing year with M. J. Puttock (NSL) as President and Mr A. Fogerty (Food Research) as Secretary.

The first Annual General Meeting of the Fund then followed and, although full membership details were not available, it was obvious that there had been a good response in all groups. Thanks to the goodwill of the members of the committee of the original four funds in New South Wales, the new Fund is beginning its career with a credit in excess of $10,000—a very sound start indeed!

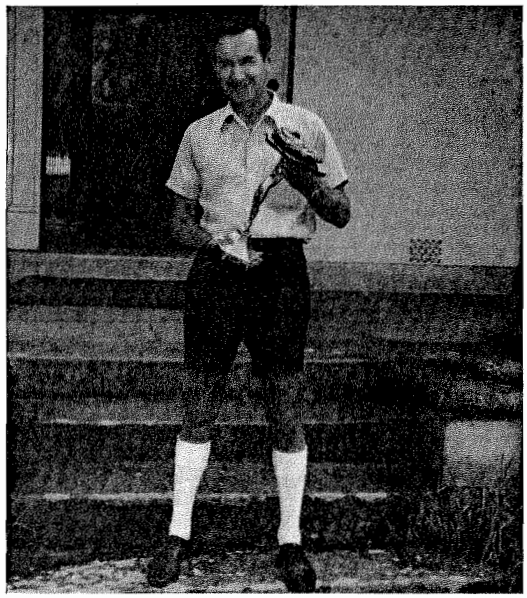
Ms Helen Barry (above) of the Division of Building Research, launches her plane in the paper plane competition held by the Division. Over 80 planes were entered in the two classes, distance travelled, and time in the air.

Barry Schafer, appropriately of the Structures Lab won the distance travelled event. The time in the air event was won by Eric Brown of the Electrician's Shop, with an ingeniously designed helicopter-type of plane that caught a thermal and rose instead of descending.

Former President of the Social Club at DBR, Bob Cooper, said that if there was enough interest they would be prepared to organise an inter-Divisional contest of this highly skilful sport.

Photo by Peter Lee

Ms Rosslyn Bott, (below) of the Division of Mathematical Statistics, receiving the Ladies Trophy for the 1972 BP 1000 Hills Rally. The rally is held around Adelaide. Ms Bott is pictured receiving her prize from the State Manager of BP, Mr J. A. Roberts.



Award Winner

The highlight of the staff Christmas luncheon at the Division of Textile Physics is by tradition the annual merit award ceremony, which starts each year about the middle of the sweet course. A spokesman gives a brief description of the award and at the end of each announces the winner, who then comes forward amid acclamation to receive it. There is a putative donor of each award, some of which are quite elaborate. One of the major awards is a silver nymph holding up a tray on which lies a dark coloured dry mass resembling an unsuccessful attempt at cake-making. This particular award is made to the year's best bull artist, and was given this year to a new member of the experimental workshops staff, Bill Downey (pictured above).

The most important presentation is one given on the recommendation of the Chief. This is a handsome silver cup and is therefore not lightly awarded. It is for the man or woman in any part of the Division who demonstrates during the year a high standard of devotion to duty. As is so often the case, no suitable candidate could be found this Christmas.

—John Platt

SAFETY NOTES

Trolley for Gas Bottles

A trolley for the safe storage and transport of cylinders of compressed gas has been developed by one of our Divisions (Pictured below) It enables research staff to change over bottles from a small storage area with the minimum of time and maximum of safety.

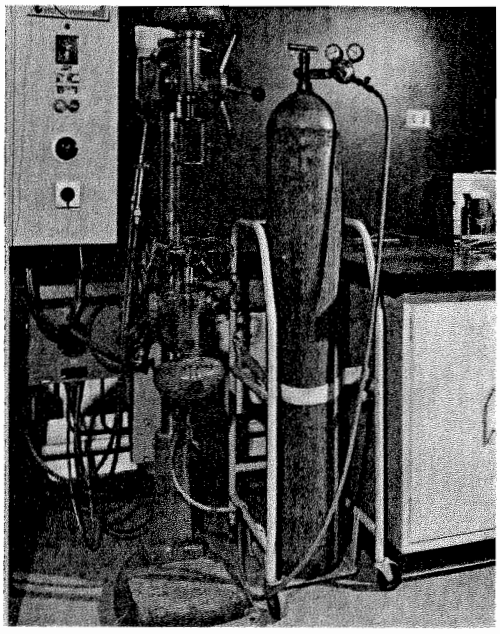
The problem of having a number of bottles in a laboratory is overcome because of the ease of transport from one project to another and there is no necessity to have set positions where permanent attachment is made to bench or wall.

The design of the trolley enables gas bottles of all sizes to be tilted only before being pushed on to the platform; a car safety belt then holds the bottles back into veed plates so that at 4 m.p.h. a sudden stop caused by an obstruction at the castors will not tip the bottle and trolley over.

Positive positioning in a laboratory is by means of built-in brakes on two of the castors of the trolley.

Detailed drawings of the trolley are available from Mr T. F. Wignall, Divisional Engineer, Division of Chemical Physics.

J. W. Hallam, Safety Officer.



coresearch

For circulation among members of CSIRO staff

May 1973

168

Land Research Reorganized

A major reorganization of research for Australia's land resource utilization has taken place. Following a detailed review initiated last year, the Executive decided to establish a group of three research Divisions as the Land Resources Laboratories. These laboratories will co-ordinate and intensify research programmes for the definition, evaluation and efficient management of Australia's land resources.

The new group will comprise a Division of Land Use Research, Division of Land Resources Management and a Division of Soils.

The Division of Land Use Research, comprising major segments of the former Division of Land Research including the Rangelands Research and Woodland Ecology Units, will be based in Canberra. Its roles will be to survey land resources, assess their potential and develop new research techniques.

The Division of Land Resources Management, an entirely new Division formed from those sections of the Division of Soils and the Division of Plant Industry in Western Australia, will be based in Perth. It will have the responsibility of developing management techniques for achieving optimum productivity consistent with conservation of the resource. It will also study environmental implications of changes in land use.

The third in the new group will be the Division of Soils. It will continue to be based in Adelaide as at present and will continue its studies of soils, including their management for crop, pasture and forest production as well as other effects of man's activities on soils.

Co-ordination of the work of these three Divisions as the Land Resources Laboratories will be achieved through a committee of their Chiefs, the chairmanship being held initially by Dr E. G. Hallsworth, Chief of the Division of Soils.

The Chief of the former Division of Land Research, Mr G. A. Stewart, has been appointed Officer-in-Charge of a new unit, the Agro-industrial Research Unit, which will work on certain aspects of the industrial use of plant materials.

Reasons for changes

Commenting on the changes, the Minister for Science, Mr W. L. Morrison, said that the reorganization had been brought about by increasing competition for land and growing concern over environmental problems. The Government had expressed its concern for scientific research to be relevant to man's total needs and there was equal concern for the effects of man's activities on his environment.

It was expected that the techniques of land resources assessment and management developed as a result of the new research programmes would help to guide government and private agencies concerned with the impact of man-made changes on the environment.

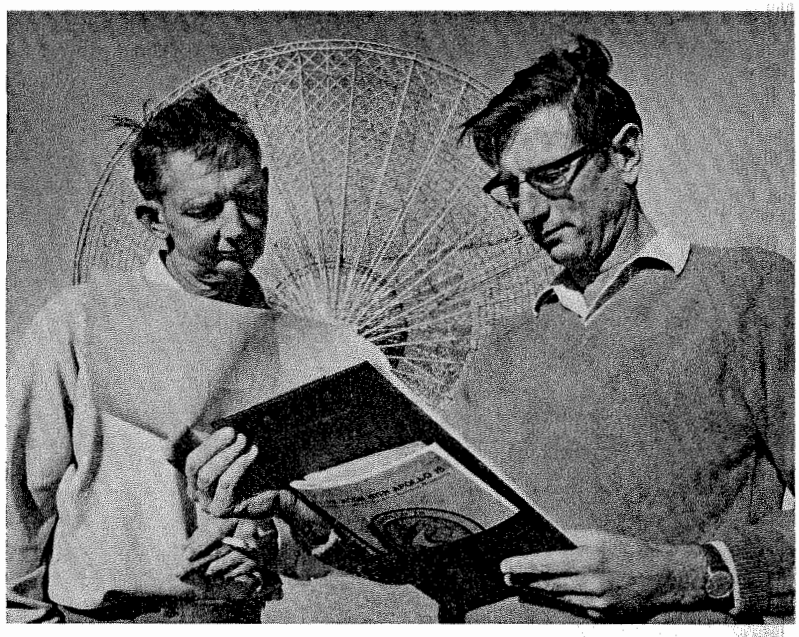
Projects such as the study of land resources of an area of the New South Wales south coast being carried out by CSIRO in collaboration with the New South Wales Department of Environment for instance, would receive increasing attention and CSIRO would also continue its involvement in research on the management of land where ecological balance had been unduly disturbed by man.

Effects

The ramifications of this reorganization of CSIRO research will affect other Divisions.

The Land Resources Laboratories will relinquish the crop research work of the former Division of Land Research. This work, carried out at several regional stations, will be transferred progressively to other Divisions currently engaged in crop research.

An immediate change has been the transfer of the Katherine Research Station, Northern Territory, and the Tobacco Research Institute at Mareeba, North Queensland, to the Division of Tropical Pastures. This Division, with its headquarters in Brisbane, has been renamed the Division of Tropical Agronomy.



F.R.S. FOR ASTRONOMER

Mr John Bolton of the Division of Radiophysics has had double honours conferred upon him. He has been elected a Fellow of the Royal Society, London, and has also been elected to the Honorary Fellowship of the Indian Academy of Science.

Mr Bolton's election to the Royal Society comes as recognition of his contribution to radio and optical astronomy, particularly the development of instruments and the optical identification of radio sources.

Similarly, his election to the Indian organization is in recognition of his 'distinguished contribution to science'.

John Bolton joined the CSIR Division of Radiophysics in 1946 and worked at the Dover Heights Field Station with the sea interferometer. While surveys of radio sources and general Milky Way radiation were proceeding with this instrument, he led his men in a lunch-hour occupation of digging a large hole in the sandhill cliffs. An 80-foot diameter radio telescope was built in this and in 1953 he and his colleagues identified the galactic nucleus with the source of Sagittarius A.

That same year he transferred to the Cloud Physics Section to extensively reorganize methods of research. In 1955 he was appointed Professor of Astronomy and Physics at the Californian Institute of Technology and established the Owens Valley Observatory of which he was the first Director. While there John Bolton gave a great impetus to American radio astronomy at a time when efforts there seemed to be flagging.

He returned to the Radiophysics Division in 1961 to become Director of the Australian National Radio Astronomical Observatory at Parkes. He has achieved considerable success in the research field there, extending his work to the discovery and identification of radio sources, particularly quasars. He uses both the radio facilities at Parkes and the optical telescopes at Lick, Mt Palomar, Mt Stromlo and Siding Spring Mountain in this work.

From July 1969 John Bolton also led the Apollo Mission's support at Parkes.

Above: John Bolton (left) with the Chief of the Division, Dr Paul Wild, at Parkes during the Apollo 15 mission.

Better Communication Vital

Communication is becoming one of the major problems facing the human race—and this is in spite of better education, vastly improved techniques of communications, television and other media.

This opinion was expressed by the Chairman, Dr J. R. Price, at a recent CSIRO Communication Symposium held in Canberra.

He was speaking to more than 70 staff officers representing 32 Divisions, in residence at the Australian National University.

CSIRO had to recognize the responsibility it had to keep the community as a whole informed about its activities, Dr Price said. It had to know how the Organization used the resources which were made available to it.

This might be described as a public relations exercise which would influence and, hopefully, improve the Organization's relations with people outside.

'The day has passed when it could be claimed that every additional dollar we received had to go towards supporting more research', Dr. Price said. 'We must recognize that to be viable and effective we have to ensure that as many Australians as possible know what CSIRO is doing, why we are doing it and what impact it has on the well-being of the country.

'Only by knowing what CSIRO has achieved can the nation have confidence in our ability to tackle the ever-arising and more difficult problems that have to be met and overcome.

'Put in a less altruistic way,' Dr Price said, 'it must be remembered that politicians react to public pressure and that public pressure concerning CSIRO may be strongly influenced by the effectiveness of our public relations.'

If CSIRO were to operate effectively, in terms of the Science and Industry Research Act, there also had to be good internal communication between its numerous operating units, between individual Divisions and Head Office, he said.

This should not be limited to mean between geographically separated groups. It called for a two-way flow of information within each group.

The problem of internal communication also called for understanding between the abstract entity — the Organization — and the individual employees. The instances when the Organization failed to achieve effective communication with an individual on matters of importance to the person concerned occurred all too frequently.

Dr Price spoke of the importance of the communication link between him and the Minister for Science. It was essential, he said, that the Minister should understand what CSIRO was doing and why, and that he supported these activities. Equally, it was essential that the Organization should know the views of both the Minister and the Government on CSIRO activities and on the national needs which they considered CSIRO should try to meet.

There was the responsibility with which CSIRO was charged to ensure its research results were made use of and that its discoveries were put into practice. This called for communication between the Organization and primary and secondary industry. And again, it was essential that this was a two-way exchange since it was vital for CSIRO to know the needs of industry, Dr Price said.

OBITUARIES

Dr E. A. Cornish

Dr E. A. Cornish, Chief of the Division of Mathematical Statistics, died on 31 January.

Dr Cornish graduated in agricultural science from the University of Melbourne in 1931 and was appointed as an agrostologist at the Waite Agricultural Research Institute in Adelaide.

In 1937 he went to England to study and work under Sir Ronald Fisher at the University College, London. He returned to Australia the following year and was appointed statistician at the Waite.

He joined CSIR in 1941 as Senior Research Officer of the Biometrics Section in Melbourne. In 1944 the Section became the Section of Mathematical Statistics and transferred to Adelaide.

Dr E. A. Cornish

In addition to being Officer-in-Charge of the Section, Dr Cornish became an honorary lecturer in mathematical statistics at the University of Adelaide.

By 1959 the programmes in Statistics had advanced to the point where the University decided to create a Chair and Dr Cornish was appointed Foundation Professor of Mathematical Statistics.

His appointment was for a five-year term. Towards the end of it he recommended a full-time appointment to the Chair. He retired from the University in 1964 to concentrate on his CSIRO duties.

In 1954 the Section became the Division of Mathematical Statistics with Dr Cornish as its Chief.

Dr Cornish was a distinguished statistician and agricultural scientist. He was a Fellow of the Australian Academy of Science and a Foundation Fellow of the Australian Institute of Agricultural Science.

He was awarded the Institute's Australian Medal of Agricultural Science in 1951. Dr Cornish was an Honorary Fellow of the Royal Statistical Society, a member of the International Statistical Institute, and served as President of the Biometrical Society in 1956.

Dr D. Lafeber

Dr D. Lafeber, Assistant Chief of the Division of Applied Geomechanics, died on 2 January 1973.

Dr Lafeber came to Australia in 1953 with a wide experience in petrology, geomorphology and practical geology. He was born in Holland and was a graduate of the Geology School of the University of Amsterdam. His activities in Europe ranged from geological mapping in Northern Sweden to petrological studies in granites and basalts in Western Germany.

On arrival in Australia he joined the Snowy Mountains Hydro-electric Authority where he worked for seven years as a petrologist and Officer-in-Charge of the Geological Laboratory within the Authority's Scientific Services Division.

He joined the Division of Applied Geomechanics in 1960.

His work in CSIRO covered the developing discipline of quantitative description of the fabric of soils (and later rocks). Arising from his studies in these fields, he published 16 papers and became a widely accepted authority on this subject.

His task — of providing a quantitative description of soil and rock fabric for engineering use — was still incomplete at his death. However, his meticulous records of observations remain as does the inspiration which his attitude to research inspired in his colleagues.

DOCTORATES

Two more members of CSIRO have had the degree of Ph.D. conferred upon them. They are **Mr J. T. Bullivant** of the Head Office staff section and **Mr G. A. Rockwell,** experimental officer with the Division of Animal Genetics.

Mr Bullivant received his degree from the University of New South Wales for a thesis entitled 'Rearrangements of Cyclic Compounds in the Gas Phase'. Mr Rockwell was awarded his degree by the University of Sydney for his thesis on 'Respiration and Molecular Organization in the Cell Envelope of *Pseudomonas fluorescens*'.

Staff Offered Special Rates For Book

Staff members of CSIRO may order copies of the book *The World and South East Asia* (Oswald Ziegler Enterprises Pty Ltd) at the special concession rates of $7.95 (prestige edition) and $4.95 (popular edition).

The offer has been made by the publishers who say that although CSIRO is not specifically mentioned in the book, many of the features in it have a direct or indirect association with the interests of CSIRO staff.

The book, which was produced with the co-operation of government departments and both government and private organizations throughout the region, is profusely illustrated, mostly in colour. It also contains a good selection of maps.

The contents of the two editions is identical but the cover of the popular edition is a semi-stiff one with a transparent plastic over-cover.

It is suggested that secretaries of social clubs might organize bulk orders. Postage varies from State to State. In New South Wales it is 55c; Victoria, Queensland 65c; South Australia, Northern Territory, Tasmania, Papua New Guinea 75c and Western Australia $1.20. For airmail add 50c per pound. The weight of the book is 6 lb.

ADVISORY COUNCIL

Mr R. B. Whan, A.L.P., the Member of Parliament for Eden-Monaro, has been appointed to the CSIRO Advisory Council. He replaces **Mr K. E. Beazley** who resigned following his appointment as Minister for Education.

SAFETY NOTES

To those who cannibalize

Some laboratory apparatus from overseas is designed for use on 110 volts and adapted for 240 volts by building in a step-down transformer. Often useful equipment, such as motor-driven pumps and fans, can be salvaged from surplus apparatus of this type and used elsewhere.

But—a word of warning to those contemplating doing this. Understandably 110 volt equipment would not react kindly to being plugged in directly to a 240 volt supply. Motors could dangerously overspeed and other components fail. Staff in one Division had a shattering experience when a motor failed from this cause.

To avoid this happening, a double wound, step-down transformer should be permanently wired to the equipment, or, where a 110 volt supply is available, a plug and socket connection designed for this voltage should be used. The plug has two round pins and one flat one and cannot be accidentally inserted into a standard 240 volt outlet.

Your Agony — Our Solution

New topics are wanted for Safety Notes. How about letting us know of your safety problems, at work or at home, or ways you have overcome them. A selection of those of general interest will be published, with our advice and comments.

No prizes for the best and neatest entry, but we would like to hear from you.

—Gil Barnes, Safety Officer.

Letters to the Editor

Sir,

As Coresearch has now discontinued the use of the titles 'Miss and Mrs' in favour of 'Ms', I would like to know what is the correct pronunciation of this title, how it is used in addressing a woman in conversation, and, if it is an abbreviation, what is the full title.

B. H. Wall,
Division of Land Research,
Katherine Research Station.

Ms is pronounced Mzz as in Bzz. In conversation, as in writing, one uses Ms in place of either Miss or Mrs. If you are an old-fashioned Women's Libber and feel the need for a plural substitute for Misses (pronounced Missies) or Mesdames, may I suggest Mss (pronounced Mzzuzz). Ms is a hybrid of Miss and Mrs and to the best of my knowledge the full title of Ms is Ms. Incidentally, can anyone tell me how to write Mrs in full. No, it is not spelt missus.

—Editor.

Sir,

Ms Leadbetter's suggestion that we should have CSIRO knickers for the female members of staff is an excellent one which we should certainly pursue further. Possibly a pre-shrunk, creaseproof, all-wool design would be appropriate.

M. C. Pig,
Animal Husbandry.

Sir,

"Re (Re 'Definition'
Coresearch 165)
Coresearch 167.

A more usual value for the velocity of light in furlongs per fortnight is 1.802618×10^{12}.

D. L. H. Gibbings,
National Standards Laboratory.

DRY RUN FOR NEW BOAT

'Launching' a ship on dry land? Not the usual custom but the Division of Atmospheric Physics at Aspendale recently succeeded in doing just that.

The occasion was the naming of the Division's latest acquisition — a 21-foot power boat to be used to ferry scientists, supplies and instruments to a meteorological tower soon to be erected in Port Phillip Bay.

The boat was drawn up on the grass of the instrument area at the rear of the laboratories in Station Street where the staff gathered to watch the christening and 'launching' by Mrs Priestley, wife of the Division's Chief, Dr C. H. B. Priestley, F.R.S.

In traditional champagne style, the vessel was named after Leonard Deacon, a foundation member of the Division who has just retired after 25 years at the laboratories.

Leonard Deacon is internationally known for his research work in evaporation, solar radiation (sunshine) and atmospheric turbulence (the means by which heat and water vapour are distributed throughout the world's atmosphere).

Atmospheric physicists and meteorologists are only now beginning to realize the value and importance of making measurements over the sea, but Leonard Deacon was at the game 20 years ago. And he did it then working from a sailing boat.

Above: A dry run for the *Leonard Deacon* . . . from left: Dr Priestley, Mrs Priestley, Mr Jim Stevenson, the boat's skipper, and Leonard Deacon.

Editorial Changes

Max Bourke, former editor of Coresearch, has been seconded to the staff of the Minister for Science, Mr W. L. Morrison. His departure from the editorial chair resulted in the non-appearance of the March and April issues of Coresearch.

Max has been succeeded by a former New Zealand journalist, Dorothy Braxton, who in 1968 became the first New Zealand woman journalist to break the petticoat ban on Antarctica.

Dorothy went south on the *Magga Dan* and landed on the Antarctic Continent at Victoria Land and visited the United States and New Zealand bases in McMurdo Sound. She also landed on the sub-Antarctic islands of Macquarie and Campbell, and the Auckland group.

Her difficulties in getting permission to go south to the ice — a 12-year struggle — and her eventual experiences down there are recorded in a book she later wrote, *The Abominable Snow Women* (Reeds, 1969).

A few months later, Dorothy headed for a different climate and spent a year working for the Administration in Papua New Guinea. She came to Australia in 1970 and has been working as a journalist for the Commonwealth Public Service.

NOVEL MENU FOR DUKE'S LUNCHEON

The fine food and wine served to the Duke of Edinburgh at a CSIRO luncheon during his visit to Canberra was not just ordinary Australian-grown produce. It came from closer to home — most of it was produced as part of recent research programmes carried out in the Divisions of Animal Physiology and Food and Horticultural Research.

The lunch was hosted by the Executive and guests included senior officers of the Organization concerned with conservation and environmental research. Prince Philip was present in his capacity as President of the Australian Conservation Foundation.

The fillet steak was cut from an 18-months-old Friesian steer raised at the Prospect Laboratory of the Division of Animal Physiology, Sydney. For the previous six to eight weeks, the beast was given a feed supplement based on sunflower seeds. The meat contained about 10 times the normal amount of polyunsaturated fats.

The Division of Horticultural Research provided the wines for the occasion. It is making small experimental bottles of wine at its research station at Merbein, Victoria, to test the wine-making properties of introduced varieties of grapes and of the many hybrids they produce in their vine-breeding programme. The Division is also investigating whether there is any difference in quality between wine produced from mechanically-harvested grapes and that produced from hand-harvested fruit.

Table grapes offered to Prince Philip included Italia and Merbein seedling MH 12-81, two varieties which have the same parent, Bicane and Muscat Hamburg. Bicane is a white table grape with a neutral taste and excellent fresh texture, while Muscat Hamburg is a black grape with an attractive spicy muscat flavour. Italia was produced in Rome about 60 years ago and is now grown successfully in many countries, including several in the tropics. MH 12-81 was produced at Merbein only a few years ago and is still under test. Both have inherited the fresh texture of one parent and some degree of muscat flavour from the other.

Among the dried vine fruits on the tables was Shirana 19, a new raisin grape variety bred at Merbein as a replacement for the currant. It is an early maturing seedless variety with a small black berry and a tough skin. Unlike the currant, the ripe fruit is not split by rain.

From Merbein, too, came Macadamia nuts and pistachios. Most of the commercial Macadamia nuts are produced in Hawaii, but they are now being grown successfully by CSIRO under irrigation at Merbein where the dry inland climate appears to reduce the problem of disease.

The pistachio, which originated in Asia, could find a new ecological niche in Australia. Unlike other crops, it likes windy situations, extreme summer heats and poor soil. It also tolerates quite high levels of salt. At present the only pistachio orchard in the country is on the Merbein station.

The cheese came from the Dairy Research Laboratory of the Division of Food Research in Melbourne which supplied some of its Cheedam variety, a name given to it because of its distinctive taste which is somewhere between that of cheddar and edam. The cheese is prepared from the milk of cows fed on a polyunsaturated feed supplement at the Dairy Cattle Research Station of the Victorian Department of Agriculture. The cheese dip on the tables was also made from milk high in polyunsaturated fats.

Two varieties of apples were offered to the Duke. One was the Cox, the premier eating variety of Europe which grows exceptionally well in Tasmania and is widely exported. The luncheon ones came from the Tasmanian Department of Agriculture's Huon Research Station.

The second variety was the Granny Smith which has become Australia's premier export variety. This apple has a 'chancey' history. It seems that its story started in 1868 when Mrs Smith found a few green Tasmanian apples in the bottom of a gin case she brought home from the Sydney market. She tipped the fruit into the creek next to her orchard at Ryde, but subsequently an apple tree grew and fruited on the bank. The apple was appreciated and from then on has been grown and developed to the crisp, rather tangy fruit that it is today.

Below: The Chairman of the Executive, Dr J. R. Price, with the Duke of Edinburgh at the luncheon in Canberra. Holding the door is Mr S. Smith from Head Office.

RETIREMENTS

When three members of the Central Library and Information Service in Melbourne — Jeanette Dunstone, Eva Lucas and Marjorie Simpson — left the Organization earlier this year they had totalled up among them more than 61 years of service.

Ms Dunstone joined CSIRO in 1941 and for the greater part of her time on the staff played an important role in the development of information services. Her particular contributions included the compilation and maintenance of the index to all the Organization's published works, together with its associated collection of publications, and the compilation and editing of the monthly publication, CSIRO Abstracts.

She was also responsible for the development and operation of a referral service which now handles some 6500 phone and written enquiries from public and private sources each year.

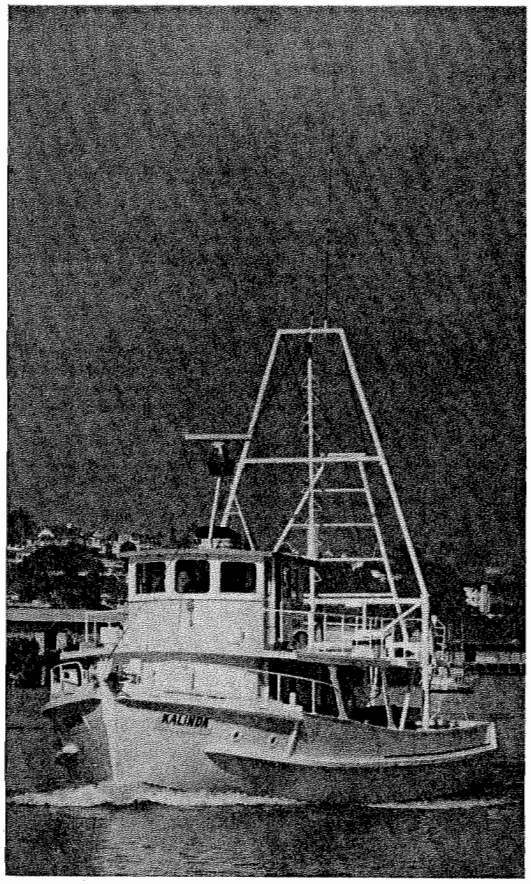
Associated with this activity, Ms Dunstone built up a Thesaurus of more than 30,000 subject terms covering all aspects of the Organization's research programme.

Ms Lucas who joined CSIRO as a stenographer in 1956 was not as widely known as Ms Dunstone, but her initials are familiar to those receiving letters from Mr Lewis Lewis, a member of the Executive, to whom she was secretary for many years.

After the transfer of Head Office to Canberra, she remained in Melbourne to provide secretarial assistance both to Mr Lewis and to other members of the Executive.

Ms Simpson, who also joined the Organization in 1956, was for many years personal secretary to Mr Walter Ives, a member of the Executive, and in latter years was secretary to the Chief Librarian, Ms Betty Doubleday.

Presentations were made to the women by Mr L. G. Wilson, Secretary (Administration), on behalf of the staff of Head Office, both in Canberra and Melbourne.



New Vessel Launched For Prawn Research

CSIRO's new research vessel, *Kalinda,* which was launched at Brisbane in March, is to take part in a prawn research programme, operating from the Fisheries Research Station at Deception Bay, Queensland.

This will involve an investigation of the scientific problems associated with the prawn fishery in the off-shore areas outside Moreton Bay. A study of the oceanographic environment of the prawn stocks will be made, their distribution and their migrations will be investigated and information will be gathered on their spawning and on the movements of young prawns back into the nursery areas of Moreton Bay.

The project is a joint one between the Queensland Department of Primary Industries and the Division of Fisheries and Oceanography. CSIRO's Dr Peter Young is the project leader.

The *Kalinda* is a 70-foot double-rigged prawn trawler built by B. J. and B. P. Thompson Pty Ltd with funds provided from the Fisheries Development Trust Account. Of wooden construction and built to a design by Mill Kraft Boat Yard Pty Ltd under the supervision of the then Department of Shipping and Transport, the vessel is powered by a 260 h.p. Rolls Royce C6TFLM marine diesel. It has a top speed of 10½ knots.

It is equipped with modern radar, sonar, automatic pilot and radio, both a trawl winch and a try net winch and has a freezer capacity of 25 cubic feet.

At the launching ceremony, the vessel was given its Aboriginal name — a word meaning the sea — by Mrs K. Radway Allen, wife of the Chief of the Fisheries Division.

Above: The new research vessel, *Kalinda,* leaves for the prawn fishery outside Moreton Bay.

(Courtesy 'Brisbane Courier Mail')

Sirofair

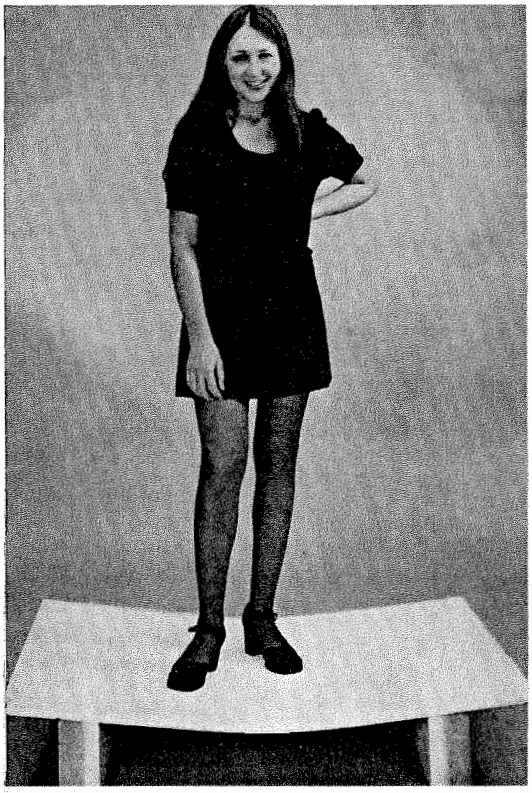
About $3000 was raised by the social club of the Division of Textile Industry when it held its 'Sirofair' at Geelong in March.

The money will go towards the club's community service project, the building of 'Sirovilla', a proposed complex of houses for elderly people. With $11,000 now in hand, the venture is eligible for government subsidy. Negotiations are already in progress for land near the Division's headquarters and it is hoped that construction will start this year. The club already has a waiting list of potential tenants.

'Sirofair' was well supported by staff and outsiders. About 5000 people attended and nearly 400 helpers were involved, many of whom were volunteers from local service groups and other organizations.

Apprentice Award

Ken Fisher, apprentice painter of the Division of Textile Industry, has been awarded the Certificate of Merit of the Master Painters, Decorators and Sign Writers Association of Victoria. The award came for Ken in recognition of his gaining highest marks in all trade subjects for first year apprentices in the State last year.



One of the projects of the Division of Building Research at Highett, Victoria, has been the production of a gypsum glass board. Basically this is a modern version of the old fibrous plaster board with two layers of glass fibre being used in its production, one near each face. These act as a restraint to cracking and, among other things, offer better fire protection. The new material has already been patented by CSIRO and negotiations are under way with an application for its commercial manufacture. Elizabeth Watson demonstrates the strength of doubly reinforced gypsum glass board.

LIBRARY TALK

Satisfied customers! We hope there will be many more, when the Central Library and Information Services (CLIS) 'current awareness' service based on CA CONDENSATES is offered to all CSIRO officers and to outside organizations.

Thirty-four Divisional monitors (research scientists and librarians) from all States and the ACT were primed to help prospective users to understand and enter the system (Selective Dissemination of Information—SDI) (Coresearch No 165, December 1972) at the first SDI Monitors Workshop held in Melbourne recently.

During the workshop a very lively discussion was stimulated by the enthusiastic, but often very dissimilar, views of current users of the CA CONDENSATES service including Dr A. J. W. Moore (Division of Tribophysics), Mr W. Raper (Division of Chemical Engineering), Dr J. Ward (Division of Mineral Chemistry) and Dr L. 't Mannetje (Division of Tropical Pastures).

Judging from the encouraging Divisional monitor response, the success of the workshop and the number of scientists who have now indicated that they would like to become users, interest in current awareness services in CSIRO is rapidly increasing.

INSPEC (Institute of Electrical Engineers) and CA CONDENSATES (CHEMICAL ABSTRACTS SERVICE) became available to CSIRO users as from 1 January 1973. At present, outside organizations can only subscribe to CA CONDENSATES. Additional magnetic tape services are being investigated and further workshops will be arranged as new monitors come into the system.

Ian A. Crump, Central Library and Information Services.

Walk Against Want

Ms Jean Conochie of the Central Library and Information Service wants to thank the many hundreds of CSIRO colleagues who supported her in the Walk Against Want. Jean completed the marathon distance of 42 km and the total of her contribution was $610.

The Director of Community Aid Abroad has asked Jean to pass on sincere thanks to CSIRO supporters. The income from the Walk will be applied to carefully selected development projects where human needs remain as urgent as ever.

(Jean's thanks are not late. We just missed a couple of issues of Coresearch so couldn't pass the message on earlier—Ed.)

Medal

The 1973 Medal of the Australian Institute of Agricultural Science has been awarded to **Dr C. H. Williams,** senior principal research scientist with the Division of Plant Industry in Canberra.

Dr Williams has been credited with the first chemical study in Australia of the soil factors involved in the fertility changes that take place in the soil through the combination of superphosphate and subterranean clover.

The citation for his award says that by demonstrating the importance of studying the chemical and biological factors involved in the interaction between soils and fertilizers, Dr Williams had 'stimulated a new, important and widely accepted approach to soil fertility research in Australia'.

Professor

Dr H. R. C. Pratt, formerly Chief of the Division of Chemical Engineering, has been appointed Visiting Professor in the Department of Chemical Engineering at the University of Melbourne.

Associate

Dr J. V. Possingham, Chief of the Division of Horticultural Research, has been appointed an Honorary Associate in the Department of Agronomy at the University of Sydney.

Visitor

One of France's leading viticultural research workers, **Dr P. Huglin,** has been a guest of the Division of Horticultural Research in South Australia.

Director of Viticultural Research at Colmar, Alsace, France, Dr Huglin has made major research contributions in the field of vine physiology, clonal selection, vine breeding and virus indexing.

While he was in Australia, Dr Huglin spent most of his time discussing common viticultural research interests with senior CSIRO scientists, particularly Mr Allan Antcliff with whom he had talks on the latest trends in vine breeding and clonal selection, and Dr Peter May who is concerned with bud fruitfulness and trellis design.

During his seven-week stay in Australia, Dr Huglin visited the major viticultural areas. His travels allowed him time to meet Department of Agriculture research and extension workers and to discuss local practices with them.

New Aircraft Landing System Devised

The development by Australia of a highly advanced aircraft landing system will be brought a step closer with the start of Stage 2 of a major research project by CSIRO working in collaboration with the Department of Civil Aviation.

The new system provides curved flight paths and a variety of approach angles which will greatly increase airport utilization and improve noise abatement procedures. It will be submitted to the International Civil Aviation Organization (ICAO) for consideration for world use.

The latest part of the project, called Interscan, involves designing, fabricating, installing and testing a complete microwave landing system under operational conditions.

Interscan is based on an antenna of novel design invented by the Division of Radiophysics. DCA is providing essential technical information and is evaluating all aspects of the project. The stage has now been reached where it could be made and installed for testing under operational conditions.

The present system in use is the very high frequency (VHF) instrument landing aid. In operation since the 1940 s, it is limited to providing landing guidance along a single straight approach path aligned with the centre of a runway and at a fixed approach angle. Because of technological advances with aircraft and increasing traffic densities, it is believed that VHF will not be able to cope with the needs of the 1980 s and beyond.

ICAO therefore established requirements for a new, more versatile approach and guidance system to meet the demands of civil aviation for up to the next 30 years. This would be phased in gradually in the late 1970 s.

Both CSIRO and DCA are confident their project will meet the requirements and provide high performance at reasonable cost. It will also have characteristics important to Australian aviation such as modular construction for easy expansion, simplicity, and ease of siting and maintenance.

Royal Society

The Royal Society of Tasmania has elected a woman to the office of senior vice-president for the first time.

She is **Dr June Olley** who is Officer-in-Charge at CSIRO's Tasmanian Food Research Unit in the Tasmanian Regional Laboratory.

She joins two other CSIRO members on the Society's Council — Mr M. H. Bennett, Administrative Officer of the laboratory who was elected at the same time, and Mr K. D. Nicholls who was already a member of the executive.

Credit Society Eligible For Home Grants

An application by the CSIRO Co-operative Credit Society to be registered as an approved body whereby persons saving with the Society would be eligible for the Home Savings Grant, has been approved by the Commonwealth Department of Housing.

According to a Society's report, this is deemed to have taken effect on and from 1 September 1971.

This means that depositors who have entered into a contract to buy or build a home on or after this date may claim their deposits with the Society as 'acceptable savings' if they have met the conditions of the Home Savings Grant Scheme and are applying for a grant.

The conditions are set out in an explanatory pamphlet entitled 'A Grant For Your Home'. Divisional Administrative Officers will have copies of this for those who wish to see it, but further copies and any other information may be obtained from the Regional Officer of the Department of Housing in the various States.

Interest rates for deposits

The rates of interest currently applicable to the four classes of investment with the Society are as follows:

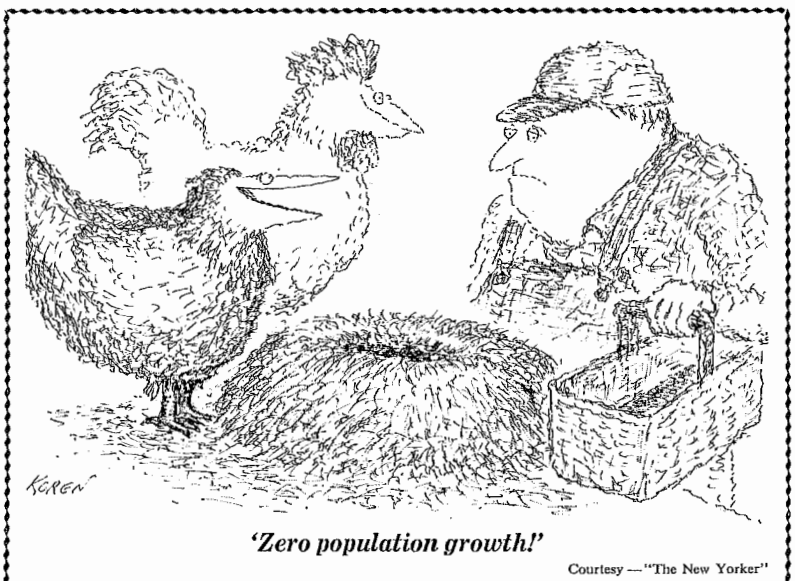
Class 1 — Amounts deposited by fortnightly deduction from salary — 6% p.a.

Class 2 — Fixed amounts deposited for 12 months or less — 6% p.a.

Class 3 — Fixed amounts deposited for more than 12 months — 6¼% p.a.

Class 4 — Fixed amounts deposited for more than 5 years — 7% p.a.

The Board is pleased to announce that Classes 3 and 4 are now available for investment. However, after a close appraisal of trends in outside investment rates, the Board has decided to reduce the current rates paid by the Society for Classes 3 and 4 by ¼%, the new rates to be effective from 1 June 1973. The new rates for these classes will then be 6¼% (Class 3) and 6¾% (Class 4) respectively. The rates for Classes 1 and 2 will remain unchanged at 6% p.a.



'Zero population growth!'

Courtesy — "The New Yorker"

Printed by CSIRO, Melbourne

coresearch

For circulation among members of CSIRO staff

June 1973

169

TWO THOUSAND SEE DENILIQUIN LAB

A balloon used as part of the equipment in low level aerial photography and flown at 370 feet above the Rangelands Research Unit at Deniliquin, New South Wales, proved an effective way of arousing interest in the Unit's first 'open days' at their laboratories.

The event, staged during 4-5 May, was a successful public relations exercise, giving the people of Deniliquin and the surrounding area a chance to observe some of the research programmes undertaken by CSIRO in their region.

About 900 adults took the opportunity to visit the laboratory on the Saturday and on the Friday 1160 school children were shown around.

Visitors on the Saturday included the Federal Minister for Immigration and Member of Parliament for the Riverina, Mr A. J. Grassby, and Dr M. F. C. Day of the Executive. Two chartered aircraft flew in from Canberra with staff members from the Unit which was recently integrated with the new Division of Land Use Research as part of the Land Resources Laboratories.

Following their tour, official visitors were entertained at an informal luncheon at the home of the Officer-in-Charge, Dr Allan Wilson and his wife, Christine.

Most of the people outside the Organization had little idea of the extent of the Australian rangelands which, they were told, cover 2.2 million square miles or nearly three-quarters of the country. An appreciation of this fact and a comprehensive photographic display in the entrance hall gave them an insight into the complex issues which concern the rangelands and the problems associated with both the animals which graze on them and their environment.

The need for research was pinpointed by a static display showing, for instance, that in 1880 these areas had carried 16 million sheep. By 1969 the number had dropped to nine million.

The display showed how the Unit was investigating ways

- plants and animals survive and grow in arid climates
- grazing and other land uses damage the soils and plants
- meat and wool production can be improved while the condition of the rangelands is maintained
- and the problems of soil erosion and the means of preventing it.

Equipment

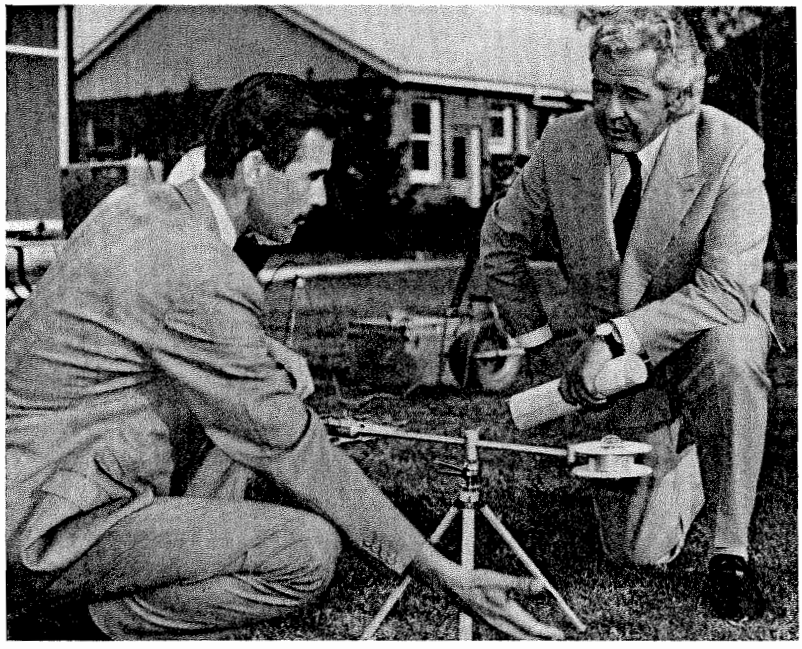
The Deniliquin laboratories are well equipped with modern scientific aids and much interest was shown in displays. People were shown various methods of measuring climatic influences such as the anemometers set at varying heights to show the speed and direction of the wind above the vegetation. Staff were on hand to demonstrate the working of the automatic analysis of plant and soil samples and to show how the atomic absorption flame spectrophotometer worked.

Considerable interest was shown in the equipment with which the rates of photosynthesis and transpiration of leaves are measured, thus allowing researchers to discover how the majority of the rangelands plants are able to survive in the harsh conditions under which they have to exist.

One of the ways by which management of the land can be assessed is by the use of 'indicator' plants such as the Dillon bush which may increase in saltbush territory once the land has been denuded by overgrazing. Staff explained the work being done on these plants which fits into the research being carried out on the prevention of severe degradation of vegetation in the arid zone.

One method of observing this vegetation and the changes in its growth rates is by low level aerial photography, a method which in certain instances is

Cont'd on page 4



Minister Briefs Press On Skylab Mission

Before the United States space laboratory, Skylab, was launched from Cape Kennedy on 15 May, the Minister for Science, Mr W. L. Morrison, held a press conference in Sydney to brief journalists on Australia's particular interests in the project.

The conference was held at the Division of Mineral Physics where journalists were able to see equipment used in analysing pictures of the earth resources which were obtained through ERTS-A, the Earth Resources Technology Satellite which orbited the earth last July, and to see what would be involved with the Skylab programme.

At the time of going to press with this issue of Coresearch, there were still doubts as to the success of Skylab, but if the project is continued it is hoped that it will be able to provide a series of photographs of Australia from a height of 270 miles above the ground in comparison with the height of 517 miles at which ERTS-A orbited the earth.

Four areas of the country were to be under the laboratory's scrutiny — Mt Isa, Alice Springs, Kalgoorlie and Canberra. Skylab was to make seven passes a day over Australia but data would be obtained only when meteorological conditions were favourable. The laboratory was to repeat its path over a given point about every five days.

The pictures which the laboratory was scheduled to take will be valuable in such areas as

- detecting air and water pollution and environmental effects of urban development.
- detecting diseases of trees, crops and pastures.
- assessing land and water resources
- providing information for research in oceanography and geology.
- providing information which could assist in the more rapid location of mineral deposits and potential oil-bearing structures.

Australia's participation in the programme was arranged under the United States/ Australia agreement for Scientific and Technical Co-operation through ACERTS, the Australian Committee for Earth Resources Technology and Science.

The committee, which has representatives from CSIRO and the Departments of Minerals and Energy, Science, Supply, Army, Primary Industry and the Northern Territory, is under the chairmanship of Dr N. H. Fisher of the Bureau of Mineral Resources. Dr Fisher is also the principal investigator for Australia in the earth resources experiments which were scheduled to be conducted by Skylab.

The Division of Wildlife Research had a Royal visitor last month — the Crown Prince of Japan, Prince Akihito. Dr H. J. Frith, Chief of the Division, outlined the programme of research to the Prince and discussed with him the problems of wildlife conservation in Australia and Japan. Picture shows the Crown Prince looking at a young grey eastern kangaroo held by Peter Flegg. In the centre is Dr H. J. Frith, Chief of the Division.

Above: Dr Mike Duggin, Mineral Physics, demonstrates to the Minister for Science, Mr W. L. Morrison, an instrument for measuring solar flux. This is used in making ground measurements to correlate with aerial and satellite data. (Photograph: Gordon Shrubb, Minerals Research Laboratories.)

Blankets, bras and bedsores . . .

—THEY'RE ALL IN A DAY'S WORK FOR TOM PRESSLEY

The phone rings in Dr Tom Pressley's office at the Division of Protein Chemistry at Parkville. 'Come quickly. We have a problem'.

It's The Royal Melbourne Hospital's Central Linen Service and all the nurses' aprons have turned blue instead of white.

'Wait till I've had my lunch,' says Tom, noting the time, and hangs up. The phone rings again.

'We can't wait until you've had lunch. The matter's urgent.'

So Tom Pressley rolls down his sleeves, puts on his jacket and heads for the hospital laundry. It's a place he's familiar with . . . over the years he has spent a lot of time there and has conducted many experiments for them and solved a lot of their troubles.

These have ranged from devising a way to wash woollen blankets at high temperatures and still have them come out in their original size, white and soft. He has found ways to launder sheep skin rugs so that they can be used for the comfort of patients and he has found out what causes a load of nurses' aprons to come out of the laundry a different colour.

Tom Pressley gets a lot of satisfaction from his work. Talking to him, you get the impression that every time someone presents him with a problem, he sees it as a personal challenge.

One of the 'best' was the time he was asked to find a solution to the problems relating to woollen blankets and the so-called 'golden staph'. The Royal Melbourne was greatly concerned because it was believed, both overseas and in Australia, that woollen blankets were the carriers of the bacteria. Most hospitals were in the process of changing to cotton blankets but the Royal Melbourne wanted to be sure before they followed suit.

They asked for the help of CSIRO and the problem was handed over to Tom. In his meticulous way, he set about proving — or disproving — the theory.

Bacteria

'Many people believed the bacteria would be found in the fluff on the floor. I thought it was more logical to at least start looking at bed level, but I had to be sure. I think people thought I was mad then. I spent the next few days crawling round the floors in the wards gathering samples of the fluff. I analysed the fibres and experiments showed that the fibres and the bacteria were moving in different ways. This meant we could exonerate both wool and cotton from being the carrier.'

The hospital was still unsure about its use of woollen blankets, however, unless they could be washed at a high temperature. The shrink-resistant ones they had when washed came out brown after absorbing iron and were as rough as emery paper.

To Tom this was just another challenge. He worked out a formula for a new detergent and came up with the concept of a product specifically designed for the washing of wool spread. This was taken up by commercial manufacturers, particularly Unilever, and today similar products sell as 'Softly' in Australia, New Zealand and South Africa and under a different name in Belgium. It became one of the select few of the company's products to go from Australia to overseas countries — most of their products come the reverse way.

With more blankets being washed, bigger machinery was used and new problems associated with shrinkage developed. This led to the development by engineers of Tom's Beam Dry Chlorination process. 'Since then we haven't been able to shrink a blanket,' he said.

For some reason manufacturers were not much interested in the idea of marketing shrink-resistant blankets. However, within the last few months interest has been aroused once more and Tom is doing further research into the subject. One woollen mill, North Western, hopes to manufacture them soon.

Consultant

By this time, Tom had become chemical consultant to The Royal Melbourne Central Linen Service and Group Laundry. 'Their next major issue was of particular interest to me,' he said. 'One of the surgeons had read in an American medical journal that a hospital in Alabama had found the use of sheepskin rugs solved the bed sore problem. The trouble lay in the difficulty in laundering them.

'I was a sitting duck for that assignment because I was a sheepskin tanner before I joined CSIRO.'

Tom devised a laundry technique and later recommended pastel colours to overcome staining problems. The first medical sheepskins in Australia were made under direction from CSIRO, but since then they have been made on a worldwide basis.

By a coincidence, however, the best product for medical purposes comes from a firm in Christchurch, New Zealand, from where Tom originally comes. 'The rugs used in Victoria are currently imported from Christchurch; they are not made in Australia,' he added.

One of the most unusual tasks Tom was set was to help devise a mammary prosthesis or false breast which women could use — and launder — following an operation for breast cancer. A patient had come up with an experimental bra but it had presented laundering problems. Tom was called in to see if he could suggest an improvement.

Winner

The original one was made from medical sheepskin to go against the scar, with wool fabric on the outside, and was stuffed with wool and bird seed for weighting. It was a winner for comfort but was unwashable.

'I tried various ideas, including sand for weighting. That worked for comfort and weight but soiled the bra when it was washed. I asked for the help of the Division of Building Research and they devised a chemical way to clean the sand. We had our bra that could be laundered and, in association with the Peter McCallum Clinic, we developed it to the stage where it was a good pro-

Cont'd on Page 4

Delegates For Solar Research

Five officers from the Divisions of Mechanical Engineering and Building Research will attend the international congress on solar energy entitled 'The Sun in the Service of Mankind' in Paris next month. The conference will bring together for the first time the annual congresses of the two international associations specializing in research for the application of solar energy, the International Solar Energy Society and the Mediterranean Co-operation for Solar Energy.

The conference will link these two groups to the study work days regularly organized by the French Association for the Research and Development of Solar Energy. It will also be under the patronage of UNESCO which is concerned with the sun as a source of unpolluted energy largely available in many underdeveloped countries.

The main topics of the conference will include:

- the sun and life
- the sun and energy
- the sun and housing.

Participants will include scientists, engineers, architects, planners and other researchers who come from a wide range of disciplines such as doctors, agronomists and physicists who have a related interest in the subject.

The congress hopes the meeting will result in an exchange of ideas and debates which will indicate where points of agreement may be reached, where there will be opposing views and where areas of uncertainty and lack of knowledge will indicate the need for more research.

CSIRO delegates will be: Division of Mechanical Engineering — R. N. Morse, Chief, W. Reed, P. I. Cooper and E. T. Davey; Division of Building Research—E. R. Ballantyne.

CAA TREK

The Community Aid Abroad Group from the Division of Textile Physics recently took part in a walk against want in Sydney. Sponsored by CAA, the trek started in Australia Square, followed a 13-mile circuitous route around Rose Bay and Vaucluse and finished at the University of Sydney.

The Division's team netted $134.71 towards their particular project for CAA, the provision of a Persian wheel for the village of Joramoh in the Indian province of Bihar. The cost of the wheel will be $210.

Each check-point along the route was manned by a CAA group which had on display an exhibit which showed what their particular project involved. For the Division's display, the Chief, John Downes, constructed a model of the wheel which was then powered through the efforts of Roger Foulds. It was seen in action providing water to a 'field' of wheat which had been grown for the occasion by Bob Haly.

Below: Roger Foulds explains the mechanism of the Persian wheel to Mary Ferguson, Division of Textile Physics.

MISS AUSTRALIA

Naomi Green, a clerical assistant in the Sydney Regional Administrative Office, is a candidate in this year's Miss Australia Quest. Naomi, who is widely known throughout

CSIRO through her association with Laboratories Credit Union Limited, is sponsored by the Imperial Club, Blacktown, and Mr F. Colman, photographer. She recently took part in a fashion parade held at the Wentworth Hotel and has many fund-raising activities planned.

Honour

Dr D. F. Waterhouse, Chief of the Division of Entomology, has been awarded the 1973 Farrer Medal for his contributions to agricultural research. The honour is in recognition of Dr Waterhouse's efforts which have contributed greatly to the rationalization or elimination of the use of persistent pesticides.

FRED SCIENTIST—
—A Sober Sort

The average CSIRO scientist is in no danger of becoming an alcoholic. Nor is he likely to be picked up for driving over .08 per cent — or .05 if he lives in Victoria — because he apparently spends comparatively little time in pubs.

Nor, if figures can be believed, does he spend too much of his budget on drinking in his leisure hours at home.

At least these are the conclusions one can draw from a look at the results of a survey just released from CSIROOA (the Association of Officers of CSIRO). According to the report, Fred Scientist claims his weekly budget for alcoholic drinks is just under $3. It would seem that staff in Perth and Townsville would have fewer non-drinkers among their numbers than in other parts of the country, a fact possibly attributable to the warmer climates of those cities. It could also be said that scientists in Canberra still like their drop of red or can of the cold and frothy.

Adelaide, on the other hand, showed that 21 per cent of their scientists are non-drinkers.

From the report, which was compiled from 307 processed replies to questionnaires sent to staff all over the country, it seems that the average scientist, who may be an experimental officer grade 3, a senior research scientist or even a principal research scientist, is at the 'interesting' age of 40. He likes to have his wife stay at home and he doesn't believe in large families — he heads a household of 1.9 adults and 1.7 children.

His gross income in 1970-71 was about $10,000 so he is on a better-than-average wage and chances are that it will have increased since then anyway. His additional income is generally less than $400. The survey shows his income increased by about 27 per cent from the time of the pilot economic survey made in 1970 but his budget went up only by 15 per cent. However, inflation being what it is, that situation may have deteriorated from the time the association compiled its report at the end of last year.

Food bill

CSIRO families enjoy a good standard of living and spend about $8 to $10 per head a week on food, an amount which will almost certainly have risen in the last few months. In the EO3 and SRS grades the values in this category were lower but this may be because of economic experiences or family stage of development, the report says.

Fuel costs for families are significantly higher in Canberra and Melbourne and significantly lower in Sydney, Brisbane and Townsville.

The chances are Fred is not addicted to smoking, or he has kicked the habit. But it was interesting to note that there were more non-smokers among the Geelong group of the survey — 82 per cent — and over the whole area 65 per cent were listed as non-smokers.

No 'bombs'

Our scientists do not feel strongly about having luxury model cars nor do they feel a new car is necessary every year to provide the joys of life. He probably owns 1.3 motor vehicles, most of them will be 6.4 years old and he is just as likely to have bought them from the used car lots as bought a new one.

But the cost of the average family car was about $2500 while his second car, if he has one, would be valued around $1200 when he bought it. That means, he is not exactly buying an old 'bomb' for his wife. It was noted that EO1s may spend slightly less on cars.

Geelong again stood out in this aspect. They prefer to keep their cars for three years longer than scientists elsewhere although Sydney staffers tend to buy a new one after 5.5 years. Of the 410 vehicles listed on the survey, GMH scored 32 per cent, Leyland 17 per cent, Chrysler 12 per cent, VW (including vans) 11 per cent, Ford 9 per cent, Toyota 5 per cent, Datsun 3 per cent, Mazda 2 per cent, Renault, Peugeot and Fiat 1 per cent each, and motor cycles 2 per cent.

The table below shows the average scientist's annual budget as it stood in 1971 with the changes shown from the 1970 pilot survey.

	$	Changes from 1970	
Rent, loan repayments (housing)	1000	—	
Rates	160	+ 10	
Fuel	160	—	
Fire and general insurance	50	—	
Superannuation and life assurance	940	+ 230	
Motor vehicle registration and insurance	125	+ 15	
Motor vehicle running costs and fares	450	+ 120	
Telephone, TV, radio	120	+ 25	
Educational expenses	310	—	
Clothing	310	+ 40	
Medical expenses	240	—	
Holiday expenses	270	+ 40	
Food	1580	+ 40	
Sundries	160	— 10	
Beer, wine, spirits	130	+ 30	
Subscriptions to professional societies	45	+ 10	
Sports, hobbies, entertainment	315	*	
Home maintenance	170	*	
Income tax	2065	+ 555	
	8600	+ 1105	(15%)

*Not sampled previously.

A top-level delegation of Russians interested in cotton research has been visiting Australia. The group's itinerary included the cotton growing regions of Queensland, New South Wales and Western Australia. Members expressed particular interest in the high density and agronomy programme and the conservation of Australia's wild species of cotton. At Griffith in the Murrumbidgee Irrigation Area, the visitors were the guests of the Division of Irrigation Research where this picture was taken. From left: Mr A. Low, Irrigation Research; Dr A. A. Avtonomov, Deputy Director, Cotton Research Institute, Tashkent; Dr N. K. Lemeshev, Senior Scientific Officer, All Union Institute of Plant Industry, Leningrad; Mr N. V. Ermolaev, Deputy Chief, Cotton Division of the USSR Ministry of Agriculture, who headed the delegation, and Dr K. D. Dzhamankulov, Director of the Tadjik Research Institute of Soil, Tadjikstan. They were accompanied by Mr F. Stack, Department of Primary Industry, Canberra.

AROUND THE SHELVES

Staff of the Central Library and Information Services, East Melbourne, are busy doing isometric exercises to strengthen their arm muscles so they can handle the latest production of the unit's computerized programme — a printed catalogue of the Central Library's textbooks. The document weighs 20 lbs and measures 2 ft x 1 ft.

The group has also been pleased to handle another object recently — it has been the recipient of a Commemoration Medal, struck by the Smithsonian Science Information Exchange, to mark the publishing of the first edition of 'Science and Technology: Research in Progress'.

The Smithsonian Science Information Exchange, Washington, acts as a clearing house for the reporting of research in progress predominantly in the United States and Canada, but also increasingly covering research activities throughout the world.

P. H. Dawe

SDI Services

The group plans to introduce additional machine readable data bases early in the 1973-74 financial year to provide current awareness services for scientists and engineers. They will include BA PREVIEWS, the magnetic tape service which corresponds to 'Biological Abstracts' and 'Bioresearch Index', CAIN, the US National Agricultural Library's service associated with the monthly 'Bibliography of Agriculture' published by CCM Information Corporation, and COMPENDEX the magnetic tape services of 'Engineering Index'.

All of these services are comprehensive. BA PREVIEWS annually includes 240,000 source items from a total of 8000 journals. Corresponding statistics for CAIN are 120,000 source items from 6600 journals and for COMPENDEX 85,000 items from 1600 journals.

Current awareness services based on CA CONDENSATES (Chemical Abstracts) and INSPEC ('Physics Abstracts', 'Electrical and Electronics Engineering Abstracts' and 'Computer and Control Abstracts') are now available in CSIRO. The INSPEC Service includes the text of abstracts in addition to bibliographic information. Members of CSIRO staff who feel that they are having difficulty in keeping up with the literature, are invited to participate in a free trial of the CLIS service. In 1972 'Chemical Abstracts' cited 379,048 papers, patents and reports and the abstracts filled 27,355 pages.

Clyde Garrow, CLIS

Title Please

With the regular appearance of library notes in Coresearch from now on, the column needs the right title. Something brief, imaginative — and apt. Suggestions will be welcomed by the editor who so far hasn't succeeded in thinking up something brief, imaginative and apt.

Editor

Thought for the week

Keep our city clean . . . eat pigeons.

GOLF MATCH

The annual Forest Products Golf Day was held at the Patterson River Country Club, Carrum, with the team from Cemac-Mallinson capturing the Muncey Cup for 1973.

This was the seventh year the match has been staged for which the Muncey Cup is the main trophy. It is named after its donor, Dr R. W. R. Muncey, Chief of the Division of Building Research, Highett.

The cup is competed for by teams of four players from CSIRO Divisions and private companies related to the timber and paper industries. This year's winning team comprised P. Webster, M. Thomas, H. Williams and C. Terry. In second place was the team from Victorian Forests Commission.

In the individual events, the morning trophy was won by K. Fricke, Building Research, and the afternoon pairs went to H. Williams and C. Terry of Cemac-Mallinson.

A total of 96 players took part, accompanied by 18 caddies from the various Divisions. At a dinner party which followed the match, the trophies were presented by Walter Kauman, Assistant Chief of the Division of Building Research, to the winning players. Credit for the organization of the event this year went to George Davies, Division of Applied Chemistry, Forest Products Laboratory.

Ridder of the Golden Ark

Dr D. L. Serventy who, until his retirement in 1969, was Officer-in-Charge of the Western Australian activities of the Division of Wildlife Research, has been appointed a Ridder (Knight) in the Most Excellent Order of the Golden Ark in Holland. The honour was conferred upon him by Prince Bernhard of the Netherlands for outstanding service in the cause of nature conservation.

Dr Serventy was able to receive the honour personally at an investiture held at Soestdijk Palace last month during the course of an overseas tour.

While he is away, Dr Serventy hopes to visit England and he has been invited to visit Israel to give a series of lectures at the University of Jerusalem.

Swiss Student Enjoyed Highett

A little bit of the sparkle went out of the Division of Building Research the day Ms Ursula Roethenmund departed from the Highett scene and headed for Tasmania.

Ursula, a Swiss architectural student, enjoyed six months with the Division and although she spent part of the time assisting in the study of living conditions in remote communities in tropical Australia, when she was at Highett she became something of a personality around the place.

While work with the Remote Communities Environment Unit might seem a far cry from the kind of problems she could expect to encounter on her return to Switzerland, Ursula said that there was much concern in her country over the drift of rural populations to the cities. She felt that she would well be able to apply techniques she had learned here to local situations.

Ursula's placement with the Division was organized through the International Association

Ursula Roethenmund

for the Exchange of Students for Technical Experience, an association which concerns itself with assisting recent graduates and students to gain practical experience in countries other than their own. To date 40 Australians have been assisted under the scheme, but Ursula was the first overseas student to be placed in Australia.

After leaving Highett Ursula went to Tasmania for a brief holiday and is now working with a firm of architects in Sydney for the remainder of her six months stay in Australia.

Obituaries

FORMER CHIEF OF ANIMAL HEALTH DIES

The death has occurred of Mr D. A. Gill, a former Chief of the Division of Animal Health and Production. Born in England in 1900, Mr Gill gave a lifetime of service to the animal industry.

A graduate of the Royal College of Veterinary Surgeons, London, he joined CSIRO in 1937, succeeding Sir Ian Clunies Ross as Officer-in-Charge of the McMaster Laboratory of Animal Health.

Before then, however, he had gained the Diploma of Veterinary State Medicine at the University of Edinburgh. In 1923 he went to New Zealand to work as a veterinary officer and in 1928 was appointed Assistant Director of the Department of Agriculture's Veterinary Research Laboratory at Wallaceville.

During this period of his career Mr Gill made many notable contributions to research, especially in the field of bacteriology.

Mr Gill came to Australia in 1933 as a relieving lecturer in veterinary pathology and bacteriology at the University of Sydney, but returned to New Zealand for a short time in 1935. Back again in Australia, two years later, he was appointed to the McMaster Laboratory which was subsequently expanded considerably through his work and encouragement.

Always known in CSIRO as 'Jim', and not formally as Dudley, his correct name, Mr Gill was actively engaged in developing parasitological research both at McMaster and at the laboratories later established at Armidale and at Yeerongpilly in Queensland.

He took a leading part in the practical development of methods for control of blowfly strike in sheep. Another of his achievements was his work towards the establishment of close links between research and extension staff in the sheep and wool field in State Departments of Agriculture.

In 1954 Mr Gill was appointed Chief of the Division of Animal Health and Production which he represented on the Australian Committee of Animal Production. In addition he was Chairman and Convenor of the technical Subcommittee set up by the Standing Committee on Agriculture for the control and eradication of contagious bovine pleuropneumonia. It was largely as a result of his efforts that a plan for bringing this serious disease under control was accepted by the States and Northern Territory.

Mr D. A. Gill

At the time of his retirement in 1960 Mr Gill had established himself as an outstanding scientific administrator. During 1962-63 he made a detailed survey of sheep and wool research in Australia for the Wool Board's Research Committee and in 1967 became Executive Officer of the National Bovine Brucellosis and Tuberculosis Committee.

In 1962 he was awarded the Gilruth Prize by the Australian Veterinary Association in recognition of his services to the profession.

His funeral was attended by a number of 'McMaster Originals', people who had worked there in the 1930s, and many others who were on the laboratory staff in later years.

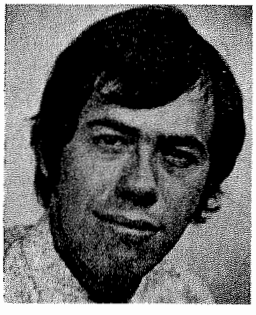
Highett Scientist Killed

The death of Dr Peter Scanes in a motor cycle accident in Melbourne took from the Division of Building Research, Highett, one of the most promising young members of their staff.

Peter had joined the Division only 18 months previously after receiving his Ph.D. in London.

In his brief time with Building Research he brought his work on thermal investigation to an interesting stage and had reported some of it in a paper that was to be presented at the international congress, 'Sun in the Service of Mankind', in Paris next month.

Peter was a keen rower and also took an active interest in the CSIR Ski Club.



Peter Scanes

Academy Fellow

Dr R. H. Wharton, Officer-in-Charge of the Division of Entomology's Long Pocket Laboratory, Brisbane, has been elected to the Fellowship of the Australian Academy of Science. The honour came in recognition of Dr Wharton's extensive and valuable contributions in the fields of malaria, filariasis and cattle tick.

Printed by CSIRO, Melbourne

Precisely . . .

The noble art of communication . . . the State Electricity Commission in Victoria has received a letter from an engineering firm:

'Further to your letter of March 26, we know you believe you understand what you think we said, but we are not sure you realize that what you heard is not what we meant.'

—'The Herald', Melbourne.

Deniliquin Lab

Cont'd from page 1

more satisfactory than either by normal aerial photography or even satellite pictures. It was this display that was using the 370 ft high balloon to suspend a camera at 70 ft above the ground.

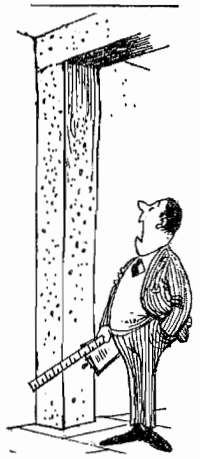
Goat study

The animals of the rangelands came in for scrutiny with visitors being interested in the possibility of grazing goats in dense scrub country, one of the aspects under consideration by the Unit. The team concerned is also carrying out a study into the carrying capacity of the land in regard to goats and to see if, as an alternative, goats could be used temporarily to clear unwanted scrub so that a return to sheep grazing would be possible.

A lot of interest was displayed in CSIRO's development of rugs for sheep, a project now taken up by a commercial enterprise. Two penned sheep were used to show the differences between the fleece of an animal which had been wearing a rug and one which had not.

Many people had heard about the dung beetles imported some years ago to help with the problem of bush flies. At Deniliquin they saw the insects in action during the varying stages of the 48 hours it takes for them to break a dung pad down. Most were slightly staggered to learn the task the beetles have been given — according to the statistics given, 33 million tons of dung (dry weight) are dropped on Australia every year.

The beetles are also being observed as part of the research into nutrient cycling—it is possible they may have an important role in providing previously unavailable nutrients for rangelands soil by the way they break up and bury the pads.



'I'm afraid it will mean destroying their natural habitat.'

Courtesy: 'Punch'.

Tom Pressley

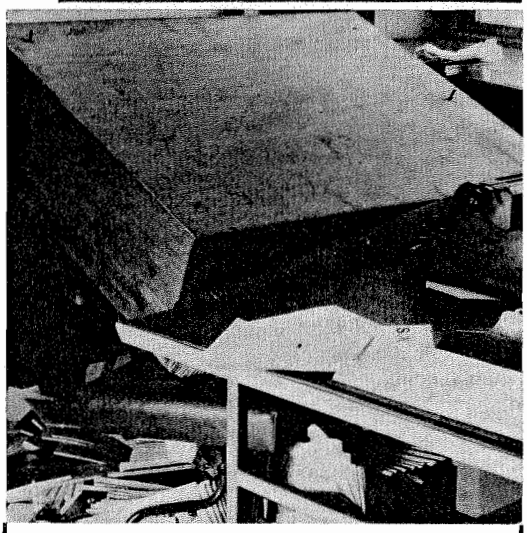
Cont'd from Page 2

position for a commercial firm. It is now widely used by cancer patients.'

Currently, Tom is working on important research into the problems associated with the flammability of materials. The results of this could have far-reaching safety applications for the people of Australia and possibly further afield.

Over the years Tom has seen people make a lot of money out of the results of his research. This, he says, is their good luck. His own rewards come in a different way — the satisfaction of seeing a practical application of research or of being able to contribute in a modest way to a problem that has caused other people a lot of concern.

SAFETY NOTES



Insufficient Means of Support

As can be seen from the photograph, the bookcase in question could no longer take the strain of the publication explosion. It was fixed (?) to a brick wall by six screws and lead plugs. The weight of the shelves and books was 350 lbs. Fortunately, no one was hurt, but do you sit in front of, or near, a similar bookcase?

Check up on the security of the fixing — it could save a lot of headaches.

Eenie, Meenie, Mynie, Mo!

Which is about as good a way as any other in determining which end of the hose carries the nozzle in some of the latest water-type fire extinguishers. The manufacturers have made such a neat job of providing a recess for the nozzle that it takes an expert to determine which end is which.

Complaints have been received from various laboratories on this matter but representation to one of the larger manufacturers received a negative response.

It is recommended that the nozzle end is distinguished in some way, either by painting it red or wrapping a piece of red PVC tape around the hose near the nozzle. There is no time in an emergency to play guessing games with an extinguisher.

—J. W. Hallam, Safety Officer.

Letters to the Editor

Sir—

In answer to your plea, according to the Concise Oxford Dictionary 'Mrs' is spelt in full 'Mistress'. Oddly enough, so is 'Miss'. This suggests a happy solution to our problem. Let us reverse the divergent evolution that led to 'Mrs' and 'Miss' and revert to calling our ladies 'Mistress' (spelled of course, 'Ms'). It has a fine Falstaffian ring. I reject, by the way, the opinion of a writer in the 'Canberra Times' that 'Ms' is properly pronounced 'manuscript'.

—Donald H. Colless,
Division of
Entomology.

Yes, but one of the meanings of the word 'Mistress' — and I, too, quote the Concise Oxford Dictionary — is 'a woman illegally occupying the place of a wife'. Which does tend to raise a few doubts, although, as one of my colleagues says: 'It's the uncertainty that's the fascination.'

—Ed.

Sir—

You may be interested to read this extract from the Shorter Oxford English Dictionary:

'Mrs 1582 (Orig. an abbrev. of Mistress).

1. In the 17th c. often written for Mistress — 1679.
2. As a prefixed title of courtesy. Now pronounced (mi·sis, mi·siz); cf. Missis. a. Prefixed to the surname of a married woman who has no superior title 1582. b. In the 17th and 18th c. prefixed to the name of an unmarried lady or girl — 1791.'

—P. M. Fleming,
Division of
Land Research.

Sir—

Once upon a time all adult Englishwomen who did not rate the title of 'Lady' were addressed as 'Mistress' regardless of marital status. In the 17th Century, the written contraction 'Mrs' came into use at a time when the 'tr' in the middle of a word was still sounded in speech. But 'Mistress' was less important than the name which followed it so English people began saying it quickly with what stress there was full on the first syllable. The 'tr' fell out giving 'Mis·ess' as we still say it.

'Master' (which began as a title for a man who knew his job) developed a written contraction of 'Mr' and the spoken form of 'Mister'.

—(Ms) S. E. Ingham,
Editorial and
Publications
Section, Melb.

Sir—

A recent correspondent (Coresearch 168, p.2) has pointed out that the correct value of C is, in fact, 1.802618×10^{12} furlongs per fortnight. Evidently he is unaware that the SFA system (Standard Furlongs per Annum, where 26 fortnights is 1 annum) should be employed.

For his information we obtain the value 4.686807×10^{13} SFA.

K. G. Weir,
National Standards
Laboratory.

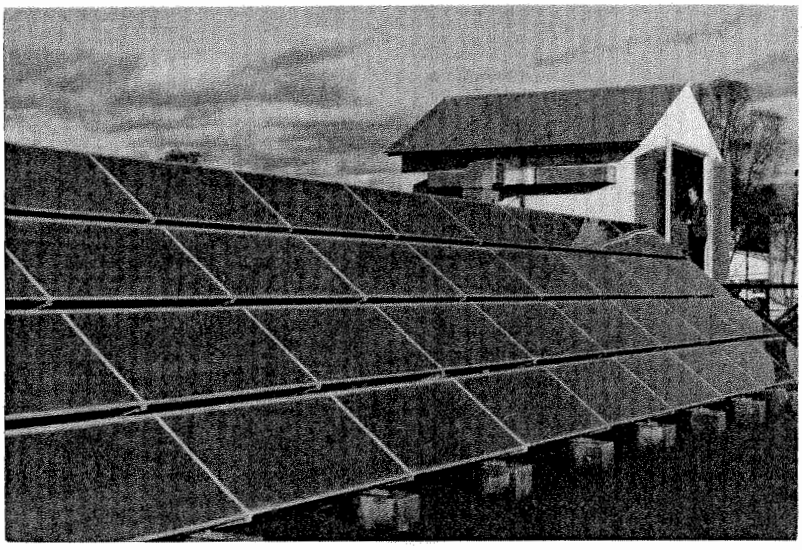
The Editor invites correspondence for this column. Names will not be used if people prefer anonymity but names and addresses must be supplied. All correspondence should be addressed to the Editor, Coresearch, Box 225, Dickson, ACT 2602.

coresearch

For circulation among members of CSIRO staff

July 1973

170



The experimental solar energy kiln at Griffith with its bank of absorbers. Making a check on the timber being dried in the kiln is Mechanical Engineering's Griffith representative, Graeme Flood.

SOLAR ENERGY APPLICATIONS UNIT MAY BE SET UP IN CSIRO

A solar energy applications research unit may be set up within CSIRO. The desirability of having such a unit established was expressed at the end of a two-day conference held in Canberra last month when 50 scientists from 23 Divisions met to review CSIRO's research in the field of solar energy and its commitment to meet the needs of Australia in the future.

Speaking at the meeting, the chairman of the conference and Executive member, Mr. V. D. Burgmann, said he envisaged the unit being composed of a small group of scientists who would have the responsibility of making a continuous study of solar energy and its applications and, in particular, would co-ordinate the work currently being undertaken by a number of different Divisions.

"The purpose of such a unit would be to cull information from each Division working in this field, to make in-depth studies, write papers and disseminate knowledge," he said.

In welcoming the delegates, Mr. Burgmann earlier said that the Organization had been carrying out research on, and development of, practical applications of the use of solar energy since the mid-1950s. The use of solar energy, however, had to be seen in context with the total energy resources, not just of Australia, but also of the rest of the world. CSIRO had a responsibility to exercise foresight and he felt that the conference would give participants a chance to clarify their thoughts.

One of the leading personalities behind CSIRO's work on solar energy has been Mr. Roger Morse, Chief of the Division of Mechanical Engineering. The immediate Past-President of the International Solar Energy Society, Mr. Morse, in an interview, said that Australia was well to the fore with its research. "Our position was best described in a report by the National Science Foundation and NASA when it was commenting on solar energy as a national energy resource in the United States. In this it said that America was lagging behind Australia, France and Israel."

Mr. Morse said that the energy crisis occurring in some countries had drawn attention to the depletion of the world's fossil fuels on which everyone was critically dependent for most of their primary energy. "It isn't a question of whether these fuels will run out but when, and there is now wide agreement that within 30 years we could see acute shortages and price rises. Within 15 years some countries could suffer serious economic and trade dislocation."

Solar energy on the other hand was renewable, had minimal environmental problems and was available on a world-wide basis. As far as Australia was concerned, he felt that by the year 2000 the country could be using solar energy for between 10 and 20 per cent of its total energy requirements. It was already in use for water heating in homes and hostels, in desalination units and in timber kiln experiments at Griffith and Townsville.

The conference programme covered a wide range of aspects of the subject and included topics such as solar energy as a source of low grade heat, plants as collectors of solar energy, the conversion of organic matter to usable energy and central solar energy systems where high grade heat was used.

After the conference a number of delegates expressed surprise that so much work was already being done among the various Divisions on solar energy. The meeting, they said, had given them an opportunity

Cont'd on page 4

Powerful computer installed in ACT

The Division of Computing Research in Canberra is at present installing Australia's largest and most powerful computer. The computer, a Cyber 76 costing $4 million, will be able to operate many of its functions 20 to 30 times faster than the present Control Data 3600 unit.

A Boeing 707 was chartered to bring the 30 tons of computer and ancillary equipment from the United States. Canberra airport did not have the facilities to unload the equipment and so it was off-loaded at Mascot and transported to Canberra on four semi-trailers. The cost of the air charter alone was more than $50,000.

The Cyber 76, which will be housed at Black Mountain, Canberra, is the only one of its kind in the Southern Hemisphere. Very few units have been installed outside the United States.

It will be plugged into "CSIRONET", the network of CSIRO's smaller computers located in other States.

A further $1,000,000 will be spent to increase the number of batch terminals which will feed into the Cyber 76.

The 3600 presently in use is being operated for 22 hours a day and the Division has had to buy time on a Sydney computer to cope with the additional work. However, by 1 August the new computer should be linked to the present system.

Preparations for the computer's arrival were so well made that the acting Chief of the Division, Dr. P. J. Claringbold, said that he did not expect any computing time would be lost while the computer was being installed.

The 3600 was only "off the air" for one week last May, while preparations were made for the new computer. "There will be at least two weeks of acceptance trials after the unit is installed," Dr. Claringbold said. Then the installation team from the suppliers, Control Data Corporation, would return home.

The power consumption of the giant computer and the building in which it is housed will approach one megawatt.

The giant computer is freighted into Sydney by a chartered aircraft from the United States and taken to Canberra on four semi-trailers.

Current Affairs

The Division of Fisheries and Oceanography at Cronulla last month played host to 60 scientists whose interests lie in oceanography and related subjects.

The scientists came from all over Australia and represented not only CSIRO but also universities, institutes, colleges and Government departments.

The seminar was arranged to allow people to spend two days finding out what work was being done in what is regarded as a fractionated field. It was hoped that after two days of some formal addresses and many informal talks and discussions a clearer picture would emerge of what data are being collected in the various institutions and what programmes are being carried out.

Mountains and sheep—

They go together in the life of Dr Helen Newton Turner

The shelves which line the room of Dr. Helen Newton Turner in the Division of Animal Genetics in Sydney are stacked tight with books, catalogues, pamphlets and papers.

Her table is piled high with more books, papers and files. There is just room for one more file, one more sheet of paper on which she can write current notes.

The woman behind the desk, one of the world's leading authorities on sheep genetics, makes no apologies for this state of affairs. "Someone once told me that an untidy desk was the sign of a creative mind and I haven't worried about it since," she said.

Two months ago, Dr. Turner officially "retired" from CSIRO. But retirement for a woman who is as dynamic as she is, is a seeming impossibility. Instead of going quietly home to read books, potter in a garden or travel the world, Dr. Turner has accepted an honorary research fellowship for 12 months, the position to be renewed on an annual basis.

The only change her "retirement" has made to her life is that she no longer directs experiments and has dropped administrative duties.

"The phone still rings as much as ever and there's no shortage of work," she said in an interview with Coresearch.

The name of Helen Newton Turner is a byword, not just in CSIRO, but anywhere in the circles of sheep production.

Sheep research

In 1956 she was asked to lead the newly-formed animal breeding section in the Division, in charge of the Organization's sheep breeding research. She has been closely associated with all their major programmes since then.

In a remarkably short time, she had built an international reputation for herself which has since led to her invitation to be a consultant in sheep genetics on an FAO project in the Argentine and she annually carries out work for the Ford Foundation in the Middle East.

She has been asked to discuss sheep breeding research in Israel, South Africa and Kenya. She has lectured in Peru, the United States and Scotland and last year was invited to New Zealand by the NZ Wool Board.

She has looked at sheep breeding projects in Indonesia and when she was invited to China in 1965 by the Chinese Society of Zootechnic and Veterinary Sciences to discuss sheep breeding research and to give a series of lectures there, she left a little bit of her heart in that country's high mountainous regions of the north. "It's very beautiful there," she said. "I'd love to go back there some time."

Outside her work, Helen Turner loves mountains and as she says, "I'm lucky — mountains and sheep generally go together."

Himalayas

It's unfortunate, she says, there aren't any sheep in the Antarctic because she'd like to go there. But as a compromise she has been in among the snow and ice of the Himalayas. In 1961 she and Lady White, wife of Sir Frederick White, former Chairman of CSIRO, accompanied by a party of Sherpas, spent two months of "sheer pleasure" walking on the classical approach to Everest (they reached 12,000 ft.) and then did a pony trek into the high country of Kashmir after being forced out of the central Himalaya area when illness overcame the party.

Somehow along with her work, lecturing, broadcasting and speaking at many conferences both here and overseas, Dr. Turner has found time to be a prolific writer. She has written more than 100 scientific papers, has compiled chapters for two technical books, is co-author of a text book entitled "Quantitative Genetics in Sheep Breeding" with S. S. Y. Young, and has been asked to write this in a popular version. One day, she says, she'd like to write a travel book.

After more than 41 years with CSIRO — there are only three men on the staff who have served with the Organization for longer — Dr. Turner is in a position to look back over the growth of CSIRO and note the changes.

"When I first joined as secretary to Sir Ian Clunies Ross at the McMaster Laboratory, I had to be vetted by the Chairman. When I made my first overseas visit I had to be inspected by the Minister, no less.

"During the war years women received equal pay, but this right was taken from us after the men came back. It was only fully restored a year ago.

"But I'll tell you this . . . I have visited many scientific institutions during the course of my travels the world over, and I'm convinced the conditions we enjoy in CSIRO are the equal of any of them."

Equal chance

Dr. Turner says two lucky breaks greatly influenced her life.

"The first was being born into a family where it was taken for granted that a girl had equal rights for education with her brothers. I went to university and took a degree in architecture. But that was the time of the depression and when the firm I joined started to slow down I was kept on as a typist. When it finally closed I went off and took a course in shorthand and typing and worked for the State Government for eight months. Then came my appointment to the position with Sir Ian. That was my second lucky break, because he was the sort of person who encouraged his staff to make use of their talents and initiative."

For Helen Turner, stenographer, that meant taking up an interest in mathematics and then taking a year studying her new subject in England, from 1939 until 1956 she was a consulting statistician to various Divisions, and from then on her work has been with the sheep breeding section, where she says, subsequent Chiefs have also allowed her to have a free hand, a fact which she both responded to and appreciated.

Cont'd on page 4

Astronomers for Sydney

Over two thousand astronomers are expected to attend the Fifteenth General Assembly of the International Astronomical Union in Sydney next month.

The Australian Academy of Science will act as host to the Union which, founded in 1919, is one of the oldest of the international scientific unions.

For the duration of the assembly, 21-30 August, Sydney University will be the setting for meetings of the more than 40 commissions which make up the Union.

There will be three "invited discourses": J. P. Wild on "Solar Bursts", C. H. Townes on "Interstellar Molecules" and D. W. Sciama on the "Early Stages of the Universe".

There will also be joint discussions covering a wide range of astronomical subjects.

Before the Assembly, there will be symposia in Canberra and Perth, and after the Assembly two more symposia at Surfers' Paradise and Maroochydore.

Dr. J. P. Wild, Chief of the Division of Radiophysics, who will give one of three "invited discourses" at the General Assembly of the International Astronomical Union.

Among the visitors will be Professor Fred Hoyle of Cambridge and Professor Dr. Raimar Lust, President of the Max Planck Institutes, Germany.

MORE DEGREES AND AWARDS FOR DIVISIONS' STAFF

Applied Chemistry

Higher degrees have recently been awarded to a number of staff members at the Division of Applied Chemistry in Melbourne.

Dr. W. W. Mansfield received the Degree of Doctor of Science from the University of Adelaide on the basis of published papers collected under the general title, "Studies in pure and applied surface physics and chemistry".

The Degree of Ph.D. was granted to Mr. B. J. Poppleton (Monash University), Mr. R. S. P. Coutts (University of Melbourne), Mr. R. J. Eldridge (University of Melbourne) and Mr. C. D. McLean (Monash University).

The Degree of Master of Applied Science was awarded to Mr. L. F. Evans and to Mr. D. R. Packham (Victorian Institute of Colleges).

Textile Physics

Most people if they possessed a degree in science and engineering might well be satisfied with their results for long hours of hard work and study and be pleased to have time during long service leave for thinking about nothing in particular except private hobbies. But not so Henry Lunney, an engineer with the Division of Textile Physics.

In 1970, Henry spent his long service leave tackling a course in experimental phonetics in the Speech and Language Research Centre of Macquarie University.

He has now been awarded a Master of Arts degree for his thesis "Rhythm in Spoken English", highlights of which were the construction of an electro-mechanical poetry appreciation machine and a mind-bending bodgie-beat (i.e. irregular) metronome.

Chemical Physics

Mr. A. F. Moodie of the Division of Chemical Physics, Melbourne, has been elected to the Fellowship of the Australian Academy of Science. The citation said Mr. Moodie had played an important part in the theoretical and experimental developments which had revolutionised the fields of electron diffraction and microscopy of crystals in recent years. It added that he had initiated the development of a number of new experimental techniques and methods in these fields and pioneered their application.

SAFETY NOTES

Swimming pool chemicals

A recent report in a Sydney newspaper disclosed that chlorine powder used for home swimming pools is being blamed for a dramatic increase in household poisoning and also for the initiation of explosions and fires because of incorrect use and storage. The usual powder contains about 70 per cent of calcium hypochlorite, which, if not stored in a cool, dry place, will generate chlorine, a poisonous gas, and oxygen which vigorously supports combustion.

Care should be taken with the powder, particularly by those who live in the south where partly used containers are left and forgotten during the winter months.

Hot foot

An unusual and serious accident occurred to a workman at an industrial site. He had been poisoning weeds with a sodium chlorate-base weed killer and his boots had become impregnated with the chlorate. Some days later a piece of hot welding slag ignited his boots which burned fiercely because of the chlorate, and caused severe burns to both feet.

With both the above chemicals, which are oxidising agents, fierceness of burning is accentuated. Keep them well away from combustibles.

J. Hallam, Safety Officer.

AROUND THE LIBRARY SHELVES

New recruit

The Central Library has a new recruit to its staff. She is attractive Ms Sonia Castro, who crossed the Pacific a year ago to take a look at Australia.

Sonia studied for her Diploma of Librarianship at the University of Chile and since then her career has included three years in the Central Library of the University of Chile, followed by nine years in the specialised library of the Forestry Institute.

She has travelled through a number of the countries within the American continent and in 1962 went to the United States taking part in "The Experiment in International Living", an American organisation which arranges visits from leaders and specialists in various fields from all over the world, with emphasis on friendship and understanding through home hospitality.

Later Sonia undertook a post-graduate course at the Brazilian Institute of Bibliography and Documentation in Rio de Janeiro and in 1970 attended a summer school at the North Carolina State University.

There was no organisation similar to CSIRO in Chile, but scientific research was carried out in the eight universities and institutes, she said. Libraries played an important role in their work and the National Library had 1.2 million volumes. The university libraries exchanged publications with most countries, including Australia.

"Many Australians seem to think that South America is full of Indians," she said. "And revolutions as well. Chile has a European background, but its culture and language are Spanish. As for the Indians . . . they are in about the same numbers as your Aborigines."

Sonia has quickly felt at home in Melbourne but says it has taken her time to get used to the Australian accent.

Meanwhile, she has not been slow to take on outside interests. She is already serving as a volunteer with the Australian Red Cross Society in the Blood Bank and Meals on Wheels.

Information explosion

Chemical Abstracts Service reports that in 1972 the chemical literature cited in "Chemical Abstracts" increased by 8.2 per cent over 1971.

The Biochemistry Sections which contained almost a third of CA Abstracts increased by only 6 per cent while the Macromolecular Sections which account for about 12 per cent of the citations increased by 35.9 per cent. Organic Chemistry grew by 10.4 per cent, Applied Chemistry and Chemical Engineering by 8.8 per cent and Physical and Analytical Chemistry by 1.4 per cent.

Surprisingly patents made up almost a quarter of Chemical Abstracts in 1972, an increase of 13.3 per cent over 1971. Almost half the patent literature came from West Germany, France and Japan, mainly because of publication of backlogs of unexamined or partially examined patent applications. However, the United States, with 25.3 per cent of citations, produced most of the patent literature.

Ms Sonia Castro

Half of the non-patent literature was produced by the United States (27.5 per cent) and USSR (23.5 per cent) but more than half (58 per cent) was published in English. Russian accounted for 22.4 per cent.

—C. Garrow,
Central Library
and Information
Services.

Architecture

In a world which has seen a tremendous growth in science and technology in the last 50 years,. the needs of scientists have become increasingly more complex and exacting. The planning of laboratory facilities in which they can carry out their research programmes has become an equally specialised field.

When Rex Ferguson graduated in architectural engineering from the University of Adelaide in 1931, he had some concept of what was involved in the building of research laboratories but it was only during the years to come that he was to appreciate how tremendously complicated was the subject if mistakes and defects were not to occur.

After his graduation, Rex Ferguson spent two years overseas and then in 1935 joined CSIRO as an assistant research officer to work on timber utilisation problems in the Division of Forest Products. A few years later he moved to Head Office to become CSIRO architect. He continued in this capacity until his retirement in 1970.

After almost a lifetime spent in designing and building research laboratories — he is now a consultant in this field — he has produced a book "Practical Laboratory Planning" (Applied Science Publishers Ltd., London). In this he has made his and CSIRO's experience available to all architects, scientists and laboratory managers in the belief that all concerned with the planning of academic and industrial laboratories should be more conversant with the diverse aspects of the subject.

The author has looked at the responsibility not just of the architect and builder, but of the client. He has discussed laboratory planning in depth, the design of the building, its fittings, services and fire and safety protections. Every chapter is well illustrated.

The book also includes descriptions and technical details of a number of CSIRO laboratories and those of scientific organisations overseas.

In his foreword, the Chairman, Dr. J. R. Price, writes that by the mid-1960s the Organization had accumulated considerable information and experience in relation to laboratory design and it was felt that this should be assembled in such a way that it was readily available to people both within CSIRO and outside. The Executive asked Mr. Ferguson to undertake the preparation of this work, incorporating CSIRO's experience in the field of design of laboratory buildings.

The publication of the book represents the completion of the assignment.—D.B.

Staff authors

Two members of the Division of Animal Physiology, George Alexander and Owen Williams, have recently edited a book entitled "The Pastoral Industries of Australia — Practice and Technology of Sheep and Cattle Production".

The book was prepared for publication at the time of the Third World Congress on Animal Production, held in May, to introduce visitors from overseas to the Australian pastoral industries.

Prepared by 29 specialists, 14 of whom were from the Division of Animal Physiology, and two from the Divisions of Animal Health and Food Research, it is the first comprehensive book to appear on the production of sheep and cattle under grazing conditions in Australia.

The chapters are organised into four sections. The first deals with the Australian environment and rural history, the second describes the grazing industries of the present day and the third dissects productivity into various components and examines the results of research in pasture improvement, nutrition, reproduction, genetics, behaviour, climatic effects, disease, and management economics. The final section deals with recent developments that will shape the industries in the future.

Although designed for a particular audience at the conference, the book will be of interest to students, research and extension workers, journalists and animal producers.

—A.J.

Farewell from Dairy Research

After 33 years service with CSIRO, Mr. Ted Pont has resigned. A member of the staff of the Dairy Research Laboratory of the Division of Food Research, Ted was given a farewell function at Highett when many friends and colleagues gathered to wish him a happy retirement and to make him a presentation.

After he graduated from the University of Sydney, Ted spent his early years as a dairy bacteriologist with the New South Wales Department of Agriculture. In 1940 he joined the Dairy Research Section of CSIRO and worked on bacterial problems of dairy products. Subsequently he undertook research into chemical aspects of butter storage and quality and his work in this field over many years resulted in major contributions to the understanding of the problems of butter quality.

In 1949 he was awarded the Gold Medal of the Australian Society of Dairy Technology. In recent years Ted has been mainly engaged in investigation and development of concentrated cheese starter cultures.

Bug eyes and Cypriot happy

By training and inclination, Cypriot-born Ayis Ioannides is a neurophysiologist with a specialist knowledge in the physiology of the eyes of insects. As the new information officer of the Division of Entomology he is happy to spend his professional time surrounded by scientists and the world of insects.

After work, however, he likes to completely tune out on the subject of science and turn to his music.

Ayis is deeply interested in science, but, as he says, for him scientific research requires total dedication of time and mental effort.

He loves music but it is not his professional occupation. As a research scientist he could not find enough time to do what he wanted in this field so the thing to do was to compromise and find an occupation that would allow him to enjoy both. When the position of information officer at Entomology became vacant he felt he had the answer.

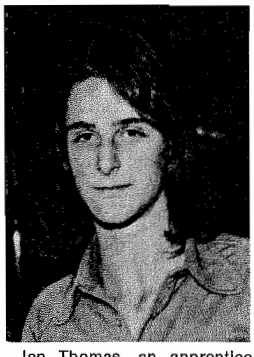
Now when working hours are over, he can don his formal attire of evening suit, white shirt and bow tie and conduct the Canberra Choral Society at one of its performances in the national capital without qualms of conscience that he should be home studying.

He can also give more hours than he has done in the last year or so to directing the music of the Canberra Opera Society and to indulging in his interest of playing the piano, harpsichord and organ.

Ayis has lived for three years in Australia but before that spent 10 years in Britain where he was research assistant to Dr. G. A. Horridge at the Gatty Marine Laboratory, part of the University of St. Andrew's in Scotland. When Dr. Horridge was invited to establish the new Department of Neurobiology as part of the Research Group of Biological Sciences at the Australian National University, Ayis came with him on an ANU research scholarship.

For the last three years he has been working on his Ph.D. taking for the subject of his thesis the compound eye of an insect.

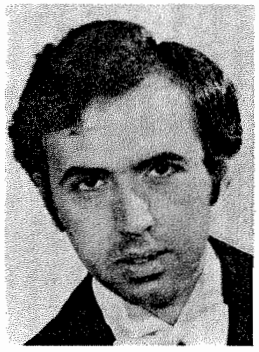
Rewards



Ian Thomas, an apprentice with the Division of Applied Chemistry, Fishermen's Bend, has won first prize for Production Engineering Grade 2 conducted at the Preston Institute of Technology. Ian collected a prize of $30 which was donated by a local Preston firm for his efforts.

Nineteen-year-old Pat Travers, who has been an apprentice scientific instrument maker with the Division of Plant Industry since 1971, has been winning awards lately. He took first place in the ACT for overall performance throughout 1972 for Stage 2 of his fitting and machining course, the NSW Department of Education placed him second in his course, and he took second place in NSW for the Purcell Engineering Company's award.

baton(s) keep



Ayis Ioannides

Building Research Flies Kites

The Division of Building Research at Highett has been doing some kite flying lately — literally, that is.

The Social Club organised a kite flying competition and all reports confirm a successful venture. There was a stiff (and cold) breeze blowing but more than a dozen kites took to the air.

Triangles, birds, including one that flapped its wings, a double fish and a 5-ft. box kite, all in attractive colours, soared and swooped during the lunch-hour competition to decide the most efficient (steepest string angle) kite.

To the delight of the club, scores of children from a nearby school were taken by their teachers to the edge of the "flying field" to enjoy the sight. Their laughter at the gyrations of one of the bird kites was an unexpected bonus for the organisers. The prize-winning entry was made and flown by Ms Helen Kenna.

Chess Title

The Division of Protein Chemistry in Melbourne retained the chess title it won earlier this year when it played a match against representatives from the Forest Products Laboratory. Thirteen games were played with a final score of 8-4 and 1 game drawn.

The highlight of the night was the battle between two old rivals, Wal Savige and Huntley Higgins. When the night watchman turned out the lights, long after everyone else had gone home. Wal and Huntley agreed on a draw.

Cannibal — a gastronome of the old school who preserves the simple tastes and adheres to the natural diet of the pre-pork period.

—Ambrose Bierce.

Letters to the Editor

Animal Production Conference

Sir—

The Third World Conference on Animal Production held in Melbourne was a disappointment to me.

The urgent need to feed the world's millions was evident enough. Few speakers saw the human population problem as anything other than inevitable, but the Conference completely failed to come to grips with it.

It was depressing to hear delegates from the developed countries talk enthusiastically of future increases in their meat consumption. Supplies of meat and/or feed concentrates are to come from Australia or worse still, from underdeveloped countries where under-nutrition will be on the increase. Increasing numbers of people in affluent countries are already eating themselves into an early grave. Hopefully the United States will not be able to afford this in view of her balance of payments problems and prospective large fuel bills.

A paper by Professor McClymont, Armidale, commented on the precarious nature of our present agricultural practices. Many projects are now dependant on alarmingly large inputs of energy derived from our dwindling stocks of fossil fuels. The free-ranging animal grazing on otherwise useless land was a more likely prospect than energy-consuming feed-lotting. The Green Revolution being very energy dependant might have a doubtful future, too.

The Green Revolution also came under fire from an Indian delegate who drew attention to the problem of rural unemployment it was creating.

Several speakers saw a conflict between animal production and conservation/recreation. A Kenyan delegate felt conservation of wild animals was impracticable in the long term because the human population explosion would eventually force man to use all land for his own needs.

Wildlife

South African scientists produced an impressive amount of information on their wildlife, thus showing up a deplorable lack of Australian data on kangaroos. The only paper on kangaroos came from CSIRO (Alice Springs), ironically enough from a Canadian couple. Lack of competition between the kangaroo and beef cattle was demonstrated. The Queensland Department of Primary Industries, who seems to hold opposing views, was unfortunately not represented, so that a meaningful discussion of Queensland Government policies could not be held.

Professor Heady, U.S.A., provided a fascinating colour-slide show of multiple recreational uses of American rangelands. The fragile nature of this environment was evident from the persistence of army tank trails dating back to World War II. Encroachment by present-day "bikies" for their legitimate recreational needs helped to underline the detrimental features of overpopulation in affluent societies.

Many of the overseas visitors were senior administrators who had over the years acquired distinction in their fields. It was perhaps unfortunate that their younger and possibly more active and forward-looking colleagues could not attend as well. This defect was particularly evident in the session devoted to the Future of Animal Production which called for provocative and imaginative proposals.

Can we expect any better from the next conference in Argentina in 1978? Perhaps we should not be too optimistic seeing that a recent article in "Science" describes agricultural scientists as the most conservative of all academics.

—Peter Springell,
Animal Genetics,
Rockhampton.

That label again

Sir—

I agree strongly with your other correspondents that "Mistress" would be the most desirable pronunciation for Ms. For the past year I've been discussing the idea of Mistress as a title for all women, married and single, with women I know. Almost all, including those who have actively adopted Ms as a title, prefer Mistress to "Mzz" and none like it less. Several of us feel strongly enough about it to have begun using it in correspondence. A few have been worried about the connotation of "kept woman" but most of us feel people will forget that very soon. Who remembers it when talking about a school head mistress, for example? The basic meaning is excellent, and as an equivalent of Mister, Mistress seems far more suitable than a meaningless noise.

—Jennifer V. Parkhurst,
60 Glen Street,
Aspendale, Vic.

Sir—

In reply to your editorial question how to spell Mrs in full—Mrs is a 17th century abbreviation of mistress (OED). If, as you say, Ms is a hybrid of Miss (an unmarried woman) and Mrs (a mistress), then presumably Ms is an elderly, unmarried, half-caste mistress.

Is this perhaps relevant to the problem of whether an abandoned woman can also be kept?

—Robin Austin,
Division of
Fisheries and
Oceanography,
Cronulla.

Sir—

Now that you have helped with the pronunciation of this new label, please tell us more about "women's lib". Is it absolutely necessary to refrain from loudly proclaiming to the world a chosen life-style in this quest for liberation? Must we embrace a title that proclaims only anonymity as do our men? After we relinquish our identities, what must we next lose in order to be truly liberated?

—(Mrs.) P. Castle,
(Miss) C. Hauser,
Regional Office,
Melbourne.

P.S.: What's so different about a Chief's wife (May Coresearch). Can we retain our identities if we live with a Chief?

(The gremlins that haunt every journalist and printery are obviously against women's lib. and interfered with the type in the dark of night, as is their habit.—Ed.)

Communication

Sir—

In the May issue of "Coresearch" there were two feature items of major importance under relevant headings on the front page.

Under "Better Communication Vital" you present a review of the Chairman's remarks to more than 70 officers representing 32 Divisions in residence at the Australian National University. The Chairman's remarks are highly commendable and directly related to problems now worrying most of our staff. The need to create a public image is clearly apparent and the need for better internal communication has become an increasing problem since CSIR became CSIRO. Regrettably there is no suggestion as to how these entirely desirable links can be improved or established.

Under "Land Research Reorganised" you report on the recent establishment of three new Divisions whose functions, I quote, are—

- To survey land resources, assess their potential and develop new research techniques.
- To develop management techniques for achieving optimum productivity consistent with conservation of the resource.
- To study soils, including their management for crop, pasture and forest production as well as other effects of man's activities on soils.

I must confess that I find the distinction between the work of these three Divisions, to say the least of it, somewhat confusing, while attempts to envisage how this fractionation will encourage internal communication is quite beyond my comprehension.

Effective liaison, or what was described by Dr. A. C. D. Rivett as "cross-fertilisation", will best be achieved when scientists from different disciplines can work in concert on a common problem and in co-operation with the man on the land. It has little to do with administration, or the creation of new and self-centred Divisions, whose functions in fact are not clearly defined, unrelated to any specific science and separated by the width of the continent.

A reference which is peculiarly relevant has been attributed to Gaius Petronius, AD 66—

"We trained hard—but it seemed that every time we were beginning to form up into teams, we would be re-organised. I was to learn later in life that we tend to meet any new situation by re-organising, and a wonderful method it can be for creating the illusion of progress while producing confusion, inefficiency and demoralisation."

—T. B. Paltridge,
Division of Soils,
Adelaide.

Presentation

A retired Chief of the former Division of Food Preservation, Dr. J. R. Vickery, was presented with the James Harrison Memorial Medal at a refrigeration conference in Sydney last month.

Dr. Helen Newton Turner

Cont'd from page 2

With no thought of slowing her pace, last month Helen Newton Turner was struggling with a new problem . . . how to get to Beirut in November in time to do her work for the Ford Foundation, cross over Africa and reach South America in time to attend a sheep breeding conference being held at an altitude of 10,000 feet in the Andes in Peru.

And as if that weren't enough, she was saying: "But I still want to get back to Australia, you see, in time for another sheep breeding conference here. . . ."

Indigestible

An aviation enthusiast describing his travels in Australia for "Air-Britain Digest" was vividly impressed with the wide variety of aircraft he saw around airfields all over the country. At Mascot, he writes, "the domestic terminal areas, in addition to the Ansett, TAA and East West Airlines' aircraft, contained a trio of DC3s — VH-PWM of East West, VH-ANR still in airlines of New South Wales colours, and VH-RRA of CSIRO (apparently a local radio station)."

ATTENTION FIELD WORKERS

Make Notes! Don't Commit it to Memory

—And so a desert worker (who shall remain nameless) from the Division of Land Use Research, grabs a quiet moment to follow instructions.

Busman's Holiday

Two of CSIRO's experts in the visual field are combining overseas tours planned for their long service leave with assignments in Europe. They are Stan Evans, Officer-in-Charge of the Film Unit, Melbourne, and Ed Slater, photographer for the Division of Wildlife Research, Canberra.

Stan's itinerary will take him to both the United States and Europe and has been arranged so that he will be in Bulgaria for the 27th Congress of the International Scientific Film Association in October where he will represent the Organization. This will be the third time Stan has had this honour—he was present in 1956 and 1966.

He will also investigate new developments in film making and will look at the latest techniques in the audio visual field being used as means of communication between scientists, between scientists and industry and between scientists and the public.

One of Ed Slater's main interests will be to organise an exhibition of Australian wildlife and the environment. This will be staged at a later date in London, possibly at Australia House. In addition he plans to examine and photograph all the illustrated material relating to Australian natural history housed in the British Museum, including that of Cook's two voyages, and collections made at the time of the "first fleet" in 1788.

This project is part of an overall plan to obtain as complete a collection as possible from all sources outside Australia for subsequent study and research.

It is hoped that eventually there will be a wide distribution of the material in the libraries of Australasia where it will be readily available for study or reference.

Ed has been invited to visit West Germany by E. Leitz Wetzlar, manufacturers of optical scientific equipment and cameras, and will talk to them on Australian wildlife and screen the film, "The Birth of the Red Kangaroo".

Precedent?

The Swiss Government is reported to be asking unmarried women civil servants if they would prefer to be called "Frau" (Mrs) instead of "Fraulein" (Miss), in the belief that many of them feel the word "Fraulein" (literally "little woman") sounds inferior.

Solar Energy

Cont'd from page 1

to understand what was happening within the Organization along these lines and this could be most helpful to them in their own paths of research.

Following on the interest that was created by the conference, the Division of Mechanical Engineering received a number of media visitors at its Griffith field station. These included a TV film unit from the ABC, representatives from the "Sydney Morning Herald" and the Australian Information Service, CSIRO's film unit and Coresearch.

Mr. Morse, Dr. David Proctor and Mr. Tad Czarnecki, all from the Division's headquarters at Highett, joined their field representative, Mr. Graeme Flood, for the occasion.

Printed by CSIRO, Melbourne

coresearch

For circulation among members of CSIRO staff

August 1973

171

Scientists Converge on Perth for ANZAAS

More than 3500 scientists, academics and other visitors will be in Perth this month for the 45th Congress of the Australian and New Zealand Association for the Advancement of Science. They will come from 19 different countries.

A number of CSIRO staff will either be convenors of sessions or will be giving papers, while this year's presidential address will be given by Emeritus Professor Eric J. Underwood, a member of the Executive.

Professor Underwood,. who retired in 1970 from his position as Dean of the Faculty of Agriculture at the University of Western Australia, will speak on science, development and the environment. He is a man with a strong background in agricultural research and early in his career gained world-wide recognition in scientific circles for his work on animal nutrition and animal husbandry. He was also a pioneer of work on trace elements.

Recently Professor Underwood completed an extensive review of the agricultural research activities of CSIRO, a project he undertook at the Executive's request.

Speaking about ANZAAS, Professor Underwood said it had two main aims: "One is to bring together scientists of all types and occupations so that they can exchange ideas and information. The other is to make the public aware of what science is, what scientists do, and of the applications and implications of scientific discoveries to their own everyday affairs and those of the nation."

Professor Eric J. Underwood.

A number of specialist and affiliated societies will meet in Perth either before or after the congress and then, for the first time, after the main conference 55 delegates will go on to Singapore for three days' discussions on science and development. This part of the programme has been arranged with the Singapore National Academy of Science.

A student ANZAAS will also be held in Perth along with the main congress workings.

And as it was in the good old days

The Australasian Association for the Advancement of Science, the forerunner of ANZAAS, was first held in Sydney in August 1888. For a review of that meeting please turn to page 4.

BIRD BANDERS HELP SCIENTISTS IN THEIR WILDLIFE RESEARCH

"If it flies, we'll band it."

That's the way David Purchase describes the Australian Bird Banding Scheme which during 1971-72 banded nearly 79,500 birds covering 405 species. As well, more than 13,000 recoveries of 250 species were made.

David, who is the official secretary of the scheme, might well have added that members will band birds that don't fly — emus and penguins—and further, they will band things that fly that aren't birds — bats, for instance.

There are a number of bird banding associations in Australia but by far the largest is the CSIRO one operated by David from the Division of Wildlife Research in Canberra. Working in collaboration with State fauna associations, it has about 350 members, 40 of whom are professional ornithologists.

Since its inception in 1953 the scheme has been responsible for the banding of more than 1,000,000 birds and more than 90,000 have so far been recovered.

"The scheme was launched to stimulate a wider interest in bird banding," David said, " and at the same time provide a national centre which would co-ordinate the work.

"We will supply bands and other equipment to members but we don't regard the operation as being a matter of someone catching a bird, banding it and thinking he has done his bit for science. It's much more than that.

"We think of banding as being a tool that's used to carry out a specific bird study, but by that we don't mean everyone has to be a professional. Members can be housewives or biologists — just so long as they have a definite reason for their work.

"Sometimes it is just an enthusiast who would like to know how many silver eyes he is getting in his back garden now that he has established trees and shrubs there. Fair enough. It could be useful information in a population or migration study.

"And by the same token, the person applying for equipment might be a biologist going to the Antarctic or Macquarie Island with an ANARE team who wants to carry out a study on penguins. At Macquarie Island for instance, there are about half a million royal penguins making a rock-to-rock carpet across the world's largest single rookery. Their habits are of great interest to many scientists."

Then there are CSIRO's own programmes which involve studies on birds such as the cormorants, wedge-tailed eagles, pigeons, muttonbirds and quails, as well as waterfowl.

"Often scientific groups are supported by amateurs. Take the Albatross Study Group that has been working along the coast of New South Wales," David said. "Their work has been most useful and they have recorded recoveries of wandering albatrosses banded on South Georgia by the British Antarctic Survey, from Macquarie, Auckland and Kerguelen Islands. This has helped considerably to establish accurate flight pictures of the ways these huge birds traverse enormous distances." (One early Australian record shows an albatross flew 3027 miles in 46 days, from the Crozet Islands to Triggs Island in Western Australia.)

An example of how bird banding can be of use in collecting scientific data on bird migrations was the study made in the 1950s by Dr D. L. Serventy when he built up an accurate flight schedule of muttonbirds. This proved that birds from the Bass Strait islands and Victoria make a giant figure-of-eight cycle from their Australian breeding grounds northwards to the waters near Japan, Korea, Alaska and Canada and then return southwards.

The flights of another international wanderer, the giant petrel, have also been monitored by banders, filling in blanks in the work that is being done on seabirds.

Similarly, banding has revealed that the young straw-necked ibis and white ibis will disperse widely from their breeding colonies and movements of 1500 miles have been recorded. Without proof by the banding scheme, few would have believed that the birds could have travelled those distances.

For David, one of the most exciting aspects of his work is never quite knowing what each notification will mean. In one day he could receive word of birds being sighted in Korea, New Zealand or Papua New Guinea. He could have a request from a scientist in Sabah asking for permission to use CSIRO bands for a project he is involved in in Malaysia or it could be that a housewife in Canberra has found a banded bird from Adelaide.

What he also finds equally pleasing is the enthusiasm that is so often shown by amateurs. "Many will give up a lot of their spare time and don't mind great inconvenience to achieve their objects," he said.

"One group in Canberra thinks nothing of getting up at 3.00 a.m. on a Sunday to drive 40 miles up into the Brindabellas to get their mist nets up before dawn. They've been doing this for years and as a result have built up a good knowledge of the birds in those ranges. It could be very useful to have this data at some time."

David Purchase, official secretary of CSIRO's bird banding scheme.

Nine-day fortnight for trial

A nine-day fortnight will be introduced soon at the Divisions of Building Research at their laboratories at Highett and South Melbourne and at Applied Chemistry, also in South Melbourne.

Staff in these laboratories will take part in a pilot scheme for six months during which time the experiment will be assessed from the point of view of the practicability of a flexible working week, and its effect on staff travel problems, safety statistics, absenteeism, sick leave, productivity and overtime.

The scheme was announced last month by the Chairman, Dr J. R. Price, who said that its introduction would give CSIRO a chance to gauge the merits of a system of working hours which would give more recognition to the needs of the individual worker.

In the nine-day fortnight working time will be adjusted to allow rostered groups to be off duty one Monday or Friday each fortnight. Under this system workers will have a three-day weekend every fortnight. The actual number of hours worked over the fortnight, however, will continue to be 73½ hours as at present.

Surveys will be carried out before, during and after trials to ascertain staff attitudes to the total working situation. When the scheme was first announced a large majority of the staffs concerned voted in favour of the experiment.

This is the first time that the nine-day fortnight idea has been introduced in the government sector of Australia.

More money for homes

The maximum amount which can now be borrowed through the CSIRO Co-operative Credit Society has been increased from $8000 to $12,500.

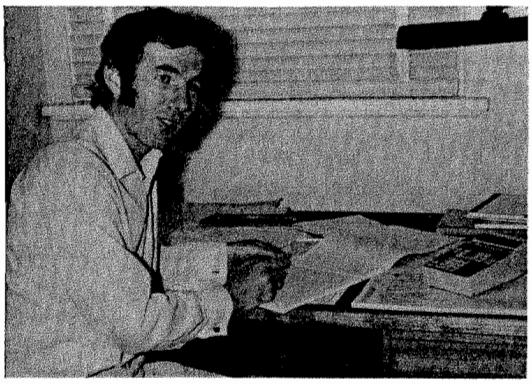
The decision to increase the amount of the loan was taken at a recent special meeting of the society when members resolved to amend the Rules of the society to that effect.

Approval has now been given by the Registrar of Co-operative Societies to this proposed amendment to the Rules.

It is envisaged that loans of this amount will be solely for the purpose of house purchase or house building and will require security satisfactory to the Directors before such a loan application is approved.

This will probably have to be in the form of a first or second mortgage.

The term of the loan will probably not exceed 15 years. The interest rate will be the same as before — 7.8 per cent reducing quarterly.



TIDES EXPERT LEAVES

In the four years Dr David Webb (above) spent with the Division of Fisheries and Oceanography at Cronulla, he covered thousands of miles of Australia's coastline — most of them from his desk at Cronulla.

A theoretical physicist, David came to CSIRO from England on a contract to work for the Division on the Northern Prawn Project. His brief was to study the tides of the survey area which extended from the waters of South Queensland around the north of Australia to Nickol Bay in Western Australia and in the Gulf of Carpentaria.

Having completed his last calculations on that project and many others he became interested in, David left Sydney recently on his return to England, leaving Australia considerably wiser about the effects of the tides of its coastline and the currents of its surrounding oceans.

David was first recruited to CSIRO after he had completed his Ph.D. in theoretical physics at the University of Manchester. He spent the next 12 months on a CSIRO post-doctoral fellowship at Cambridge studying oceanography and working with the Department of Applied Mathematics and Theoretical Physics.

"That was where I discovered that oceanography in England is dominated by Australians," he said. "In that department alone, I worked with three of them, all distinguished men in their field —Dr Adrian Gill, Professor George Bachelor and Dr Stuart Turner."

At Cronulla, David's first assignment was the prawn survey. "Tides appeared to have an effect on the biology and behaviour of the prawns and it was thought that the tidal currents could be the means of transporting larvae and adult prawns in their migrations."

A computer simulated model of the workings of the tides in the Gulf was made and from this the currents generated by them were calculated. "Out of this work I became interested in tidal theory. I wanted to have a better understanding of the way tidal energy flows through the ocean and how this energy is affected by resonances.

"A long wave whose crest is the high tide and whose trough is the low tide, moves eastwards from the Indian Ocean and through the Timor Sea, across the continental shelf area between Papua New Guinea and Australia and then down into the Gulf. It circulates there until it dissipates. The area is unique — about 15 per cent of the world's tidal energy is lost in that part of Australia."

David also investigated what forces control tides around Australia and how better tidal predictions could be made available. "Our ability to do this has come about as a result of new techniques developed through studies of nuclear physics," he added.

Similarly, he became interested in moonlight predictions, a study which will help biologists in their investigations of the behavioural patterns of both rock lobsters and prawns.

At the end of four years in Australia David began to feel he should return to England and the decision was confirmed when he was awarded a Royal Society scholarship to work at the Institute of Oceanography and Tides at Liverpool.

SAFETY NOTES

An eye conservation programme

Do you use power tools at home? If so I expect they are kept in safe working order and you take commonsense precautions when using them — precautions such as switching off and unplugging the power cord before making adjustments and always using the guards provided.

But what about eye protection? Have you ever given it a thought? Probably not, because it is something which is neglected by most of those in the do-it-yourself field.

It should not be. Particles thrown off by power cutting or abrading tools such as saws, drills, sanders and grinders can inflict serious eye injuries. My advice is to invest in some good quality safety spectacles or goggles for the home workshop and to wear them whenever using tools of this type. This way you will be able to keep both eyes on the job.

While on the subject of home workshops and eye protection, I should mention arc welding. As the son of a staff member recently discovered, even momentary exposure to the intense light generated by a welding arc can produce a painful conjunctivitis.

A shield or helmet with a tinted filter must always be used by the welder and any helpers. Special care should be taken to avoid striking an arc when the eyes are unprotected — for example, when adjusting the work with the shield raised to obtain a better view.

—Gil Barnes, Safety Officer.

Griffith lab has rose "museum"

Ever since history has been recorded there have been references to roses and the surprising thing about it all is that the roses named in the legends have survived in their original species over not just hundreds of years, but over thousands.

Two people in CSIRO who have taken a special interest in these original species are the Chief of the Division of Irrigation Research at Griffith, Mr E. R. Hoare, and the Division's gardener, Mr Bob Dalgleish. A partnership which began between these two men 11 years ago when Bob first joined the staff, has resulted not just in the laboratories having an award-winning garden — it has won many competitions — but in their having a rose "museum" which has aroused much interest among both staff and visitors.

From early summer through to almost the middle of winter, the rose gardens are filled with delicate blooms of pink and white, crimson and bluish-purples. Petals which grow straight or crimped are set against moss green foliage and whether single or double, the flowers possess the heady perfume which has always been associated with old-fashioned roses.

Rose "museum"

Walking around the gardens with Bob is like taking a step back into the pages of history, for as he will tell you, in the olden days it was nothing for a sultan to load 500 camels with rose water and make a trek across the desert to purify some ancient temple which might have been recaptured by Arabs from Christian invaders.

Emperors of a bygone era would command their slaves to strew the paths of important personages with petals. From North Africa the Moors took their roses across to Spain and when the Spaniards invaded the New World they took their roses with them.

Phoenician and Greek traders gathered the blooms from the gardens of Asia Minor and carried them to Morocco for the great perfume industries which flourish to this day and the Romans introduced many varieties into England.

Medicines

In the early days France was a great rose-growing centre and in the time of Napoleon nearly every second shop in the town of Provins was owned by an apothecary. "These men did a flourishing business in the preparation of rose petals for medicinal purposes and their products were said to be sure cures for indigestion, debility, throat and skin infections and eye problems," Bob said.

"In the 13th century Edmund, Earl of Lancaster, was sent to Provins to quell a revolt against the King of France. While he was there, Edmund fell in love with a local rose — the botanical kind — called *R. gallica* When he returned to England he took the red Rose of Provins, as it was known, with him and it became the inspiration for the emblem of the House of Lancaster.

"On the other hand, the House of York was inspired by an equally lovely white rose, *R. alba*, which grew around the roadside hedges of old England. Later the white rose of York and the red rose of Lancaster were combined to form the Tudor rose, the emblem of the Royal House of England."

Legend

There is also a striped Damask hybrid which has red splashed on to white petals, botanically called *R. damascena versicolor*, around which many legends have grown up. "It's said that the Lancastrians and Yorkists had their brawl which precipitated the War of the Roses around a bush of versicolor which was then growing in the Temple Gardens," Bob said.

The Griffith "museum" has examples of each of these varieties which are still growing just as they did so many years ago.

"Damask roses, of course, go right back into antiquity," Bob said. "Four thousand years ago a Minoan artist painted one of them on to a fresco and a vase which decorated the ancient palace of Knossos on Crete. Excavations carried out as late as 1926 revealed the treasures and experts clearly identified the species."

Among Bob's favourites are *R. centifolia* or the cabbage rose and *R. foetida bicolor* or the Austrian copper briar. The latter is said to be the forerunner of the modern roses which have since given us the beautiful orange and yellow tonings. "Before that — up to 1590 — most roses were pink and white with a few crimsons and scarlets among them.

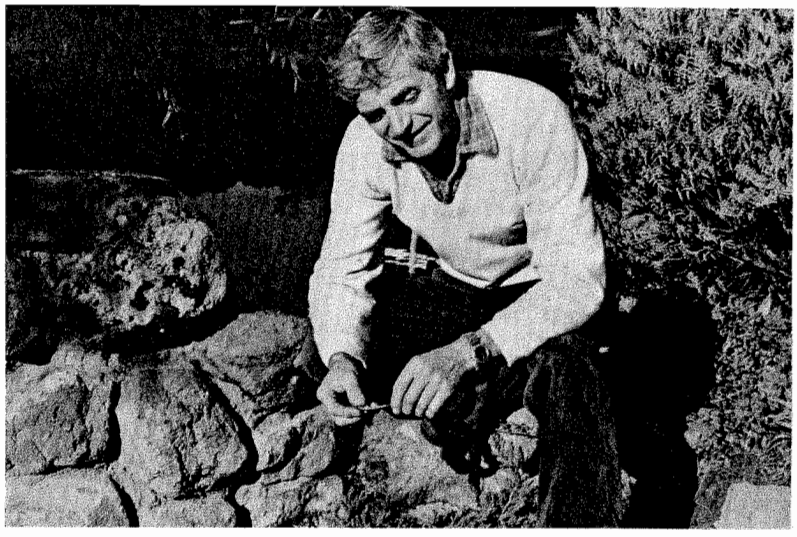
Artists

"*R. centifolia* is the rose that was so often used by the early masters in their paintings and it still takes pride of place in many gardens," Bob said.

"About the only time roses seem to have been out of favour was during the early days of Christianity," Bob said. "They were frowned on then because of their association with Roman paganism. Gradually, however, the flower was accepted again and even became used in religious ceremonial. The rosary beads, originally made from rose hips, became of particular significance to Catholics."

The stories Bob and Eric Hoare between them can tell about the roses are a legend. They are happy to share their interest in the roses with other Divisions though, and as Bob said, "If any other Division would like to establish a similar museum, I'd be happy to propagate cuttings for them."

While roses are a major interest for Bob, the rest of the gardens are not neglected for them. Each year, in consultation with Mr Hoare, he adds some new feature to the grounds. Date palms, one of the plant breeding projects in the 1930s, are now growing in the spacious lawns and have rock gardens under them. A shady corner has been built round a fish and lily pond and in 1970 to mark the bi-centenary of Cook, a garden feature was formed around Callistemon *viminalis Captain Cook*.



Bob Dalgleish relaxes in the gardens at Griffith.

Appointment

Dr R. J. Rose has joined the Division of Horticultural Research, Adelaide. Dr Rose gained a B.Sc. (Agr.) from Sydney University in 1964. After two years with the New South Wales Department of Agriculture at Alstonville he undertook studies on the physiology of elongation and division in plant cells at Macquarie University and was awarded a Ph.D. in 1969.

During the tenure of a CSIRO post-doctoral fellowship in 1970, Dr Rose worked at Carleton University, Ottawa. He comes to the Division from a lectureship at Massey University, New Zealand.

London: Scientists studying the effect of wind on buildings found the roof of their research station had been blown away by a freak wind.

Ian Munro to complete work on fishes book

A grant of $12,845 from the Fishing Industries Research Trust will allow Mr Ian Munro of the Division of Fisheries and Oceanography to complete work begun nearly 20 years ago on a book of Australian fishes.

The money has been given to the Division to allow them to employ a research scientist to assist Ian with the preparation of the material. The book will be similar to the ones he has already produced on the fishes of Papua New Guinea and Ceylon.

Ian's interest in doing this work was started not so much as a special assignment from the Division but rather because the then Chief, Dr Harold Thompson, encouraged his staff to take up some sort of hobby that was related to their work but not necessarily included in their formal duties.

"I decided to look at fish eggs and larvae and spent a lot of my own time as well as the Division's on it. But I soon ran into a problem . . . I realised there was no book on Australian fishes and before I could hope to identify the larvae I had to know something about the adult fish.

"I started building up information on these and then in 1956 the Commonwealth Department of Primary Industry thought it would be a sound idea to publish the work in a series of 'centre spreads' in the 'Australian Fisheries Newsletter' (now 'Australian Fisheries').

"This was begun but because of different pressures of work, had a rather eratic life cycle. We reached the forty-second part and then had to abandon the project."

The compilation of such a complex book is not new to Ian. Earlier he was asked by the Department of Agriculture, Stock and Fisheries (DASF) in Port Moresby to work on the production of a book on the fisheries of Papua New Guinea, and in 1951 he was the recipient of one of the first Colombo Plan grants to go to Ceylon to gather material for a similar book on the freshwater and marine fishes of that country.

The Ceylon book was eventually published in 1955 and the PNG one in 1967.

In the middle of his preparation of the Australian book, Ian was assigned to the Gulf Prawn Survey, a research programme which eventually gave Australia a multi-million dollar industry. Although the field work was completed on that study some years ago, the writing up of the survey results in still continuing and much of this work has fallen to Ian.

"But I always wanted to complete the work on the Australian fishes and now with this grant we will be able to finish gathering the material. When the scientist is appointed we will visit each of the State museums and a lot of work will also be done at the Australian Museum here in Sydney. I imagine that it will take three years for the preparation. After that we'll start talking about its publication."

In the meantime more of Ian's work has appeared in a special supplement of "Impulse", a journal published by Winthrop, a subsidiary of Sterling Pharmaceuticals Pty Ltd.

The company is publishing a series on venomous Australian plants, fish and animals and the two features on venomous and poisonous fish, their identification, symptoms and treatments, have been specially prepared for Winthrop by Dr R. V. Southcott.

They are based on the text to be used in "The Neurological Effects of Noxious Marine Creatures" which is to be published shortly. Ian has been responsible for the illustrations of fishes, rays and eels.

Mr Ian Munro at work in his laboratory at Cronulla.

Dr Lennox for London

When Dr F. G. Lennox (below), Chief of the Division of Protein Chemistry, of the Wool Research Laboratories Group, takes up his appointment in London next month as Chief Scientific Liaison Officer, he will investigate a number of matters which are of interest to the Executive and various Divisions he has visited in the last two months.

Among these is the growing awareness of the role social scientists can play in research being undertaken by CSIRO.

Dr. F. G. Lennox

"There's considerable interest in this field, but as yet some of our staff are cautious. They would like to know more of the ways such scientists are being used in overseas scientific organisations, particularly in the areas of urban planning and land use," Dr Lennox said.

While he is in London, Dr Lennox will have specific duties to perform but for much of the time he will be free to follow those pursuits which will be of greatest interest to the Organization or his own field of research, the industrial utilisation of protein materials.

"I also want to look at environmental science," he said, "because this is of special concern at the moment to CSIRO."

Dr Lennox's appointment is a break-away from tradition in that instead of spending the customary 18 months overseas, his term will be for three years with a familiarisation tour back to Australia mid-way through the period.

His departure will make him missed in many areas both inside and outside CSIRO which he has served since 1936. He has been Deputy Chancellor of Monash University for the last five years and is closely associated with the Victoria Institute of Colleges, just to start with.

Dr Lennox will be accompanied by his wife, Fran, a botanist. "I'm hoping she'll be able to help me in many ways, especially with a project I hope to start. . . . I would like to establish some Australian plants at ASLO," he said.

Off duty, Dr Lennox is planning to indulge in his interest in music. A violinist, he has played with various string groups over the years and during a recent trip to London picked up a "fairly valuable" instrument at Sotheby's.

When he leaves Parkville the Assistant Chief, Dr W. G. Crewther, will look after the Division until a new Chief is appointed.

SOME LIKE IT HOT . . .

A project to determine whether there is a difference in the temperatures in which Melanesians and Europeans prefer to live in their homes is being undertaken by the Papua New Guinea branch office of the Division of Building Research.

The data collected from the survey should provide useful information to architects and the building industry in Papua New Guinea.

The Environmental Assessment Project is part of the work being carried out into different aspects of tropical building, especially in Papua New Guinea, by the branch which was established in Moresby more than 10 years ago. Other programmes it has undertaken include the collection of solar radiation data and problems of algae on concrete buildings in the tropics. The branch also provides an information service on building research.

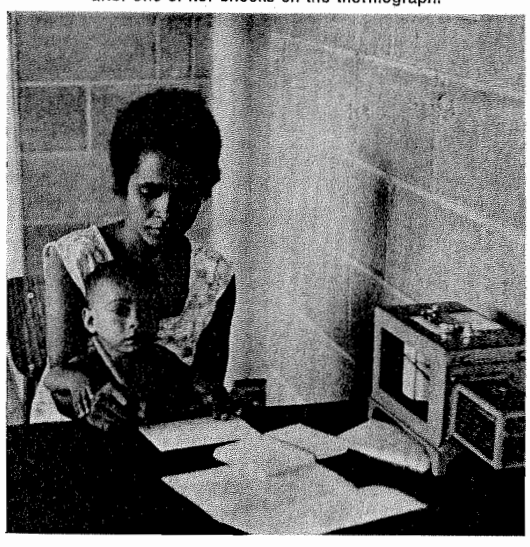
Mr. Ken Biggs of the Building Practices Group of the Division, has returned to Highett after a six months term in Moresby where he was the resident officer and in charge of the project. Fourteen homes of three different types of construction and all occupied by Melanesians had had thermographs installed in them in the same way as had homes of a similar group of Europeans in an earlier part of the survey, he said.

The occupants were asked to fill in assessment cards four times a day during November 1972 and February 1973. A further survey will be undertaken this month. During these months Moresby typically experiences three distinct types of weather — the hot, dry doldrums, the wet monsoon, and the cool, dry south-east trade winds.

The same assessment cards were also filled in by the European occupants of a further eight homes as a control to link with earlier results.

The resident officer of the branch visits the 22 homes each week during the survey, Ken said, collects cards, changes the thermograph charts and discusses the progress of the survey with the family so that a good liaison is built up between them.

Ms Maud Diala, one of the Melanesians co-operating in the Environmental Assessment Project in Moresby, fills in her card after one of her checks on the thermograph.



Staff advise on wildlife publication

A new encyclopedia on Australian flora and fauna, called "Australia's Wildlife Heritage", published by Paul Hamlyn, made its appearance in newsagents and bookshops last month.

The project is a 70 cents-a-week method of obtaining a series which is designed to make Australians aware of the urgent need for conservation of plants, animals and birds in their own country.

The series will contain 3360 pages of material, including 5000 illustrations and has a foreword by the Duke of Edinburgh in his capacity as President of the Australian Conservation Foundation. It was launched by the Prime Minister, Mr. Whitlam, and endorsed commercially by Mrs Whitlam (funds to go to the Foundation). A percentage of the profits is to be donated by the publishers to selected national and State conservation societies.

The authors of the work are Vincent Serventy and Robert Raymond, two of Australia's best-known naturalists.

An Editorial Advisory Board was set up for the project which is chaired by Sir Macfarlane Burnet. The membership of the board is made up of a group of distinguished Australian scientists and several CSIRO personalities are included. They are:

- Dr Nancy Burbidge who until last month was the Curator of the Herbarium Australiense (Division of Plant Industry), who has lived in Canberra since 1946 following earlier research work in Western and South Australia. She is the author of three books on Australian grasses and has written several booklets on plants found in the vicinity of the ACT.
- Dr D. F. Waterhouse, Chief of the Division of Entomology, who is also Chairman of the Council of the Canberra College of Advanced Education and was President of the 14th International Congress of Entomology. Recently awarded the 1973 Farrer Medal, Dr Waterhouse has just returned to Canberra from a FAO conference on the resistance of insects to pesticides, held in Rome.
- Dr L. J. Webb of the Rain Forest Section of the Division of Plant Industry who is Vice-President of the Wildlife Preservation Society of Queensland and a Councillor of the Australian Conservation Foundation. He was chief editor of "The Last of the Lands" and is the author of "The Environmental Boomerang" and a number of other scientific publications.
- Dr D. L. Serventy, a retired CSIRO scientist from the Division of Wildlife Research, is also a member of the Board.

RIVETT LECTURE

The 1973 Rivett Lecture will be delivered by Professor Carroll Williams, Bussy Professor of Biology at Harvard University, Cambridge, USA.

The lecture which was established in memory of Sir David Rivett, a former Chairman of CSIRO, will this year be given at the University of Adelaide on 20 September. Its title will be: "All you wanted to know about insect hormones . . . but were afraid to ask".

1888 and the colony—
First ANZAAS in Sydney

"Tuesday evening saw squeezed into the Great Hall of Sydney University an almost bewildering amount of knowledge — more, in fact, than could be seen on the same night under any roof in Sydney now that Parliament is in recess . . ."

So said the Sydney Morning Herald in August 1888 in the columns devoted to the first meeting of the Australasian Association for the Advancement of Science, the forerunner of ANZAAS.

A glance back over these early files is enough to make anyone stop and think about the association with its aim of the advancement of science, while the reports of the addresses given to the 750 people present give an insight to many of the questions of the day.

It was not, for instance, for Mr S. H. Cox to be concerned then with the genesis of hydrothermal and magmatic ore deposits, a subject on this month's ANZAAS programme. Rather, he was still concerned with gold and the reckless way miners had squandered their returns, one having been so unbalanced as to have had his horse shod with

Strikes were not new even then on the industrial scene, one speaker claiming they were caused "through selfishness, ignorance and greed" which affected the whole field of colonial labour, albeit the men had a right to express their grievances.

The deep drainage system of Adelaide was the envy of colleagues in Melbourne and Sydney when an engineer on the scheme claimed Adelaide was the cleanest city in the colony and had the lowest death rate.

Mr J. J. Wild gave a learned oration on "the outline of anthropological science which," he said, "was a new discipline developed by the intense intellectual activity of the 19th century."

And Professor Black, talking about chemistry and mineralogy, had the foresight to claim that chemistry was of great importance to education and should be taught as a subject in secondary schools.

tions on meteorology, sea depths, temperatures and currents, terrestrial magnetism, natural history and geology as well as the commercial value of seals and whales.

The possibility of the discovery of minerals was not to be overlooked, but his special interest lay in the auroral activity which it was being said, might be in some way related to weather changes in Australia.

"If this be so," he said, "and the 11-year period of auroral activity can in some way be correlated with our Australian cycles of drought and abundance, the aurora in Australia will have acquired a new interest. . . .

"The exploration of these regions is a task, which, by our geographic position and wealth, is thrown on Australia as a duty which cannot be evaded if we have any adequate conception of our great position in the sou-

A family lesson in astronomy in Melbourne. This picture is reproduced from the "The Australian Sketcher", 2 February 1880. It accompanied an article on Hayley's comet in which the author seemed none too sure about the influence comets might have on the earth's surface. He noted the co-incidence, however, that such "apparitions" sometimes appeared in conjunction with a good wine harvest and was optimistic about that year's grape season.

gold. But with vision he added: "Australia is essentially a mining country . . . and it offers every inducement for the further development of its resources".

"Vaurien", a *Herald* commentator, was pleased to have an assurance from Mr R. L. J. Ellery that the recent observations of canals or channels on Mars were not the work of Martian inhabitants.

"These observations have been dilated upon by science fiction writers," said Mr Ellery, "who claim that the canals have been dug for irrigation or other great engineering purposes."

Social problems of the day revolved around a fungus mould in bread caused by contaminated baking vessels, and typhoid, the conditions of milk and infant mortality in Queensland

Scientists like Sir James Hector from across the Tasman, brought first hand accounts of the volcanic eruption at Tarawera when the famous pink and white terraces were totally destroyed and there was excitement in the zoological air over the discovery of the pineal or third eye in some lizards like New Zealand's tuatara.

But perhaps one of the most interesting pictures of the day came from Mr G. S. Griffiths who addressed the congress on Australasia's duty in Antarctica.

Claiming an expedition should be sent south, he said that it should have as its aims a "flying survey of the coastline lying within the Antarctic circle and the discovery of waterways which might lead to the South Pole." It should make observathern seas and any healthy ambition which transcends producing the best kind of wool or the finest wine or raising gold and silver.

"If ever an Australian statesman had a chance of immortalising his name it is now," said the enthusiastic Mr Griffiths. "Where is the politician with a mind sufficiently educated and with views sufficiently broad to grasp the situation and to crown his brows with immortal laurels by taking a step which would secure for this colony universal allusion and the approbation of the entire civilised world.

"If we do not move in this matter speedily, Germany will forestall us to our mortification and disgrace."

NEW CHIEF FOR ANIMAL HEALTH

Professor A. K. Lascelles (right), Professor of Dairying at the University of Sydney, has been appointed Chief of the Division of Animal Health.

Making the announcement, the Minister for Science, Mr W. L. Morrison, said the vacancy had been created through the appointment of the former Chief, Dr A. E. Pierce, to the Executive last year.

Professor Lascelles is a physiologist with experience in many related fields, including radiology, experimental surgery, experimental pathology and immunology.

He is best known scientifically for his work on the analysis of immunity to mastitis and has achieved an international reputation for his research on the transfer of immunoglobulins to milk and other body fluids.

Professor Lascelles is 42, married and has four children. He graduated B.V.Sc. (1952) and M.V.Sc. (1959) from the University of Sydney and received his Ph.D. from the Australian National University in 1963.

From 1962-63 he was senior research fellow in the Dairy Research Unit of the Department of Animal Husbandry, University of Sydney, and during the next two years was acting director of the unit.

He will take up his appointment towards the end of the year.

Professor A. K. Lascelles

Tea ladies please note: According to a report from London, scientists have come up with the perfect method of making a "cuppa". Turning their backs on everything their grandmothers taught them, the experts, who work for the British Standard Institute, have decreed it is NOT necessary to warm the teapot first.

But, they say, the milk should go in the cup first and — this is very important — the pot should stand for six minutes. No more. No less.

Bridge surgery in Darwin

A joint effort between the Division of Building Research, Highett, and the Commonwealth Department of Works has saved a footbridge in Darwin.

At the request of the Department, Mr E. N. Mattison recently spent a week in Darwin supervising repairs to one of the spans of a pedestrian overpass which crosses Bagot Road, a six-lane divided highway.

The prestressed concrete span had been severely damaged by heavy earthmoving equipment, and while basic repairs had been made by the Department of Works, it was still necessary to attend to the remaining cracks in order to protect the steel prestressing rods from corrosion, and to restore the span to its original stiffness.

The Division has had considerable experience in using epoxy resins to "heal" cracks in concrete, and during his time in Darwin Mr Mattison was able to effect repairs to the 30 feet of cracking involved. The footbridge was subsequently successfully proof-loaded.

If this combined repair operation had not been carried out, it would have been necessary to consider replacing the span, at a cost of at least $20,000.

Winners take the cash

About 360 optimistic gamblers turned up to a function at Head Office last month for the drawing of a raffle — the first prize was worth $1000 in travel tickets or $800 in cash.

Club President, Harry Kwong, explained that it had originally been the committee's intention to specify the prize would be a ticket for two to a romantic Pacific island — possibly Mururoa — but it had been decided to allow the winner(s) to "do their own thing".

He also made it quite plain that the raffle was not in aid of any charity. It was a straightout way of making money for the club's Christmas fund.

The Chairman, Dr J. R. Price, drew the lucky number which went to Martin Combe, a member of the finance section at Head Office, and his wife, Marjorie. Nineteen prizes of $10 each were also drawn.

After a weekend of careful deliberation, the Combe family settled for the cash prize but may spend part of it on a holiday.

New D.Sc.

Dr A. F. Bird of the Division of Horticultural Research, Adelaide, has been awarded a D.Sc. by the University of Edinburgh for a thesis entitled "The Root-knot Nematode". The thesis collects together almost 16 years of research findings concerned with the development, growth and morphology of the root-knot nematode and its relationship with host plants.

"Come on in—the pollution is at a tolerable level."

Editor: A person employed on a newspaper, whose business it is to separate the wheat from the chaff, and to see that the chaff is printed.

Printed by CSIRO, Melbourne

coresearch

For circulation among members of CSIRO staff

September 1973

172

Head Office announces Organization changes

A revised structure has been approved for Head Office and became operative last month.

The Secretariat now comprises five groups reporting to the Executive Officer, Dr J. A. Allen, instead of the previous three. This has involved the separation of the previous Communication Services Group and the Central Library and Information Services from the Administrative Branch.

The former Communication Services Group has been renamed the Central Communication Unit. Mr George Williams has the new title of Manager of the Unit and will be responsible for developments and their implementation in the field of public communication in those areas which are not the responsibility of Divisions and Sections, the Central Library and Editorial Section and the two Head Office Science Branches.

Another change has come in the reconstituted Central Library and Information Services.

This is now the Central Information, Library and Editorial Section. It will bring together the existing Editorial and Publications Section and the Central Library and Information Services into one group.

With the impending retirement of the Chief Librarian, Miss Betty Doubleday, the position of officer-in-charge will be advertised soon on an international basis.

Until an appointment is made, Mr L. G. Wilson will be temporarily responsible for looking after the Section, Miss Doubleday having relinquished her post to undertake special duties until her time of departure.

Mr Peter Dawe has succeeded her as Chief Librarian and Mr Clive Garrow has been appointed to the position of Manager of the Information Service. Mr B. J. Walby will continue as Editor-in-Chief of what will now be called the Editorial and Publications Service.

A new position of Senior Assistant Secretary has been added to each of the Agricultural and Biological Sciences and the Industrial and Physical Sciences Branches to relieve Messrs A. F. Gurnett-Smith and J. P. Shelton of some of their work. These positions will also be advertised soon.

It is intended that the coordinating responsibility for environmental matters at Head Office level will be vested in the Agricultural and Biological Sciences Branch.

Other changes include the provision of two new senior positions in the Administrative Branch — Senior Assistant Secretary (Administration) and Senior Assistant Secretary (Finance and Properties). Messrs J. Coombe and R. W. Viney have been appointed to these positions.

Mr G. D. McLennan has been appointed to a new position of Assistant Secretary (External Relations). The other positions of Assistant Secretary (Personnel) and Assistant Secretary (Finance and Supplies) are to be advertised within CSIRO.

New project will assist Thais with baby foods

Dr Alex Buchanan (right) who has been in charge of the New Foods Group at the Dairy Research Laboratory, Highett, has been seconded to the Department of Foreign Affairs for a two-year term to work in Thailand.

He left Australia last month for Bangkok where he will assist the Institute for Food Research and Product Development, Kasetsart University, in their project to produce low-cost, high protein weaning foods for infants.

His appointment follows a request from the Thai Government to the Government of Australia to provide a research scientist for their programme which also includes developmental work on other foods.

Dr Buchanan's work in Bangkok will be part of a Colombo Plan project and the Thais will provide an extensive amount of the back-up services. Under the Colombo Plan, the Australian Government will also provide equipment — valued at about $90,000. There will be arrangements for counterpart training of Thai graduates in Thailand and possibly also in Australia.

The main aim of the programme is the development of weaning foods which will be based as much as possible on local raw materials. They will be designed to suit the eating

Cont'd on p. 4.

"Brew-up" time on an early morning trip to study the wildlife in the Eurobodalla Shire sees Dave Shorthouse (CAE) getting some advice on how to boil the billy from team mates (from left) Egons Everson (LUR), John Morris (CAE), Peter Richardson (LUR), Henry Nix (LUR) and Mike Austin (LUR). (LUR: Land Use Research; CAE: Canberra College of Advanced Education.)

CSIRO makes land use survey on South Coast

Eurobodalla Shire on the south coast of New South Wales has been the scene of a quiet invasion over the last few months by a team of scientists from the Division of Land Use Research in Canberra.

The team, led by Dr Mike Austin, is undertaking a pilot survey of both the environmental and social resources of the shire. This is being done at the request of the NSW Department of the Environment, which believes the information which could flow from such long-term comprehensive surveys as this could provide an invaluable guide for the balanced development of its coastal regions.

The purpose of the project however, is not so much to obtain a complete picture of every facet of the Eurobodalla Shire, but rather to develop methods for gathering and analysing such information so that anyone else in Australia wanting to do a similar regional study would have available a system by which it could carry out the work in an effective manner.

From such surveys the authorities concerned can then decide what are the most suitable uses of the land resources within their areas. This also applies to the Eurobodalla Shire where it is for the authorities to decide how best to use their land — it is not for the team to make such decisions for them.

Location

The Eurobodalla Shire stretches from the fishing ports of Ulladulla in the north to Bermagui in the south and runs at times about 65 kilometres inland. It covers an area of about 6000 square kilometres (2300 square miles). The shire varies widely from the sandstone plateaus in the north, (similar to those around Sydney) to the Tuross area in the south with its trout streams, reminiscent of those in the Snowy Mountains.

The coastal areas provide further contrasts with their mangrove-fringed estuaries, farms, coastal lakes and dunes, all of which make it a popular place with families from Canberra and Wollongong.

To complement the study of the shire's physical resources, Mike and his team are hoping to learn how changing land use affects the prosperity of the people who live in the region or use it, and their environmental preferences.

The depth of the survey, however, and the time it takes to complete, is at present limited by the resources of the Division itself.

So far about a dozen people are involved to varying degrees but outside Mike, only three others have as yet been engaged on the work on a full-time basis. They are Dr Doug Cocks, Dr Bob Galloway and Mr Bob Gunn.

Appointment

This month will see an innovation for the Division with the appointment of its first human geographer. He is Dr Peter Laut, an Australian who has been working in Canada and who will also become a full-time member of the team.

"The team is also planning to work closely with CRES, the Centre for Resource and Environmental Studies of the Australian National University," Mike added. "They intend to appoint two research fellows to work on the social aspects of the study, which will complement the environmental and biological work of the Division."

Some of the staff of the Canberra College of Advanced Education have expressed interest in the project and at the beginning of last month joined Mike and the team on a wildlife survey in the area.

Surveys

A lot of the work has necessarily to be done out in the field and the Division is one that is well equipped and skilled in the art of doing surveys in rugged terrain.

Already the team has travelled hundreds of miles in four-wheeled drive vehicles over land some of which is fit only for goats to move around on. They put one vehicle over a bridge that hadn't been used for years only to find the logs were rotten and they were left miles from anywhere with a Landrover that was up to its axles in space between terra firma and a deep creek and no available help.

They have made aerial reconnaissances with assistance from the Naval Station at Nowra and have spent time camping in the bush. "And that hasn't always been like the holiday it might sound, what with cold winter rain and leeches trying to creep into our sleeping bags," Mike said. "For all that, the survey has been pretty easy in comparison with some of the ones the Division has undertaken in northern Australia."

To date more than 100 farmers have been interviewed and on only two occasions has there not been immediate and friendly co-operation and even then, a few moments of discussion with team members were all that was necessary to obtain their help.

In addition to the field work, much of the team's time is spent back in their Canberra offices where among other things, data have to be processed for information storage and retrieval which will be used along with the computerised mapping facilities being developed by the Division.

CSIRO's first rainmaker retires

Canberra has put the "closed" stamp on the file of Australia's first rainmaker, Mr Jack Cotterill, one of the legendary personalities around CSIRO.

After 35 years, Jack has retired from the Organization where he was on the headquarters clerical staff. He plans now to "get a couple more hours sleep a day, go trout fishing twice a month and help the family in their farming and garage enterprises".

Jack joined CSIR in 1938 as "mechanician", a title he held until it was changed to the less pretentious "mechanic" after the war years. About 1950 he transferred to the clerical staff and became a purchasing officer.

Talk to people round CSIRO and they'll tell you countless stories about Jack Cotterill. They'll tell you "he's a great bloke, a real genuine sort of person," and then they'll say: "Did you hear about the time he . . ." And off they go with yet another tale that makes you wonder what sort of person Jack Cotterill really is.

By the age of 20 Jack had developed an interest in flying and in 1928 learned to fly with the Royal Aero Club in New South Wales. He became the first person in the ACT to hold a pilot's licence and it wasn't long before he was instructing for the Canberra Aero Club.

He built an aeroplane known as the Flying Flea, the first to be built in Australia powered by a single cylinder engine. Later this was dismantled and an improved version constructed.

"In those days Ainslie was the edge of Canberra," Jack recalled. "There was a cow paddock we used to fly from at the edge of Ebden Street, but I admit there were times when we took off from the street instead and then flew out over the paddock."

On one occasion Jack witnessed his partner, Arthur Powell, crash into a field. He was trailing behind in his car and reached the aircraft just before it burst into flames.

"I knew I had to get him out but he was unconscious," Jack said. "Then the plane went on fire and I had to work quickly. I put my weight behind him and pulled and broke both his legs in the process. We weren't supposed to be flying because the plane wasn't registered so I pitched the doctor a tale that Arthur, who was a builder, had fallen from the scaffolding.

"When Arthur regained consciousness, he didn't remember the accident and the doctors told him he had had this fall. For a long time he believed that that was what had happened."

Of course, in telling the story, Jack makes no mention of the risk he took in rescuing someone from a burning aircraft. But then, you wouldn't expect him to say anything about that.

RAAF service

When war broke out Jack volunteered for service with the RAAF and became an instructor. He spent some time in Papua New Guinea and then became Commanding Officer of the RAAF Station at Mascot. Some of his duties, as one might well expect, were scarcely orthodox.

CSIR had been asked to experiment with rainmaking procedures to help relieve drought conditions which were being experienced. Someone was needed to fly the aircraft to drop the material on to the clouds, and Jack agreed to do the job.

"But in those days people didn't appreciate what scientists were trying to do and there'd have been all hell to pay if we'd caused a flood and ruined the crops. Or if a flood occurred naturally and the farmers knew about our experiments, we'd have got the blame. So I just used to write those trips down to 'test flights'," he said.

There was also the time when some people believed radar was an infallible way of detecting the arrival of enemy aircraft. Tests in Europe had shown that radar facilities could be put out of action by dropping showers of tinfoil, a process known as "window dropping".

"Some of this stuff was brought into Australia secretly and I flew on the sortie when we dropped it," Jack said. "Our radar blokes at the coastal stations hadn't been told about it and there were screams from them up and down the coast when the screens were put out of action. But we proved the point about its effectiveness."

Instructor

Back in his home Territory after the war Jack continued flying and was chief instructor for the Canberra Aero Club. The patron was then Mr Casey, later to become Australia's Governor-General, and one of Jack's pupils was Lady Casey.

Jack combined his flying interests with his mechanical ones and became pit manager and mechanic for the champion Australian racing driver, Alex Mildren.

Over the years he had built up a wide circle of friends and colleagues who ranged from service personnel to sporting personalities, from politicians to those who lived in Vice Regal circles. And it was because he was so highly respected by all those who were associated with him that he was able to open so many doors when as purchasing officer he wanted things done for CSIRO.

"That's where I got so much satisfaction in my work," he said. "I prided myself I could get anything anyone wanted or find the bits to make it."

New flag

Around Canberra they tell the story about Jack and the flag of an embassy which shall remain nameless.

Some years ago there was an international scientific meeting being held in Canberra and each country represented was to have its flag flown. But there was one country for which no flag was available. The embassy concerned had one it flew over its offices, but naturally they were reluctant to part with it. Eventually, however, they were prevailed upon to do so on the condition that it was returned immediately afterwards.

"Well, you might have known it! The only flag to be damaged when we took them down was that one," Jack recounted. "It was beyond repair. I was asked what I could do about it. I had a friend in Sydney who made flags but he went up in the air at the suggestion he make one for this particular country since he was not licensed to do so.

"It took a little friendly persuasion and few reminders of old flying days together but eventually it was agreed that the flag would be made. It was rushed to Canberra overnight, not without a few incidents, but we had it ready to return to the embassy the next morning. It was duly flown from their buildings for some time to come after that. If they recognised the change, no one ever reported it to us."

Jack's flying ability has often come in handy. On one occasion he was seconded to fly the mail from Albury to Canberra when there was no service from Melbourne beyond that town.

Another time he flew a plane for Dr Max Day when he was doing myxamatosis experiments. His chief worry then was to get the aircraft down without entangling the controls in the nets he was trailing to catch insects.

He also flew for Dr F. Ratcliffe when he was carrying out rabbit population research. "There were compensations for the low-flying I had to do . . . we worked in some of the back country and I was able to mark down some good trout streams where no one else was likely to go," Jack added. "I've got some of them earmarked for my retirement."

Jack Cotterill, one of Australia's pioneer flyers and one of CSIRO's best-known personalities, has retired. From now on he plans to catch trout and get in two more hours sleep a day.

Honour for Chief

Dr P. J. Claringbold, Acting Chief of the Division of Computing Research, has been elected an Ordinary Member of the International Statistical Institute. Although Dr Claringbold's original training was in veterinary science, in more recent years he developed a comprehensive interest in the application of statistics to biological research.

With the advent of computers, he evolved methods for collection and analysis of biological data which make use of the automation computer techniques offered.

Dr Claringbold has been Acting Chief of the Division during the absence in London of Dr G. N. Lance, who has been the Chief Scientific Liaison Officer in the United Kingdom.

Prawn boats help in northern survey

The crews of more than 300 prawn boats have been helping CSIRO with its Northern Prawn Survey, a major research programme which is being carried out by the Division of Fisheries and Oceanography, Cronulla.

Started in 1969, the project has aimed at establishing the various types of prawns available in commercial quantities and where and when the prawns are located.

It also seeks to ascertain the size and rate of development of the prawns, to determine the type of water and its nutrient content in which the prawns are likely to be found, and to study their spawning and migratory habits.

The survey has also involved a study of the tides and currents of the area which stretches from the waters of southern Queensland right round the north of Australia to Nickol Bay in Western Australia and up into the Gulf of Papua.

Early in 1970 it was decided that the prawn fishermen who were involved in the industry that has since become a multi-million dollar business for Australia, could help the survey substantially if they were to keep logs which would contain information useful to both the Division and themselves.

The liaison officer appointed to work with them was Clarrie Brown and, along with another Cronulla colleague, Len Brown, he has since established a good working relationship with the fishermen throughout the region.

There's not many of them now that Clarrie wouldn't know. To reach the men he has used whatever means of travel were necessary or available. This has included boats, four-wheel drive vehicles and sea planes.

"You'll sit up there at Weipa sometimes, maybe for three weeks, waiting for the fleet to come in," Clarrie said, "only to find they've gone to Karumba. Sometimes it's all straight forward, but you've got to go where the men are if you want their help."

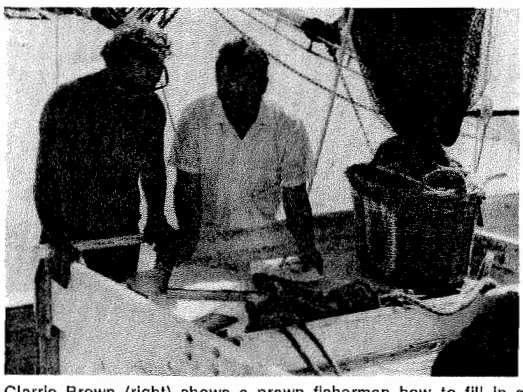
The log books are supplied to the fishermen by the Division. The men fill in the data about their catch — the dates, its size, location and the types of prawns found. These may range from blueleg, king and banana to endeavour and tiger or a general assortment.

The men fill in three copies of the log pages, one of which they keep for their own records and the other two are sent back to the Division.

"If they refer to their records over the years they'll see a pattern emerging which may be pretty useful to them," Clarrie said.

"We've also offered to give them a monthly summary of their activities which saves them doing their own calculations. This tells them the number of hours they've been at sea, the days on which they fished and the size and type of their catch. This is also useful for them when it comes round to income tax time."

At Cronulla the data is computer processed to form another link in the survey, a continuing affair which involves about 17 officers of the Division.



Clarrie Brown (right) shows a prawn fisherman how to fill in a log book.

Solar Energy

Mr Roger Morse, Chief of the Division of Mechanical Engineering at Highett and a former past-president of the International Solar Energy Society, has been re-elected as one of the 25 members of the Society's Board of Directors. Mr Frank Hogg of the Division has been reappointed its secretary-treasurer.

Two other Australians were also elected to the Board at its recent international meeting in Paris. They are Mr J. G. Baker, a Sydney businessman, and Dr N. R. Sheridan of the University of Queensland. The Society has its headquarters in Melbourne.

Solar heaters

The National Capital Development Commission is studying the possibility of installing solar hot water systems in Government houses in Canberra. These are already standard equipment in new Government houses built in the Northern Territory and are installed in Commonwealth houses in Papua New Guinea. A major consideration will be the economics of the operation since the heaters in Canberra would almost certainly need electrical boosters.

Gondwana scientists meet

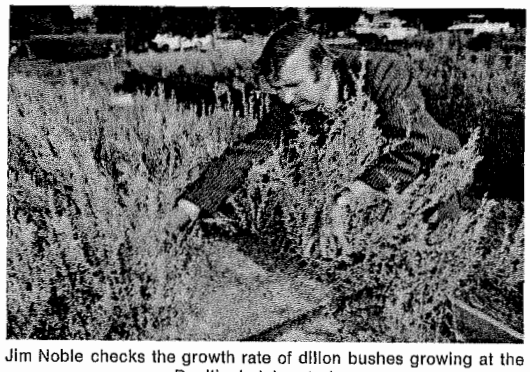
Three members of the staff of the Division of Mineralogy, Sydney, were among the 200 scientists who visited Canberra last month for the Third International Gondwana Symposium.

They were Dr M. Shiboaka, Ms Michelle Smythe and Mr A. J. R. Bennett, who along with a university collaborator, Mr R. A. Britten, presented a paper in the section on the environment and origin of Gondwana coal.

The wide range of topics under discussion gave some idea of the complex issues which are being raised by scientists on Gondwana. Apart from the coal section they included:

- Palaeogeography, including palaeoclimate and palaeomagnetism.
- Gondwana flora.
- Age and stratigraphical relations of glacial deposits.
- Advances in stratigraphy and palaeontology.
- Tectonics, igneous activity, geochronology, structural geology and the continental margins.

Following the conference, field trips were arranged which allowed the participants to make a study of Australian Gondwana glacial deposits in South Australia, Victoria and Tasmania. In Western Australia the Perth and Carnarvon Basins were visited and in Eastern Australia the scientists studied the Sydney Basin, including the Hunter Valley region.



Jim Noble checks the growth rate of dillon bushes growing at the Deniliquin laboratories.

Evidence of 'super-continent' mounting

For many people, the Gondwanaland story is still a piece of science fiction, but throughout the world the existence of the former super-continent comprising at least Australia, Africa, Malagasy, South America, India and Antarctica has become widely accepted.

Although the idea of drifting continents had been advanced earlier, it was not until the end of the 19th century that geologists seriously suggested the existence of a large ancestral continent in the southern hemisphere in the geologic past.

It is on record, however, that in 1858 a group of scientists announced that the shape of the coasts of South America and Africa suggested that at one time they might have been joined together as one country.

In 1937 the celebrated South African geologist, Alexander du Toit, published a book in which he set forth geological evidence concerning the theory of the break-up of the super-continent and its subsequent continental drift.

In 1947 an amateur geologist visited the Department of Earth Sciences at the Washington University and tried with great persistence — and frustration — to present what he claimed was "concrete evidence" of the existence of Gondwanaland. He received no sympathy and his ideas were dismissed.

By 1966, the same department, along with scientists and geologists all round the world, were attempting to unravel the mysteries surrounding the accepted existence of the continent. Many still feel the key to much of the story lies in Antarctica.

The International Geophysical Year (IGY) in 1957 marked the beginning of a new era of exploration in Antarctica and since then scientists, particularly those interested in geology and palaeontology (the study of fossils), have come up with some significant discoveries relating to Gondwanaland.

Discoveries

In 1967-68 Dr Peter Barrett, a New Zealander working with the Ohio University (USA) team, came across a fragment of a fossilised jaw of a *labyrinthodont*. An amphibian, this animal was a representative of a group which inhabited the earth during the late Palaeozoic and Triassic times, about 200 million years ago.

Where one such fragment had been found, chances were there would be more. Since then, the university's Institute of Polar Studies in co-operation with the US National Science Foundation, and the Victoria University (NZ) have mounted a number of expeditions to the Transantarctic Mountains where numerous fossil finds have provided further evidence that at one time animals did indeed inhabit the Antarctic continent. Moreover, they were animals whose fossilised remains have been found in the other countries believed to have been part of Gondwana system.

One of the remarkable discoveries was a portion of a skull of *Lystrosaurus* which was subsequently identified as being "essentially identical" to the *Lystrosaurus murrayi* found in similar Triassic sediments of South Africa.

Lystrosaurus was about the size of a dog with a heavy body, short limbs, broad feet and a beaked skull. Scientists already knew of its distribution through South Africa, the Indian Peninsula and in China, but now Antarctica could be added to the list.

Lystrosaurus was described as a denizen of the land. Although it may have been equatic to the extent of living around rivers and lakes, there was no evidence to suggest it was capable of crossing ocean barriers.

Flora research

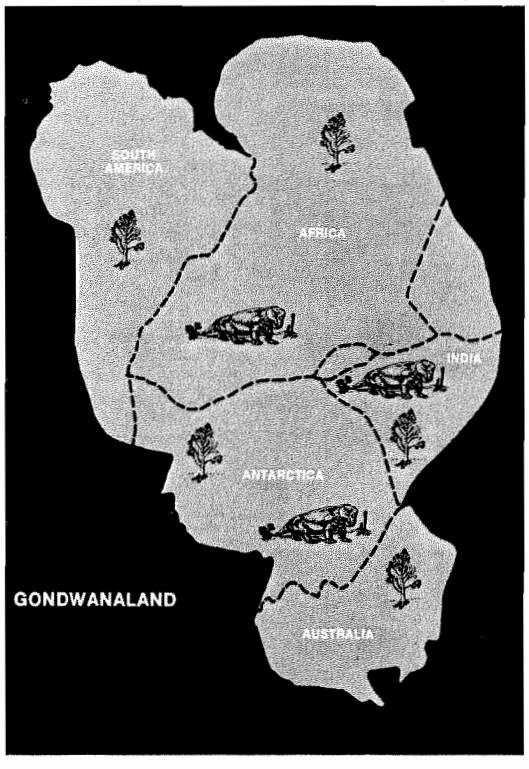
The distribution patterns of certain flora, like the fauna discoveries, have also been cited as proof of the Gondwana theory and a CSIRO scientist who is investigating this aspect is Jim Noble of the Division of Land Use Research laboratories at Deniliquin.

For three or four years Jim has been making a study of the dillon bush (*Nitraria*) which is a species that occurs over a wide area of arid and semi-arid country in southern Australia. The plant may have an important role in the areas where it grows for it is believed that it is an "indicator" species, which will assist with the management systems used to assess range conditions and trends — when land is being overgrazed this is often the time the dillon bush best flourishes.

"Australia is the only country in the southern hemisphere where the dillon bush grows but it is found in North Africa, the Middle East, parts of Europe and in Asia," Jim said.

"Russian botanists who have studied the bush in relation to the Gondwana system believe that it originated during the Cretaceous period (70 and 135 million years ago) on the western rim of what they call the 'Gondwana fragments'."

While Jim's major interest in the bush is its place in the rangelands flora, he is also investigating its relation to the northern hemisphere species and its role in the Gondwana theory which may add further weight to the now widespread belief that Australia was in some way linked to the super-continent.



Deciding how the countries believed to have been part of Gondwanaland were related to each other is like playing with a jigsaw puzzle. This sketch (courtesy Dr Edwin H. Colbert, New York) shows one way of reconstructing it, but other scientists have shown the juxtapositions of the various countries in several different ways.

Doctorate for Chief

The Chief of the Division of Fisheries and Oceanography, Dr K. Radway Allen (right) has been awarded a Doctorate of Science from Cambridge University. Dr Allen was able to receive his degree from a Convocation of the Senate of the University during his recent visit to England where he was attending the International Whaling Commission.

The degree was awarded in recognition of his published papers, about 80 all told, over three main areas: trout streams and trout population ecology; theoretical population dynamics; and the analysis and assessment of whale stocks.

At the meeting of the Whaling Commission, Dr Allen was one of Australia's two scientific advisers, the other being Mr John Bannister of the Western Australia Museum, while the Australian Commissioner was Mr Arthur Bollen of the Fisheries Division of the Department of Primary Industry, Canberra.

While he was away, Dr Allen also attended an international meeting of a small working group of seven scientists which has been set up by FAO to make a study of marine mammals.

Campaign for fruit fly to be considered

When the Commonwealth and States Entomology Committee meets in Lae in Papua New Guinea next month it will have on its agenda the question of an eradication campaign to get rid of the Queensland fruit fly from Australia.

The Standing Committee on Agriculture has asked the CSEC to look into the feasibility of such a campaign and suggestions for this have been prepared by Dr Alan Bateman of the Division of Entomology's Fruit Fly Unit which works out of the Department of Zoology at the University of Sydney.

A campaign to get rid of the insect in Australia has been considered for some time but the major problem has been the vast areas involved, the cost of covering them, and the development of suitable techniques, especially those in rain forest regions.

But Australia is not the only country concerned with such eradication projects. In recent years the Queensland fruit fly has greatly increased its range of distribution by spreading to certain islands of the south Pacific.

In 1970 it was found in New Caledonia and the Society Islands, including Tahiti, and in 1971 it appeared on Easter Island some 2500 miles further east and on the threshold of the South American continent. This development was viewed with grave concern by the Chilean Government because it posed a very serious threat to their mainland fruit industry.

Assistance

The Chileans immediately asked for the help of Australia and last year Dr Bateman made three trips to the island. He provided the authorities there with a blueprint for its eradication and assisted them in the field programme.

Two methods of suppression were used against the fly population, each using a different specific chemical attractant mixed with the insecticide Malathion, but applied in different ways. Each method used alone might have been adequate but previous research in Australia had shown that simultaneous application of the two considerably enhanced the chances of success.

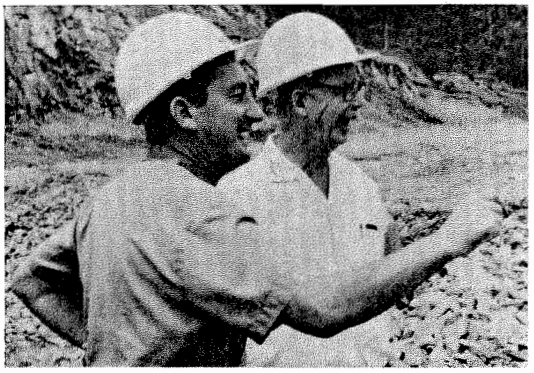
The treatments were started in July, and within a month the detectable population had collapsed to zero. No live specimens have been found in the island since then, despite an exhaustive search in November.

At the end of the project a comprehensive network of detection traps for the five major fruit fly pests now occurring elsewhere in the Pacific region was set up as an "early warning" system. This should minimise risks of the island becoming reinfested and acting as a staging camp for species noxious to Australia and elsewhere.

Request

Dr Bateman has now been asked by the French Polynesian authorities to prepare a similar blueprint for the eradication of the fly in their area and this has been done. If finance is available, the French hope to begin their operations this month and Dr Bateman may go to Tahiti to supervise the work.

In the meantime, he has been in Switzerland attending a conference of the International Biological Programme where he was leader of a fruit fly working group.



Mr R. C. Fisher, Assistant Pit Superintendent at the copper mine site at Panguna, on Bougainville, in Papua New Guinea, shows Mr Chris Christian (right) where some of the development is taking place. (Picture: Courtesy CRA.)

'Chris' Christian in new role

At the end of last year, Mr C. S. (Chris) Christian retired from the Organization after being a member of the Executive for 13 years and being with the "firm" since 1933.

That should have been enough service to have earned him the right to take a long holiday, but that is not the nature of Chris Christian.

Instead, early this year he joined Conzinc Riotinto of Australia as a part-time consultant and has already visited a number of operations including Bougainville Copper at Panguna on the island of Bougainville in Papua New Guinea, Hammersley Iron, Sulphide Corporation, Heron's Creek Timber Mills and some coal interests.

Mr Christian is serving the CRA Group through its General Mining Division which has the responsibility of co-ordinating environmental efforts for the Group. He is working in an advisory capacity, the responsibility for environmental practices remaining with the operations themselves.

According to Mr Don Fairweather, General Manager of the Division, the Group is fortunate to have available to it Mr Christian's wide knowledge and experience and he has already made a number of positive suggestions towards improvement of the environment at the operations he has visited.

"He will be able to spot problems and anticipate new ones for us," Mr Fairweather said. "Not only will his own valuable services be directly available to us, but he will be able to direct the Group to specialists dealing with specific problems."

Mr Christian himself says he's finding the work interesting and is pleased at the receptive attitude of the company personnel. "With their co-operation," he said, "I'm looking forward to making a positive contribution on environmental issues in the industry."

"Sir . . . we've managed to recycle Professor Henley."
(Courtesy "Punch")

SAFETY NOTES

Really Hot

An electrical short circuit recently occurred in an oil-filled radiator. These units are popular in many laboratories as they have no exposed hot elements. In the case above, oil had leaked into the box containing the thermostat and terminal block, destroying the insulation and a slight movement of the unit caused the short circuit. If you have one of these radiators, check it for oil leaks.

Another warning — these radiators are *not* safe for use in a flammable atmosphere. The thermostat is not in a vapour-proof box, and could spark off an explosion.

Don't be Needled

Many of our autoanalyser samplers have sampling needles which are forcibly driven up and down, and can be a hazard to unwary operators as the needle could easily penetrate the wrist or palm. Tests on one unit showed the needle would easily penetrate a 25 mm thick block of hard paraffin.

Skating Rinks

Every laboratory seems to have one — a section of floor, ramp or stair which is dangerously slippery. The hazard can be significantly reduced by the application of a non-skid paint, or strips of contact adhesive anti-skid tape. Regarding the latter, ask us for a free sample.

— J. Hallam, Safety Officer.

Letters to the Editor

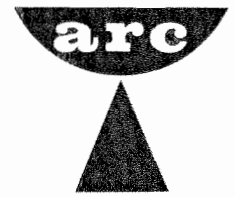
New title

Sir—

Now that the tide of "Commonwealth" is receding before the wave of "Australian" it may be time to consider a new name for the Organization. This is particularly so as the social sciences begin to intrude on the agricultural, industrial, etc.

May I suggest a name with a less specialised connotation and allowing the addition of even more varied activities. We could become the Australian Research Commission or ARC, with our symbol or motif those initials within a portion of a circle, so

The style of print could be left to the graphic artists, but suggestions of a lightning flash through the letters may please the electronics and engineering groups. On the other hand, to satisfy biological mr. and ms., Noah's vessel depicted balancing delicately but high and dry on a mountain peak may be more acceptable.



The Terms and Conditions of Employment could be called the Covenant, but I find it more difficult to suggest an appropriate name for your newspaper; perhaps "Archives" . . . or would that be where the workers are?

T. G. Brock,
RAO, Sydney.

They had a ball!

The Townsville Laboratory recently held its eighth annual ball at the Townsville Golf Club. The theme of the evening was "Disguise" and prizes were awarded for the best masks. Because of the effectiveness of their masks, the winners should remain nameless. Nevertheless, Coresearch discovered they were:

Most sylish lady — Ms Cecily Edye.
Best couple — Mr and Ms Ian Crutchley.
Runners-up (best couple) — Dr and Ms Peter Gillard.
Most humorous — Mr Richard Hollroyd.
Runner-up (most humorous) — Mr Bob Reid.
Most grotesque — Mr and Ms Barry Balgue.
Most imaginative — Mr Stephen Bailey.

Appointment

Mr Mike Jones of Mineral Chemistry, Port Melbourne, is in Indonesia on secondment for a short term to the Department of Foreign Affairs. Mike is working in Bandung at the Mining and Metallurgical Research Centre, where he is training a small group of analysts in the techniques of using the AA5-R spectrometer, presented to President Suharto by the Australian Government last year.

Work force

There is a division of labour even in vice; some people addict themselves to the speculation only, others to the practice.—William Hazlitt, English critic, essayist and lecturer, 1778-1830.

The letter below was received by the Western Australian Laboratories at Floreat Park. The young enthusiast was referred to the Western Australian Museum for whom it is hoped he is now happily "deteckting" coins.—Ed.

Dear Sir,

My name is James ——. I am In Grade V. I am 10½ years old. I like old coins and relics. If you give me a metal detecktor I will go on beaches where nobody is And deteckt coins. You will get ⅔ of what I find and I will keep the rest. Nobody will know about it if I find some. When you Pick your ⅔ of my coins you get to pick of what you want. This will happen every Sunday. I am a very hard worker and won't give up. So, in other words, I would like to become a part time member of your council.

Your sicerely
James ——.

More Indians

Sir—

I would like to dispute Ms Sonia Castro's comments in "Coresearch 170". She states: "Many Australians seem to think that South America is full of Indians and revolutions as well. Chile has European background, but its culture and language are Spanish. As for the Indians . . . they are in about the same numbers as your Aborigines."

Having travelled through South America recently and taken interest in its peoples, especially Indians, I would like to quote some relevant figures I was given. In Chile alone, where Ms Sonia Castra seems to have spent many years, there are 150,000 full-blooded Indians, almost twice the number of Aboriginals in Australia. In Bolivia with its population of 4.5 million, there is a 70 per cent Indian content. In Equador 39 per cent of the population of 6 million is of pure Indian blood. Columbia boasts of 398 Indian tribes, Peru's mining industry alone employs 80,000 Indian miners, and there are 5000 Indian settlements, mostly in high regions, where one finds it difficult to find anyone who speaks Spanish.

Erik Holm,
Division of Entomology,
Floreat Park, W.A.

Honours list

Mr L. E. Oates of the Division of Textile Physics, Wool Research Laboratories, Sydney, has been awarded the Degree of Master of Engineering Science from the University of New South Wales. His thesis was entitled: "Static stability of a plenum chamber air cushion vehicle in inclined positions."

Desert song

Sir—

I noticed a remarkable portrait of a man in the desert in the July issue. May I be permitted to point out two matters. The worker is not from the Division of Land Use Research, but the Division of Wildlife Research which maintains a group at Alice Springs studying dingoes. Secondly the worker has retained the use of his "underdaks", a remarkable phenomenon. But, the point is this: if Coresearch is as accurate as your description of that man, we are all sadly misled.

A. E. Newsome,
Division of Wildlife Research,
Canberra.

Sorry, the item came from an officer in Land Use Research and my field-bog correspondent did not think to fully establish the identity of the conscientious note-taker. Secondly, being a shy, retiring and modest lass and being unfamiliar with such pieces of desert equipment, I did not think it right that I should make a close scrutiny to see whether or not the gentleman concerned had retained his "under-daks". Besides, it's a relatively free country so why should I question such an idiosyncrasy?—Ed.

Editor's note: Madam I. L'Ayfor-Paye: All letters to the editor have to be personally signed before they can be published, though names need not be used for publication.

Agreed

Sir—

Right on, T. B. Paltridge! (Coresearch No. 170.)

Jan Peverill,
Ex-Rangelands Research Unit, Alice Springs.

Baby foods

Cont'd from p. 1.

habits of Thai children and the ability of their parents to pay for them.

Recent disclosures of a high lactose intolerance among Asians are not likely to be a problem, said Dr Buchanan. This belief was confirmed in an official statement from a UN Protein Advisory Group which set up a committee to study and report on the matter.

Another interesting aspect of the programme will be the investigation into the packaging of the products.

"You have to take into account many aspects, even the colour," Dr Buchanan said. "The wrong one may upset local beliefs in some areas. We will be looking into village conditions to see what storage facilities are like. Packages may have to be such that they could be opened and then be sealed in some way to prevent ants and other insects getting in.

"And then there's the cost factor. The large economy size may be fine for people in Australia, but where you are dealing with people who exist on a day-to-day basis for money, some packages may have to be small enough for them to buy just enough to last for a day or two."

Dr Buchanan said attention also had to be given to the type of preparations made available to the people. "There was one example of a product being sold to them which required the material to be mixed with boiled water. The village mothers soon found it could be mixed with cold water. The water they used was dirty and the children developed diarrhoea, so the mothers blamed the product and stopped using it.

"We will have to investigate educational programmes in which we will try to teach mothers to prepare the food correctly."

The Institute is fortunate in that it has ready access to a group who could be used for nutritional trials and from whom they could learn the eating habits of the Thai people.

Printed by CSIRO, Melbourne

coresearch 173

Produced by the Central Communication Unit for circulation among members of CSIRO staff

October 1973

CSIRO to set up laboratory in Indonesia

A major agricultural research project which will draw on the scientific resources of CSIRO is to be established in Indonesia. The programme, which is expected to cost about $9 million over the next 10 years, will be part of Australia's foreign aid contribution to that country.

This will be the first time that CSIRO has set up and operated a laboratory outside Australia, although in the past it has made its staff available to give technical assistance to overseas countries when requests have been received.

The new project will have its headquarters at Bogor in West Java and will initiate research into genetics, nutrition and animal husbandry as a means of increasing production from poultry, sheep, goats, cattle and buffalo.

By selection within local strains of livestock, the introduction of strains new to the region, cross-breeding and the adaptation of modern feeding techniques, it is hoped to increase the animal protein content of the food Indonesians eat.

The Indonesian Government has provided a block of land of about 30 ha near Bogor, but it will be the responsibility of Australia to design, supervise the construction of and equip the laboratory initially. It is anticipated that the design and construction will take at least two and a half years from the time Indonesia and Australia exchange letters of understanding which will give the official green light to the project.

The laboratory has tentatively been called BARI — the Bogor Animal Research Institute—and is expected to involve about 25 CSIRO scientists and support staff. The Executive is advertising for an Officer-in-Charge and a senior administrator. Both people will be located initially in Australia but will be required to make visits to Indonesia from time to time. As the other positions become needed, they too will be advertised.

The project envisages that BARI will be staffed initially by an Officer-in-Charge (CSIRO); a research leader (CSIRO); a scientific liaison officer (Indonesian); about seven research scientists (Ph.D. level) supported by about six graduate experimental officers and three technical assistants (all CSIRO); about six Indonesian scientists who will work initially at the experimental officer level after post-graduate training in Australia; and about three Indonesian technical assistants.

The Administrative staff will be led by a laboratory secretary (CSIRO) supported by a property officer (CSIRO), both with Indonesian counterparts in training; a librarian, office and workshop staff (Indonesian where suitable staff can be found, alternatively CSIRO staff with Indonesians in training); and Indonesian field and service staff (gardeners, animal attendants, field workers, drivers).

In addition, a senior member of the Indonesian Department of Agriculture will be appointed to lead a group of scientific liaison officers who will be responsible for extension activities associated with the laboratory.

CSIRO will provide the Officer-in-Charge for the first seven years after which the position will be reviewed. The Indonesian research staff will be appointed by the Indonesian Directorate of Animal Husbandry.

Objectives

The project has two associated objectives. One of these is the training, both in Australia and at the laboratory, of Indonesian scientists who could progressively replace Australian personnel, and in the other, the Indonesian Government will be helped to develop the nearby Animal Husbandry Research Institute to work on shorter-term problems in conjunction with provincial research and extension services.

The idea of the project dates back to February 1970 when the then-Minister for Foreign Affairs, Mr McMahon, proposed that CSIRO should become 'involved as an entity' in Australia's overseas aid programme. This was to be on the basis of CSIRO managing an aid project funded by his Department.

The Executive agreed in principle to accept such a responsibility, the scientific nature and size of which would depend on a thorough investigation of all the aspects involved.

This early investigation was carried out by Mr A. F. Gurnett-Smith, Secretary of the Agricultural and Biological Sciences Branch, and Mr T. Goggin of Foreign Affairs' Foreign Aid Section.

Mr A. P. Siregar, Department of Poultry Husbandry, Animal Husbandry Research Institute, Mr Alan Charles and Mr Ray McVilly, CSIRO, Professor D. Robinson, Professor of Animal Sciences, University of California; Dr M. Pandjaitin, Director, Animal Husbandry Research Institute, at the site chosen for the laboratory at Clawi, Bogor.

Priority

After an extensive visit to South-east Asia, these men recommended that Indonesia should have priority for such a programme and that the field of animal husbandry was one where Indonesia needed and would welcome assistance. It was also an area where CSIRO had staff who could materially contribute to the programme.

The recommendations received the general approval of both CSIRO and Foreign Affairs and in June last year a further team was sent to Indonesia to investigate the best ways to implement the proposed programme.

This was led by Mr Alan Charles of the Agricultural and Biological Sciences Branch, and comprised Professor David Robinson of the University of California, Davis, a former member of the staff of the Division of Land Use Research, Mr Ray McVilly, Deputy Finance Manager, CSIRO, and Mr A. Blackburn, Foreign Affairs' Foreign Aid Section.

The team spent seven or eight weeks in Indonesia during which time it came to the conclusion that the laboratory complex should be sited near the Javanese city of Bogor.

During the course of their investigations the two teams made a survey of the needs of the Indonesian people and the decision to concentrate efforts in the field of genetics, nutrition

Cont'd on page 3

Space suits saves Skylab mission

A pair of space age 'long johns' invented by Des Burton of the Division of Mechanical Engineering, Highett, helped to save the American Skylab mission from disaster.

When the three astronauts, Captain Charles Conrad, Dr Joseph Kerwin and Commander Paul Weitz, arrived on board Skylab they discovered the water cooling system was much too cold.

There was not enough electricity being made to allow them to carry out their experiments.

But the men had with them water cooled suits, based on an invention of the Royal Aircraft Establishment, Farnborough.

The suits, worn under astronauts' space suits for space and moon walks, have tubes containing water running through them.

One of the suits was wrapped round the circulation point in the system and warmed it up. The remedy worked and the system returned to normal.

In an interview, Mr Robert Thorn, head of the human engineering department at the RAE, told the British press how the suit had been invented in the physics engineering department by Des in 1964.

Des Burton

It was Des' first major job, he said, and was originally designed to make pilots more comfortable when sitting in aircraft cockpits in the tropics carrying out ground checks.

The suit was later adapted for pilots flying at high altitude.

In Melbourne, Des confirmed the story saying that the Americans working on the space missions had heard about his work and in 1965 invited him to visit their country and explain its workings.

'NASA officials saw its possibilities and developed it from there so that it was used on the first Apollo Mission to the Moon. In fact, I understand it's been used on all the Apollo missions,' Des said.

'The suit comprises a combination "long johns" and vest and keeps the body at the right temperature.'

In 1967 Des decided on a change of scenery and came to Australia where he took up a contract with the Division of Mechanical Engineering. At the end of his three years he headed back to England. He then decided Australia was really his first love after all, so he turned round and came back in 1971. The Division had the welcome mat out for him on his return.

Since being back at his old desk, Des has been working on thermal comfort projects, the results of which are expected to be announced soon.

Portrait to be painted

A leading Sydney portrait painter, Mr Graeme Inson, has been commissioned by CSIRO to paint a portrait of the former Chairman, Sir Frederick White.

Sir Frederick, who retired from the Organization in 1970, has been reluctant to have his portrait hung in the 'gallery' of former chairmen and executive officers, but he has now agreed that this could be done.

A committee comprising Dr Max Day, Mr M. V. Tracey, Dr F. G. Lennox and Mr A. F. Gurnett-Smith has been set up to make the arrangements.

The staff and other friends and former colleagues of Sir Frederick are being invited to contribute to the CSIRO portrait fund and donations may be sent to it at Head Office, P.O. Box 225, Dickson, ACT 2602.

For Oxford

Dr John Bassett (above) has ended a 12-year association with the Ian Clunies Ross Animal Research Laboratory at Prospect. He has accepted an appointment at the Nuffield Institute for Medical Research at Oxford where he will continue his work on aspects of foetal endocrinology. At Rosslab John pioneered the development of several sensitive radiostereoassay methods for measurement of steroid hormone levels in peripheral blood which have been adopted widely in Australia and overseas by workers in endocrinology.

The Foundation Chief of the CSIR Division of Industrial Chemistry and former Chairman of the CSIRO Chemical Research Laboratories, Sir Ian Wark (above), has been presented with the ANZAAS Medal. The medal, which has so far been awarded on eight occasions, is given in recognition of services in the advancement of science in Australia and New Zealand. Sir Ian was a member of the Executive from 1960 to 1965. He is an honorary consultant to the Minerals Research Laboratories and has an office in the Division of Mineral Chemistry, Melbourne. Sir Ian is also a Governor of the Ian Potter Foundation and a member of the South Australian Board of Advanced Education.

Star watchers praise CSIRO staff efforts

The staffs of the Division of Radiophysics and the National Standards Laboratory have slowly been coming down to earth again after spending many weeks working with 800 star watchers.

The astronomers were attending the fifteenth General Assembly of the International Astronomical Union and came from all over the world. Apart from the assembly itself however, there were a number of associated symposia in different parts of the country.

When it was announced that the assembly would be meeting for the first time in the southern hemisphere this year and that the venue was to be Sydney, few people realised just how much work would go into it. Now that it is over, no one has been left in any doubt about the amount of time it consumed.

For about two years in fact, the organisation of the assembly went on quietly in the background and while the Academy of Science, different universities, observatories and other institutions were involved, a great deal of the work was carried out by CSIRO.

Scientists from the Divisions of Physics and Radiophysics were involved at the professional level and read papers and chaired meetings of the 40 Commissions which make up the assembly as well as making contributions in other ways. There was still plenty of work that was less glamorous perhaps, but equally necessary to be carried out by other members of the staff, however.

Phil Kelly from Radiophysics had a bevy of girls assigned to dozens of tasks around Carslaw Building where the assembly was staged, and others back at the Epping offices were also involved. Even the former Assistant to the Radiophysics Chief, Arthur Higgs, was encouraged to come out of retirement to help the local organising committee.

Staff members assisted with the registration of participants, met them at airports and bus stations. They arranged accommodation, packed kit sets, answered a thousand queries . . . in fact, you name it, they did it!

Harry Gillett from Physics and John Masterston from Radiophysics coped with the press photography and other film requirements and the Central Communication Unit from Head Office provided the IAU with the services of two of their staff, Jack Sandry and Dorothy Braxton, to produce a daily newspaper, handle press inquiries and liaise with the media. For the production of 'Astronomy 73' they were aided and abetted by Dick McGee from Radiophysics.

Even wives of staff were involved. They formed a women's committee to look after the wives of participants who were not taking part in the proceedings and put in many hours of hard work over a period of two years to make sure that everything ran smoothly. They were also responsible for the displays of Australian wildflowers that delighted the overseas visitors.

Compliments for the successful organisation were given by many of the participants, not the least of which came from the international secretary, Professor C. de Jager.

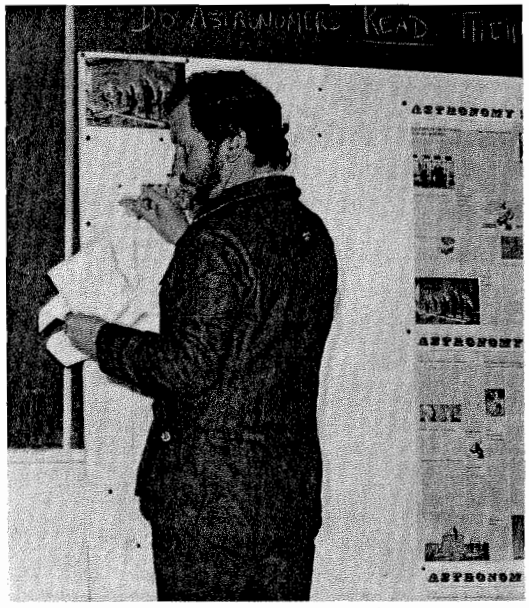
Australia, he said, had won the right to hold the conference because it was in the big league of astronomy. Its scientists set a very high standard of research and were noted for the strength of their instrumentation.

'There is no second-class level of work done in this country,' he said.

And in thanking the backroom people, he said the astronomers may not have seen much of the southern sky through the haze of Sydney but they had certainly 'sampled the generous hospitality which was everywhere evident in the perfect organisation of the Assembly'.

Laugh machine

Anyone with a good yarn to tell and who wants to test its laugh-raising qualities should get in touch with Neville Michie of the Division of Textile Physics, Sydney. Neville recently invented the machine to judge the tallest tales told at a yarn-spinning contest organised by the Division for its Community Aid Abroad activities. The pointer of the machine is operated by a servo-motor actuated from an amplified microphone in the deckle-edged acoustic horn. The contest winner was B. J. Rigby.



The last major assignment for Jack Sandry of the Central Communication Unit in Canberra before he left CSIRO to join the Department of Health was to write and produce a newspaper for the Fifteenth General Assembly of the International Astronomical Union, held in Sydney at the end of August. The paper ended up with the name 'Astronomy 73', after the astronomers had rejected 'For those who trust the stars', 'Daily Planet' and 'Stardust'. At Health, Jack will be publicising the work of the National Health and Medical Research Council. He has been with CSIRO for nearly five years and during that time has been responsible for many publications. He also edited Industrial Research News from 1971 to 1972.

Canberra girl to study in England

Ms Madeline Mould, 24, a technical assistant in the Division of Plant Industry, left Canberra last month to undertake a year of study at the Gloucestershire College of Agriculture.

Madeline has been awarded a Rotary Foundation grant, having been nominated for the honour by the Rotary Club of Cooma. The award itself comes from the Trustees of the Rotary Foundation in Evanston, Illinois.

While she is away, Madeline will visit the United States and apart from her studies, will speak about her work to Rotary Clubs in south-west England.

At Plant Industry, Madeline works on research on rhizome bacteria applied to legumes, a subject of special interest to her home district of Monaro.

New Faces at Environmental Mechanics

The Division of Environmental Mechanics has had the welcome mat out for new faces around its Canberra offices in recent weeks.

Professor Edward E. Miller arrived on a three-months visit to the Division in August as a Pye Fellow. Dr. Miller is from the University of Wisconsin, USA, where he holds a joint appointment in the Departments of Physics and Soil Science.

While at the Pye Laboratory, he will be working on the transport of water and energy through soils and plant canopies.

Dr. Miller's past research activities include scaling and hysteresis of porous media, optics of plant canopies and computer modelling of watershed hydrology.

Outside the laboratory, Dr Miller is well-known as a wilderness enthusiast and environmentalist. His wife, Midge, who has not been able to accompany him on this trip, is an elected Representative in the Wisconsin Legislature and is a noted campaigner for a stronger political voice for women.

Edward E. Miller

Dr Ido Seginer

The second Pye Fellow, Dr Ido Seginer, Associate Professor, Faculty of Agricultural Engineering, Technion (Israel Institute of Technology), Haifa, has begun a 12-month visit to the Division.

Dr Seginer was born and educated in Israel and received his Ph.D. in agricultural engineering from Cornell University in the United States.

In Israel he has carried out extensive research in the physics of sedimentation and soil erosion. His current work is in the field of micrometeorology, particularly the aerodynamics of crops and windbreaks. He will be carrying forward these studies in the Division's newly commissioned Pye wind tunnel.

SAFETY NOTES

The Hardy Perennial

We have at least one each year — you can rely on it. He's the chap who fiddles with the lawn mower while it is still running.

An attempt we know of to refit a tyre which had come off resulted in a badly gashed and broken finger.

Always stop the mower **before** clearing blockages, making minor repairs, etc. Check the blades and attaching bolts — a flying blade is a deadly weapon.

Do not mow with children in the vicinity—a rotary mower can eject stones like bullets.

Near miss

An extract from a letter recently received:

'While testing a piece of electrical equipment I measured the voltage across two output terminals as 25 volts DC and consequently I did not take special precautions when handling the instrument (an amplifier). A later check revealed that one terminal had an earth potential of +400 V, while the other had an earth potential of +375 V. There is no need to elaborate on the possible outcome of accidentally touching either of the terminals; and this highlights the importance of caution when handling any electrical equipment.'

—J Hallam, Safety Officer.

New Ph.D.

Mr Frank Wilson, who until his retirement last year from CSIRO was officer-in-charge of the Sirex Biological Control Unit in England, has been granted the degree of Doctor of Science for his work in the field of entomology. The degree has been awarded to him by the University of London.

If sunbeams were weapons of war, we would have had solar energy long ago.—Director of the British Association, Sir George Porter.

Lunar name for CSIRO scientist

A former member of CSIRO is to have a feature on the moon, possibly a crater, named after him. He is Dr Joseph Pawsey, who founded the radio astronomy group of the Division of Radiophysics.

The decision to honour him was made at the General Assembly of the International Astronomical Union which met in Sydney at the end of August.

Dr Pawsey was well known in the field of optical astronomy, in ionospheric research and in many applications of radiophysics techniques. He had just resigned from his post (in 1962) with the Division and taken up a position as Director of the American National Radio Astronomy Observatory at Green Bank in West Virginia, USA, when he became ill and later died.

Dr Pawsey joined CSIR in 1940 and was instrumental in building up a strong research team concerned with the practical and urgent problems of producing effective radar systems for the armed services and in investigating some of the more fundamental aspects of radio wave propogation and radar detection as was practical in wartime conditions.

His own particular area of research in those early days was concerned with lightning flashes and later he became involved in solar research.

By the time he was 50, Pawsey was called 'the Grand Old Man' of radio astronomy and he had built up a scientific group which even then had made considerable contributions to science and had become well known and respected throughout the scientific world.

Only two other scientists from this part of the world were recommended by the IAU for similar honours — John Tebbutt, an early amateur astronomer in New South Wales who made significant contributions to his science, and the New Zealander, Lord Rutherford.

Regional Administrative Office, Canberra — new location
CAGA Centre
Akuna Street

Canberra's Regional Administrative Office, the Writing and Production Services Group of the Central Communication Unit, the Conference Group, Rural Research Group and Keith Martin of the Film Unit, have all moved from their offices in the AMP Building in Canberra to the CAGA Centre in Akuna Street. A landmark if you're looking for us (and that includes 'Coresearch') will be Electricity House. Or head for the Monaro Mall, look beyond the car park and the new building behind it will be us.

If Canberra weather continues to be as unkind as it has been lately, you may need to wear gumboots to reach us, but we are assured that, given time, we shall be cosily ensconced in our new premises.

The RAO's address is now Box 500, Civic Square P.O., A.C.T. 2608. Their phone number is 48 4211, telex code is 62528 and telegram code is Raocanb. The Central Communication Unit's address remains P.O. Box 225, Dickson, A.C.T. 2602.

Indonesian laboratory

Cont'd from page 1

and animal husbandry emerged after careful consideration of many factors.

Animal stock

The production of eggs and meat per bird in the poultry industry, they found, is currently very low but the industry is nevertheless an important one since it provides a source of protein at very little cost.

The village chickens live as scavengers and are generally not given shelter, but instead, roost in the trees. A meal in a village restaurant anywhere in Indonesia is testimony to the small amount of meat that is to be found on the scraggy birds.

There are, however, about 65 million poultry in Indonesia and about 41 million of them are on Java. There are a few commercial poultry farms, with most of them directing their interest to broiler production which can be a profitable enterprise when supplying the higher income bracket.

Imported strains of chickens would not necessarily be more productive than local birds under village feeding and husbandry conditions. A breeding programme needs to be instituted but changes in poultry feeding and husbandry practices are also necessary. At the same time similar work could be done on ducks.

There are about 7.8 million goats (80 per cent of them on Java) and four million sheep in Indonesia, but the goats are rarely milked and the sheep seldom shorn. Both are produced under primitive systems of husbandry and are often seen being herded by children along the roadsides. Breeding research and husbandry studies with both these animals could lead to an increased production of meat.

Religious prejudices against pig meat might limit the development of a large pig industry in Indonesia, but in places like Bali, which is predominantly Hindu as opposed to Java's Moslem faith, and in some of the Christian areas like South Sulawesi and North Sumatra, the pig numbers are high with a total population of about two million.

Buffaloes currently provide a significant part of Indonesia's meat consumption but very little research on the industry has been undertaken.

While every inch of earth on Java is precious to its overcrowded and continually expanding population, the outer islands have large tracts of unused land which could prove good areas for the industry. The Indonesians are anxious to improve their stocks and the teams felt that this was another area worthy of support from the Australian project.

'Steady on, Charlie! It's on the protected list.'

Rivett Medal

Dr John Raison of the Plant Physiology Unit, Division of Food Research, Sydney, has been awarded the 1973 Rivett Medal. The award, one instituted by the Officers' Association, was presented to him at the Rivett Lecture in Adelaide last month in recognition of his outstanding contribution to knowledge of the function of membranes in plant and animal cells.

This work provides a completely new understanding of the way many plants and animals suffer injury and even death when exposed to low temperatures, yet other plants and animals can tolerate such conditions without distress.

Bogor, where the BARI laboratory is to be set up, lies almost due south of Jakarta on the island of Java. It is about 35 miles from the capital and is reached by a winding road. Bus services connect with the capital, but the Indonesian ideas of bus services may not necessarily match those of metropolitan Australian cities.

Bogor is an ancient city, the site of the old Sundanese Kingdom during the 12th to 16th centuries. The Dutch took the area over in 1745 and their influence on its architecture is still obvious.

The city has a population of about a quarter of a million people and has a reputation for being the scientific centre of Indonesia. Consequently there is also quite a large expatriate population.

Bogor is backed by high mountains, is cooler than Jakarta and has less humidity than the coastal regions. One of its most famous features is its botanical garden which has an international reputation.

The national language, Bahasa Indonesia, is spoken there but Javanese is also widely used.

English is the second language of Indonesian secondary school children but not many become really fluent in it. Bahasa Indonesia, however, is not a difficult language to learn and is a distinct advantage to have, especially from the point of view of friendship.

Engineer does own aerial testing

When Peter Taylor, leader of the Agricultural Machinery Group of the Division of Mechanical Engineering at Highett, wants to test equipment in the group's programme of research into problems encountered in the aerial spraying of liquids and the spreading of fertilisers, he has an advantage over most people . . . he can fly his own plane and do his own experiments.

A former wartime instructor with the RAF, Peter likes to keep his hand in with flying.

As he said, he wasn't exactly complaining when it was suggested that CSIRO should look into the problems associated with aerial topdressing and that his unit should be the one to do it.

There have been a few moments, however, when he was not quite so sure that it was all a good idea. Back in December 1971 for instance, he was given permission by DCA to carry out some flying experiments on the airfield at Benalla in Victoria.

'The idea of going there was to take advantage of more stable weather conditions north of the Dividing Range and supposedly little traffic. The only thing was the same area was used by some enthusiastic members of the local gliding club . . . after some dodging tactics had been employed we mutually agreed who would fly where and when!'

The ultimate object of the programme is to produce recommendations regarding spraying techniques, the type of equipment best suited for the work, and its arrangement on the aircraft.

'Our recommendations should enable aerial operators and farmers to achieve the top biological result in an effective and economical way — that is, the minimal waste of material, minimal risk of damage away from the target and minimal pollution of the atmosphere and streams,' Peter said.

The work has been divided into three areas, simulation studies, nozzle characteristics and field experiments.

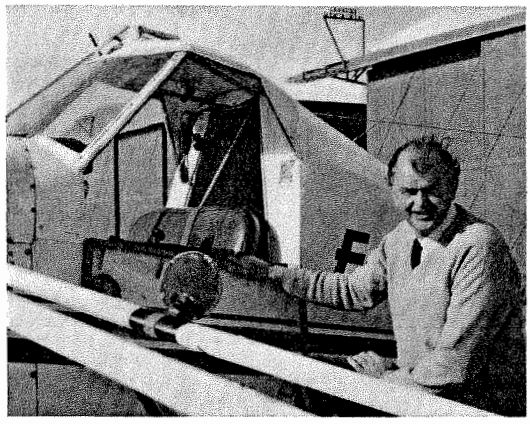
In the first, simulation by mathematical modelling was done to understand the behaviour of droplets released from aircraft spray nozzles. The influences of the aircraft, the air disturbances it causes and the meteorological conditions all had to be taken into account.

Measurement in the laboratory of nozzle characteristics has been started to determine droplet size ranges and flow rates in relation to supply pressures and liquid properties, but the apparatus currently used is only suitable for the smaller sizes of nozzles used on aircraft or with ground operated machines.

Complementary to the simulation and laboratory work, field experiments which could determine the distribution pattern and volume recovery were carried out with Pawnee aircraft.

In the research involving the aerial spreading of solids, some of the work on an aerodynamic type of spreader called a tetrahedron was partly carried out by the Aeronautical Research Laboratories before the unit's programme was started. Later at Highett, the optimum shape was determined from a series of model tests and then a full-scale version was built by Aerial Agriculture Ltd, Bankstown.

'Our field tests exceeded our expectations,' Peter said. 'We're now considering a smaller version to suit the Pawnee aircraft as well.'



Although the programme was only scheduled to last for three years, further work is considered necessary.

'And then for aerial applications, a comparison of aircraft needs to be made, and arrangements of spray-gear and flying techniques need to be further tested. All of this will give us improved effectiveness in spraying and will reduce dangers of drift and pollution.'

When completed the research will be of value to the community, the producers and to the 63 active aerial top dressing operators in Australia.

In 1972 they treated 10.6 million acres, an area which grew from two million acres in 1958 to more than 16 million in 1965. From then on it declined through droughts and recessions to the low 1972 figure, but by all accounts it will be higher this year with the general improvement in primary industry.

The relatively small band of operators has so far put up $15,000 towards the cost of the programme. As well as assisting with the field experiments, they help to guide the programme through their representatives on the Agricultural Aviation Research Committee.

'The programme is due for completion at the end of this year,' Peter said, 'but the Research Committee is taking steps to keep it going. The Division is prepared to maintain its support at the present level, but we feel more financial assistance is needed to make substantial progress.'

1973-74 Budget

The 1973-74 Budget brought down by the Government provides a total amount of $93,592,200 for CSIRO's annual and capital expenditure, of which $79,222,000 will be provided directly by the Government, $11,470,300 by Rural Industry Committees and $2,899,900 by various other contributors.

Treasury funds

Of the amount of $79,222,000 from Treasury appropriation, $65,500,000 will be for salaries and general running expenses, $12,822,000 for capital expenditure and $900,000 for repairs to buildings. The allocation for salaries and general running expenses represents an increase of $7,443,528 over the actual expenditure for 1972-73. This increase will cater for the following requirements:

- Increments, reclassifications, payments in lieu of furlough, additional week's recreation leave and salary adjustments arising from arbitration determinations are expected to absorb $4,113,000.
- The planned development of high priority projects initiated in earlier years will absorb $1,038,000. The activities in this category are:

  Fisheries and oceanography
  Mineral exploration
  Grain storage.

  Included in the above figure of $1,038,000 is an additional amount of $150,000 for the development of research projects to the stage of practical application.
- Twenty-four new projects for which $667,000 has been provided will be started during the year. The more important of these are:

  Cotton research, water and waste water treatment, protected proteins, biological control of weeds, grain nitrogen, built environment, manufacture of polymer materials, solar energy, navigational aids, atmospheric pollutants, crop adaptation, technology of cutting wear and abrasion.
- Additional support for current research programmes including computing mathematical statistics, research services and administration will cost $516,000.
- An amount of $123,000 has been set aside to meet increased grants for such bodies as the Standards Association of Australia, the National Association of Testing Authorities and Research Associations.
- To cope with the increased cost of goods and services due to price rises in the past year and service costs for new accommodation including cleaning, light and telephone, a sum of $1,026,000 has been provided.

The capital allocation from Treasury sources is divided into three categories: those works under the control of CSIRO, those controlled by the Department of Works and those handled by the Department of Services and Property. The first group of items totals $5,700,000. This will be spent on developmental work at field stations $500,000; the purchase of major items of laboratory equipment $1,050,000; the development of a new area of land provided for the Ginninderra Field Station $20,000; the new Cyber 76 Computer $4,100,000, and preliminary expenses associated with the planning and design of an oceanographic research vessel $30,000.

Of the $6,100,000 provided for building projects under the control of the Department of Works, $5,500,000 will be needed for buildings under construction at the end of 1972-73 while the remaining $600,000 will cover new works to be started during the current year. Those items costing more than $100,000 included in the 1973-74 New Works Programme are:

Installation of chiller refrigeration system for Division of Food Research, North Ryde, $110,000; additional Laboratory Wing for Division of Radiophysics, Epping, $180,000; construction of Urban Studies Building for Division of Building Research, Highett, $165,000; extensions to machine shop and laboratory for Division of Atmospheric Physics, Aspendale, $136,000; erection of poultry unit and quarantine facilities for Division of Animal Health, Maribyrnong, $363,000; installation of insect-proof facilities for large animals for Division of Animal Health, Indooroopilly, $262,000; new laboratory for Division of Wildlife Research, Helena Valley, $268,000.

The acquisitions proposals which are handled by the Department of Services and Property include a new field station near Seymour, Victoria, for the Division of Animal Health at a cost of $375,000; an additional 11,080 acres of land adjoining the Woodstock Field Station near Townsville for the Division of Tropical Agronomy $71,000; and a small block of land adjoining the CSIRO property at North Ryde $24,500.

Other funds

The joint Commonwealth-Rural Industry funds provide a large part of the finance available to CSIRO from non-Treasury sources. In 1973-74 the total will be $11,470,300, most of which will be utilised for wool and meat research.

Wool Research Trust Fund $8,667,000; Meat Research Trust Fund $1,863,010; Wheat Research Trust Account $196,277; Dairy Produce Research Trust Account $266,563; Tobacco Industry Trust Account $275,100; Fishing Industry Research Trust Account $138,445; Dried Fruits Research Trust Account $58,380; Chicken Meat Research Trust Account $5,525.

Only a small proportion ($325,480) of these funds relates to capital items. The remainder, $11,144,820 will cater for salaries and general running expenses for current programmes of agricultural research except in the case of the Fishing and Dried Fruits Industries where funds have been provided for three small new projects. Other expenditure from grants and donations from commercial enterprises and Government departments will amount to $2,899,900. This will cover a wide range of collaborative projects involving most of the Divisions.

Summary of Estimates of Expenditure for 1973-74

	Estimates 1973-74 $	Expenditure 1972-73 $	Increase or Decrease $
Under CSIRO control:			
Salaries and general running expenses	65,500,000	58,056,472	7,443,528
Buildings, works, plant and development items	5,700,000	1,852,513	3,847,487
Total under Direct Control of CSIRO	71,200,000	59,908,985	11,291,015
Under Department of Services and Property control:			
Acquisition of sites and buildings	854,000	428,500	425,500
Under Department of Works control:			
Buildings and Works	6,100,000	2,841,113	3,258,887
Furniture and fittings	168,000	168,039	— 39
Repairs and maintenance of buildings	900,000	667,731	232,269
Total CSIRO — Treasury funds	79,222,000	64,014,368	15,207,632
Contributory Funds:			
Salaries and general running expenses	13,820,500	13,279,516	540,984
Buildings, works, plant and development items	549,700	408,660	141,040
Total Funds CSIRO — All Sources	93,592,200	77,702,544	15,889,656

To the Editor

Sir—

To me it is sad to read in Coresearch 171, under the heading 'Nine-day fortnight for trial', the patent absurdity 'Surveys will be carried out before, during and after trials to ascertain staff attitudes to the total working situation'. This could mean 'A survey will be conducted to find out how the staff regards the new arrangement'.

I was at once reminded of an ex-politician who was fond of 'at this point in time' for 'now' and of an associate who has spoken of 'in the plant situation' for 'within the (living) plant'.

It is beyond my comprehension that people wish to padout with ponderous asininities their writing or their speech. It is as though they want to avoid, by all means, the feat of making a simple statement. To the perceptive reader or listener such succeed only in making high-grade fools of themselves; the message gets lost in the verbiage.

—P. R. Maguire,
Food Research Laboratory,
North Ryde.

Third year fitting and machining apprentice, Ian Marwick of the Division of Applied Chemistry, receives a bronze medallion during Melbourne's Apprentice Week from the State Minister for Labour and Industry, Mr. J. Rafferty. Ian's award came as recognition for his construction of a micro ceramic testing machine.

Credit Society

Or, all you ever wanted to know about interest rates, but couldn't find out . . .

With the present atmosphere of uncertainty surrounding interest rates generally, depositors with the CSIRO Co-operative Credit Society are naturally wondering whether their interest rates will move.

Similarly borrowers are also in doubt wondering whether the directors will, in their well-known gestures of philanthropy, keep interest rates at their present low level or move them slightly.

The Directors wish to assure both depositors and borrowers that they have the matter 'under close surveillance' and as soon as the haze has cleared—which it hadn't done by the time this issue of 'Coresearch' went to press — they will be in a position to announce any changes in interest rates.

Ceres watchers

Did you by any chance take part in the occultation last month?

Or, to put it a different way, did you become a Ceres watcher?

If you did, then Dr David Dunham, Department of Astronomy, University of Texas, Austin, Texas, USA, will be delighted to hear from you.

For those not normally in the habit of star-gazing but who happened to notice something different in the heavens on the night of 4 September, an occultation of Ceres by the moon took place.

That is to say — if you aren't astronomically-educated — the moon passed in front of the asteroid Ceres, one of the more important minor planets.

The occultation was to be visible in the skies above both Australia and New Zealand and the University is hoping that any astronomers, professional or amateur, who made observations of that event will send them any information they can.

If enough observations were made, the University hopes to be able to gain a more accurate idea of the size of Ceres and possibly discover, for the first time, its true shape.

According to the Royal Greenwich Observatory, there will not be another occultation of one of the first four minor planets until July 1975 when Pallas will be involved.

'When Mulga Joe Went Dry'

Jock Currie (right), a painter at the Division of Building Research, Highett, has won the Bronze Swagman Award for Australian bush verse. Jock was presented with the award at the Grand Rodeo Ball in Winton, Queensland. His winning poem was entitled 'When Mulga Joe Went Dry'. Unhappily, there is only room for one verse but Jock would probably supply free copies to friends if requested.

I've humped my swag through Bunnaloo
Along the outback trails.
I've camped with sunburned swagmen who
Could tell the tallest tales,
But one could out-talk all the rest
Of maggers that I know.
Of all the tales I've heard the best
Were told by Mulga Joe.

For adventure, join . . .

Column Eight of the 'Sydney Morning Herald' has happily noted that the spirit of adventure is not dead. It quotes CSIRO's advertisement in Britain for entomologists '. . . to participate for part of each year in expeditions in Africa and elsewhere for the purpose of studying and selecting dung beetles'.

'Coresearch'

'Coresearch' is produced by the Central Communication Unit for CSIRO staff. Members are invited to contribute or send suggestions for articles. The deadline for material is normally the first day of the month preceding publication. Material and queries should be sent to the Editor (Dorothy Braxton), Box 225, Dickson, A.C.T. 2602, Tel. 48 4211.

Printed by CSIRO, Melbourne

coresearch 174

Produced by the Central Communication Unit for circulation among members of CSIRO staff

November 1973

New Chiefs Appointed To Land Laboratories

CSIRO has three new Chiefs of Divisions, all in the Land Resources Laboratories.

They are Mr R. A. Perry of Canberra, who has been appointed to head the Division of Land Resources Management in Perth, Dr A. E. Martin, who has become Chief of the Division of Soils, and Dr R. J. Millington, also of Canberra, who will take over as Chief of the Division of Land Use Research, Canberra.

The appointment has consolidated the changes in the Organization's research activities on land resources made last March.

These, in the main, grouped together the three Divisions as the Land Resources Laboratories. Provision was made at the time for the activities of the three to be co-ordinated through a committee of their Chiefs under the Chairmanship of the Chief of the Division of Soils, Dr E. G. Hallsworth.

At the time that appointment was made, Dr Hallsworth was to hold the dual role but in the light of increasing public interest in land use and the importance of environmental studies, the Executive now believes Dr Hallsworth should be free to give all his time to the integration of land research activities.

It also wants him to develop closer collaboration with organisations outside CSIRO on matters related to the research programmes of the laboratories.

His appointment as a 'free standing' Chairman left a vacancy in Soils and the Executive recommended this should be filled by Dr Martin who has been the Assistant Chief.

Another change has been made at the same time as the appointments for the Rangelands Research Group of Land Use Research. Because Mr Perry has been their leader since its establishment in 1971, it has been decided to transfer the Group to his Division of Land Resources Management. Although the Division will have its headquarters in Perth, most of the Rangelands staff postings will not be affected and their field stations will remain where they are.

Dr A. E. Martin

Mr Perry, however, will move from Canberra to Perth and has already begun commuting between the two cities. He will move to Western Australia permanently about Christmas.

With him will go Mr Justin Murphy, and possibly one or two other members of the Canberra staff.

A graduate (M.Sc.) from the University of Adelaide, Mr Perry joined CSIRO as a research officer in 1957 and has since established a world-wide reputation as an authority in arid lands ecology. He represents CSIRO on a number of national and international committees concerned with research in this field and is author or co-author of some 50 papers.

Dr R. J. Millington

His colleague, Dr Martin, graduated from the University of Reading in 1940 and became a Fellow of the Royal Australian Chemical Institute in 1952. He was awarded his degree of D.Agr.Sci. from the University of Queensland in 1959.

In 1940-41 Dr Martin worked with the Chemical Inspection Department of the UK Ministry of Supply and then became an assistant advisory agricultural chemist at the University of Reading until 1945. Following this, he was a lecturer in chemistry at the University of London and later a soil chemist at the Grasslands Improvement Station.

Joining CSIRO in 1949 he eventually became Assistant Chief of Soils last year.

Most of Dr Martin's research has been concerned with the study of nitrogen transformation in soils and he is author or co-author of some 35 papers in soil chemistry.

Mr R. A. Perry

The third member of the trio, Dr Millington, graduated from the University of Sydney and completed his Ph.D. degree at the University of Adelaide. He became a research officer with the NSW Department of Agriculture and went on to become a lecturer in agronomy at the Waite Agricultural Research Institute.

He was then employed as a research soil scientist in the US Department of Agriculture for a short time before becoming Associate Professor and later Professor of Soil Physics at the University of Illinois.

Since his appointment to CSIRO, Dr Millington has been engaged on research into environmental biology and is author or co-author of 70 papers in the field of soil physics.

John Cook, Division of Applied Physics, bottles some of his home brew at his home at Gosford. (Picture: Courtesy 'Sun-Herald', Sydney).

Nice work — if you can get it . . .

John Cook of the Division of Applied Physics won the double when he went to Forbes for the town's Vintage Festival. Not only was he there officially to judge the first National Home Brewed Beer Competition but on arrival he and his wife, Margaret, were asked to join the judging panel for the local beauty competition.

With the beauty assignment safely over, John settled down on his own in a quiet, locked room in the grandstand at the local showgrounds to taste 98 entries of home brews from all over Australia.

Asked by 'Coresearch' which had been the more interesting of the two tasks, John immediately invoked the Fifth Amendment and refused to comment.

He was however, happy to talk about the home brew competition.

'I didn't know it until afterwards,' he said, 'but I was told that the locals expected me to drink a glass of each beer and record my opinions. They were somewhat surprised when I emerged after six hours still sober from the effort.'

The entries came from as far away as Darwin —'The freight alone on one entry from there was $10', John said — and South Australia. Only Western Australia was not represented.

The brews proved to be a fine collection but with due modesty, John felt that his own recipe which has made him one of Australia's best home brewers, ranked along with any he tasted at Forbes.

And John ought to be able to say that with some right because he has not only successfully made beer but has written two books about the subject and is a recognised authority.

There were two sections to the competition, one for light beer and the other for dark. The overall champion was Mr V. Ireland of Burwood, Vic. who also won the light beer section, while the runner-up in the event was Mr W. I. Smith of Pymble, N.S.W. The dark beer section was won by Mr E. McNally, Sylvania, N.S.W.

When the official judging was over, John was invited to a workshop meeting of participants. 'They kept pouring me out glasses of their own special recipes and asking me to taste and comment,' he said. 'They were so enthusiastic about their hobby that eventually the organisers had to rescue me.'

Staff members in gaol

At the invitation of the Principal of the Education Centre at Pentridge Prison in Melbourne, Ron Hinde and Nick King of the Division of Applied Chemistry in Melbourne attended a meeting of 'A' Division's Current Affairs Club.

The CSIRO film 'Approach to Science' was shown and then Ron gave the club members a general explanation of the work of the Organization. This was followed by a second film 'Flight Line One' which deals with control burning in forests from aircraft and Nick spoke about bush fire control.

Both speakers said afterwards that the two and a half hour meeting had been extremely stimulating because of the infectious enthusiasm of the audience. Although there were only 12 men there, an incredible number and variety of questions were asked without any flagging throughout the meeting.

Ron and Nick would be happy to discuss their experience with any other Melbourne members of CSIRO who would be interested in taking part in the Pentridge scheme. 'If our audience was typical, others will be well rewarded by the keenness of their listeners.'

Appointment

Mr F. J. Whitty, Regional Administrative Officer, Sydney, has been appointed the Scientific Liaison Officer in London. He will replace Mr I. C. Bogg who will be returning to Australia in January.

Solar Energy Research

By Roger Morse

Chief, Division of Mechanical Engineering

Why is energy so much in the news — do we really have an energy crisis in Australia — what is the role of solar energy?

The energy crisis has really been imported from the United States and it is a manifestation of the very real energy problems that have arisen in that country, but it has been too readily assumed that our situation in Australia is the same.

Energy is vital to an industrialised community, and it has been shown that there is a direct correlation between the average per capita income in countries throughout the world and their per capita energy consumption. It therefore tends to be assumed that energy must be cheap and plentiful for an industrial economy to thrive.

This assumption is now being seriously challenged, because there is little doubt that it has led to energy waste on a grand scale, the 250 hp motor car being a good illustration.

Primary energy consumption in Australia is approximately one-third transportation, one-third electric power and heat at high temperatures, and one-third low grade heat, that is, heat at temperatures below 120°C.

The Australian problem — crisis is too strong a word — is that all our transportation and some of our other energy, in fact 50 per cent of the total, is derived from liquid petroleum products which are rapidly being depleted. We are now importing 30 per cent of these, and long before the end of the century we will be totally dependent on imports unless new discoveries are made. We need, therefore, to find an alternative and we do not have much time.

Huge reserves

Coal, both black and brown, is the primary energy source for three-quarters of our electric power and we have huge reserves which are believed to be adequate for hundreds of years if used efficiently. The environmental impact of large power stations will certainly need further study but there is nothing to suggest that the problems encountered cannot be readily solved. We are in the very fortunate position of not having to depend on nuclear power with its unsolved environmental problems.

Much of the energy that is required as low grade heat actually arrives in the home or factory as electricity, oil or natural gas, but it is in this area that solar energy is starting to make itself felt and could, with known technology, make an important contribution to the country's energy requirements.

Our solar water heating industry is small but efficient and produces well-engineered absorbers which are not surpassed anywhere else in the world. They provide heat at about 60°C and can be developed for applications up to 120°C for the manufacturing and process industries and for residences.

To obtain a picture of the possibilities for solar energy it is necessary to look at its characteristics: that it is intermittent and requires storage is obvious, that it is dispersed and available where needed without reticulation is sometimes overlooked.

Misunderstandings

But there are two characteristics which are widely misunderstood. The first is that the average annual insolation, or amount of energy available from the sun, in the centre of Australia is only 40 per cent above that of Melbourne, not enough to justify the extra cost of construction and reticulation from a remote solar installation in the Australian deserts to our coastal cities.

Secondly, there is no advantage, but on the contrary a big disadvantage, in focusing solar energy by parabolic or other concentrators. Concentrating devices can only make use of about 60 to 80 per cent of direct energy from the sun, the rest being lost through 'scattering'. Concentration can only be justified to obtain high temperatures for either power generation or other application, and this certainly does not appear to be a high priority area for Australia.

A committee recently appointed by the Australian Academy of Science reported that the most effective way that solar energy could meet some of the country's energy needs in the short term is in the form of low grade heat, and set a target of 10^{18} joules per annum, or 13 per cent of the country's energy needs, by the year 2000.

Synthetics

There is also the intriguing possibility of making synthetic fuel from cellulose, which can be regarded as solar energy stored in plant material. We could envisage a form of synthetic petrol made from wood chips on a perpetual cycle, the nutrient for the trees being recycled and the CO_2 for photosynthesis being produced by combustion of the fuel. The problems are enormous but it seems likely that this could produce another 13 per cent of our primary energy needs for 2000.

The prospect of a quarter of Australia's primary energy coming from solar energy within 30 years would be a challenging national goal, involving a wide cross-section of the community. It will need research and development by Government, academic and industrial laboratories, as well as investment and construction on a very large scale.

A wide range of disciplines will be involved, including biologists, chemists, economists, mechanical, chemical and systems engineers, meteorologists and physicists. The meeting in Canberra in June, called to discuss solar energy in CSIRO, showed that there were 50 people in 23 Divisions who were interested. Clearly we have the skills that could make a major contribution and provide the scientific lead in this important field.

In Melbourne recently an oil company executive, referring to the United States energy crisis, pointed out that Australia had a great asset in that it had time to avoid such a crisis. We could add the observation that time, like his oil, is also a wasting asset.

Young scientists

Younger members of three families of the Division of Textile Physics recently displayed work which won them prizes in the 1973 School Science Research Competition, organised by the Science Teachers' Association of N.S.W. for secondary school students. They were among about 35 prizewinners whose efforts were on show to the public at Macquarie University.

Peter D'Arcy (son of Mr R. L. D'Arcy) demonstrated a study of wave action on a model beach, Jennifer Baird (daughter of Dr K. Baird) showed details of pollen morphology of some native Australian flowers and Rebecca Lynch (sister of Dr L. J. Lynch) exhibited the results of studying some properties of Sydney's water supply at two access points.

Dr Lex Blakey, Assistant Chief of the Division of Building Research, is not playing hopscotch. He's proving you can stand on fresh concrete after only 20 minutes through using a 'vacuum dewatering' process whereby the mats (which you can see) are laid on top of fresh concrete and the water is sucked out. The process has just been introduced commercially in Australia by Readymix.

Gum trees for homesick Australians in Scotland

Over the years many members of CSIRO who have been in Scotland have visited the Macaulay Institute for Soil Research in Aberdeen. Most of them at some stage of their visit have noticed an Australian eucalypt growing near the walled garden and there's usually a touch of nostalgia for those who have not been home for any length of time.

The tree grows there as the result of the perseverance of Dr Dal Swaine (right) of the Division of Mineralogy, Sydney, who cheerfully (now) admits that he suffered from a solid dose of homesickness when he was at the Institute doing his Ph.D.

To keep his national links strong, Dal originally tried to have a wallaby or kangaroo installed but when those efforts failed he settled for a gum tree.

The seeds were supplied by Dr Don Martin, CSIRO, Hobart, who is particularly interested in the growth of eucalypts in the United Kingdom.

'We managed to get a number of seeds to germinate, but the trees usually died before they reached three metres in height,' Dal said.

'Finally, we managed to get one to survive. It's now growing in the garden along with a number of others of diverse origins and is apparently coping well with the rigours of the Scottish winter on the eastern coast.'

Dal gives much of the credit for the success of the venture to the former head gardener of the Institute, Mr H. Mann, but if it hadn't been for his own determination to have his gum tree, it is doubtful if anything would have come of the idea.

The tree probably *E. nitens* and now 10 metres tall, remains a sentimental link for Dal who, after he completed his Ph.D. studies at the Institute, later returned there as a member of the staff for eight years.

Aboriginal training scheme starts in Darwin

The Division of Wildlife Research has introduced a training scheme for Aboriginals in their Darwin laboratory.

Initially three young students will be taken on as trainee technical assistants for a period of two years.

During this time they will be rotated around the Division's various activities in the area, the present programme of the laboratory including surveys of fauna and their habitat preferences, studies on pigs and buffaloes, native rodents and the effects of habitat alterations on wildlife populations.

The Division envisages giving the men a broad training over the next two years in the different facets of both laboratory and field work so that at the end of that time they should be qualified to take employment with CSIRO or in other areas such as the National Parks and Wildlife Service.

During their period of training their salaries will be met by the Department of Aboriginal Affairs, who along with the Department of Labour, have been involved in the appointments.

Although this is the first time the Division has initiated a training scheme for Aboriginals, they have done similar training on a shorter term basis for Papua New Guineans.

Interest rates

The CSIRO Co-operative Credit Society has announced the following new interest rates for money held on deposit by the Society:

Class 1 (money deducted from salary) remains unchanged at 6 per cent p.a.; Class 2 (money on deposit for less than 12 months) — 6.5 per cent p.a. (previously 6 per cent p.a.); Class 3 (money on deposit for more than 12 months) — 7.6 per cent p.a. (previously 6.5 per cent p.a.); Class 4 (money on deposit for 5 years or more) — 7.75 per cent (previously 6.75 per cent). These new rates will be effective from 1 December, 1973.

Loan Interest: The interest rate for loans from the Society has been increased to 8.75 per cent reducing quarterly, also effective from 1 December, 1973.

No change

Although the CSIRO Conference Unit is now located in Canberra's new CAGA Centre, Akuna Street, the mail address for the Unit remains P.O. Box 225, Dickson, ACT 2602.

Apprentices honoured

For the second successive year, two apprentices from the Division of Chemical Physics have received Bronze Medallions from the Apprenticeship Commission of Victoria. They are Robert Cathie and Patrick Francis who received their awards for the outstanding exhibits manufactured by them in their respective trades. The Bronze Medallion is the highest award in each trade.

Robert Cathie, 21, a third-year apprentice in instrument making, designed and manufactured a machine tool centreing instrument known as a centricator, making all the components with the exception of the dial indicator. The quality of the design and construction of this instrument was the subject of special comments at the presentation of the awards.

Patrick Francis, 20, a third-year apprentice in precision optical finishing, made a glass cube in boro-silicate crown optical glass. The craftsmanship and technical ability required to manufacture such a cube to the accuracies achieved are normally shown only in craftsmen of many years' experience.

Each apprentice, in addition to trade course work, is pursuing a technician's course.

WILDLIFE SURVEY IN WESTERN ARNHEM LAND

The Division of Wildlife Research in Canberra has almost completed its fauna survey of western Arnhem Land in the Northern Territory. There will be some 'mopping up' operations to do in the next dry season and when all the laboratory work is finished there will be an assessment of the facts.

And the facts are likely to excite anyone in Australia — and overseas — who is interested in wildlife for, apart from the survey being the most extensive ever undertaken in the region, the team has made some important discoveries.

There was, for instance, the day Dr Dick Schodde from the Division in Canberra and Ian Mason from the Darwin laboratory of the Division, went fishing on a billabong near the South Alligator River. Ian threw in a line and hauled out a turtle which would have been interesting enough on its own, but on this occasion the turtle turned out to be a *Carrettochelys insculpta,* commonly known as the pitted-shelled turtle.

The turtle was long believed to be restricted to the southern part of Papua New Guinea and was not recorded in Australia until as late as 1969. Ian's specimen was only the second one ever collected in this country.

What made the discovery of even greater significance for the team was that investigations showed it had only recently laid eggs. This meant that it was now known to breed in Australia.

Survey origin

The story of the Arnhem Land survey goes back some years when the Division first began sending its staff up there on short expeditions.

'It was obvious to us even from those field trips and our preliminary observations that there was a wealth of fauna in the region,' John Calaby, the leader of the survey team, said.

'But the northern part of Australia is ecologically the least known part of the country and other than our spasmodic work and the field trips made by the Northern Territory Administration, there had been only three major wildlife expeditions into Arnhem Land up until then.

'We had just begun to take a detailed look at the area of the proposed Kakadu National Park when potential conflict arose between the interests of conservationists and the mining companies.

'The discovery of uranium called for a detailed look at the resources of the area and a fund was set up to allow a complete survey to be made. Our Divisions of Wildlife Research, Entomology, Applied Geomechanics and Land Use Research have all been involved as well as the Departments of the Northern Territory and Minerals and Energy and the Australian Mining Council. Almost every possible aspect of land use, including tourism, is being looked at.

'Our share of the money enabled us to make a complete year-round research programme and like the other interested parties we'll now present a full report of our activities.

'When these are all in, decisions will be made on the total land use of the area,' John said.

Team interests

From time to time various people have been involved in the wildlife survey, but in the main the members of the team have been John, whose interest has been in the mammals, Dick, who has investigated the birdlife, their habitat and the vegetation of the area, and Dr Harold Cogger from the Australian Museum who joined them to work on reptiles and frogs.

Others have included Tony Wolfe and Ian Mason from the Darwin laboratory, Peter Martensz from Canberra and rangers from the Department of the Northern Territory.

'The biology of the mammals and birds had never before been studied in the conditions of the "wet" so that much of what we learned was either completely new,' John said, 'or confirmed predictions'.

A number of animals which were previously thought to be extremely rare, have turned out to be quite common. For example, one of the marsupial mice, previously known from only three specimens, was considered to be among the 'almost-unknowns' of Australian wildlife, but the men found it was common for a hundred miles or more along the Arnhem Land escarpment.

'We succeeded in trapping about 100 of them for further investigation,' John said.

The area is rich in species of marsupials, bats and rodents, some of which are endemic to the region. Before the survey, though, no more was known of some of them than the appearance of their dried skins in museum collections.

Now the team has considerable knowledge of the habits and breeding biology of a much wider range of animals, including the rock possum whose nearest relatives are found in the Atherton rain forests and the New Guinea highlands, and the rock wallaroo that lives on the steep escarpments and has a number of features not shared by any other kangaroo.

Northern native cat *(Dasyurus hallucatus),* a common animal in the Alligator River region. (Pictures: Ed Slater).

Harney's marsupial mouse *(Antechinus bilarni)* a rock-inhabiting species known only from the western Arnhem Land escarpment.

Discoveries

During the course of the work the nests of several birds were discovered for the first time. The birds themselves were known to exist but little was known about them biologically and neither their eggs nor their nests had previously been seen.

The discoveries included two rare pigeons, the banded pigeon and the red quilled rock pigeon, the nests and eggs of which were found for the first time. Another significant find was the nest and eggs of the white-throated grass wren, the most richly coloured of Australia's grass wrens and known previously from only a few records and only on the Arnhem Land plateau.

Dick and Ian also came across the nest and young of a white lined honey-eater, another first, for although the bird was known, the young was one of those never before seen by Europeans.

In the reptile field, Dr Cogger and one of the rangers, Dave Lindner, discovered a number of undescribed reptiles and frogs which up until recently were not known to science.

Crocodiles were seen by the party but only the small freshwater species were in any number and the 'salties' were extremely rare.

Habitat

Describing the area in which they were working, Dick said that the land offered a variety of habitats. For the most part it was fairly open eucalypt woodland with patches of open forest and small pockets of rain forest.

'What made it so interesting though, was the fact that at one place you'd be among bare rocks and spinifex in arid conditions and the next moment you'd be in a patch of rain forest. It's a great mosaic of different vegetation types.

'The escarpment, which you hit about 160 miles from Darwin, is a spectacular geological feature which also makes for a pretty exciting place to do our sort of work.

'But you wouldn't say that working up there, especially in the wet, was climatically the greatest joy you could ask for. The temperatures are usually around 32 to 34°C and not much of a drop at night. There is a lot of rain and the mosquitoes are most certainly not an endangered species when it came to numbers.'

There is also the hazard of bush fires which, for instance, the team experienced last month when Keith Martin of the Film Unit staff was up there with them. On that occasion, the men were out setting traps when they noticed a fire, safely, as they thought, in the distance. Within an hour or so it had swept through more than 30 miles of bushland and as the men said laconically, 'It came a little close for comfort'.

Rock paintings

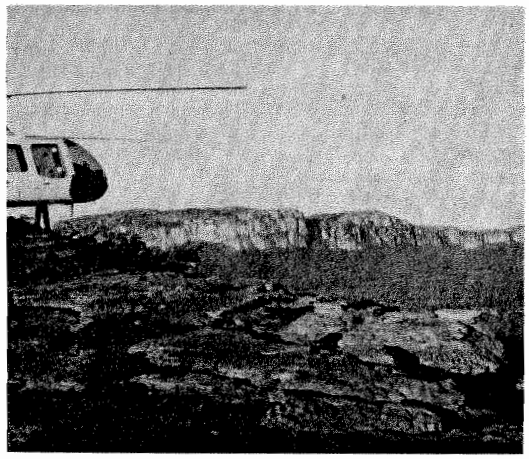
One of the bonuses for the party came with the realisation that the land was rich in traces of early Aboriginal occupation.

'We came across a number of places where bones of the dead had been placed in rock crevices.' John said. 'We learned that it had been a custom of the tribes living there to expose their dead until the flesh had gone from the body. Some of the bones were then gathered and placed for safekeeping among the rocks.

'We also discovered a great many rock paintings. In fact, I'd say that in one day you could see more such paintings up there than you would find in the whole of New South Wales and Victoria put together.

'It's our belief that some of these have never been seen by Europeans, and that this area is one of the great primitive art centres of the world.

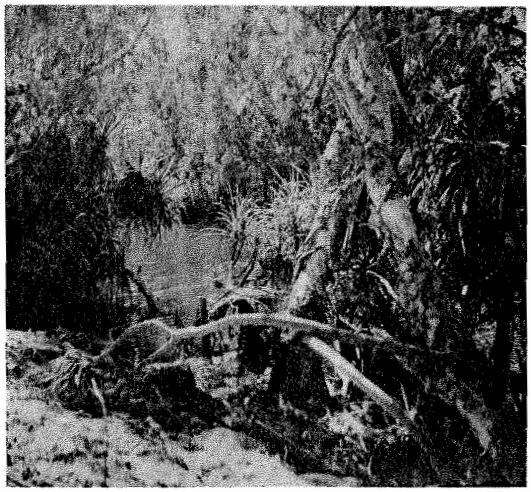
'If the proposal to have a national park there becomes a reality, it would be essential that strict controls be placed on such areas to preserve the paintings and other relics of aboriginal culture for all time.'



A helicopter approaches the western Arnhem Land escarpment. (Picture: R. Story).

One of the Aboriginal rock paintings of a turtle found by the team.

John Calaby (right) and Tony Wolfe examining a trapping site in long grass which almost envelops him near the escarpment base at the beginning of the dry season (Picture: Ed Slater).



A typical area in a rain-forest region of western Arnhem Land. The habitat for wildlife in this area varies considerably with that in the pictures above and left. (Picture: R. Story).

Finding People in CSIRO

By Clive Hackett

The author argues that our methods of locating expertise in CSIRO are inefficient. He asks whether we would allow information about our skills to be stored on a CSIRO data bank

One of the 'in' words in CSIRO this year has been 'communication' — communication with the Australian Government, with the staff and with society at large.

Discussion has mostly centred around the absence of channels for communication or blockages in existing ones. But there is another form of the problem, one which has received little discussion but is there all the same. It is the difficulty of quickly locating people in CSIRO who have information you need.

Let's first consider how the Secretariat can experience this problem. Say that Foreign Affairs rings Head Office one morning and announces that a place has suddenly become available for a CSIRO soil scientist who speaks Portuguese to join a delegation to Brazil. The delegation leaves in seven days and will be discussing the effects on the rain-forests of the vast programmes for the inland regions.

When this message is received, people will first ask around locally. If they come up with a name, just one, that person will probably be contacted direct. If he's free and his Chief agrees, he's probably as good as on the plane, whether or not he's the only CSIRO soil chemist who speaks Portuguese.

If this first search yields no names at all, the Secretariat will start telephoning long-distance and using the telex. A dozen such urgent messages would have to go out, to cover all the labs containing soil scientists, and a dozen people would start running around on receipt of them. If the Secretariat was unlucky, two or three names might turn up. A choice would then have to be made, perhaps with some delicacy.

If such information had been available on a computer, a large amount of time would have been saved.

Now let's see how the scientist can experience the problem. A scientist and his assistant together stumble across a property of radio waves which might make it possible for aircraft to scare off birds in their path at take-off and landing, without fouling up radio navigation devices. Since they missed the article in Rural Research on this problem — and the information that aircraft engines must be capable of withstanding a 4 lb chicken at 400 mph — they would start talking to people. They would be looking for those in CSIRO who know something about at least two of the following subjects: bird physiology, existing bird-scaring techniques, radio waves, aircraft construction, and airport regulations.

According to their energy and luck, the team would find sufficient help in a week or a month. But their search would obviously have been hastened if they could have consulted a data bank.

Some will argue about these examples, but the existence of the problem can hardly be disputed. I think it will become more serious as our involvement with environmental problems increases and as we acknowledge the connectedness of all the problems we handle.

One form of accessible data bank does exist already in CSIRO, in the form of the handbook 'Fields of Activity in CSIRO Research', which is updated at least once a year. But this production has at least one major limitation, in that it does not list expertise, only activity. So perhaps only 20 per cent of the potentially useful information appears.

To add the other 80 per cent to the handbook might make it unmanageable or uneconomic, but such a store of personal information could be filed and searched on the CSIRO computing system.[1] The cost of setting up such a store on the computer and maintaining it would have to be carefully assessed, but the prime question to my mind is whether we would be willing to supply information for storage in this manner.

Some may respond negatively because they would like to stay under cover — fewer interruptions, fewer red herrings, and fewer chances of having to admit ignorance. I sympathise with this view, but I don't think society will tolerate it much longer. So it may be wiser to lift the cover voluntarily than under duress.

Others might be willing in principle to co-operate but might believe that the information could be used against us somehow. I acknowledge this problem but lack the Watergate mind to see how. Much of the information is already on file. The only additional elements would be extra-mural skills or interests which could be brought into play at short notice — e.g. knowledge of languages, accounting, antiques, etc. The safeguards would be voluntary provision of information and universal access to it within CSIRO.

A recent report[2] has stated that scientific and technological information resources are very poorly developed in Australia, for finding people as well as publications. CSIRO is no exception in the former respect. In terms of the old saying about hiding lights under bushels, the question is whether you would be willing to move your bushel over a bit?

[1]INFOL2, DCR Technical Note 40, by N. R. Pummeroy, June, 1973.

[2]Report of the Scientific and Technological Services Enquiry Committee— Chairmen Sir Peter Crisp and Sir Samuel Jones — see summary in 'Search' August 1973, p. 313.

Footnote: When Dr Hackett submitted the above article to 'Coresearch' he sent advance copies of it to various members of the Secretariat. Some of these people while appreciating Dr Hackett's views, have now indicated that they would like to reply to the article. These will be published in the December issue. — Ed.

Mr Alan Richardson who is on secondment to the Australian Wool Corporation from the Division of Textile Physics, recently arranged for a party of scientists and industrial representatives to visit the Clunies Ross Animal Research Laboratory at Prospect, Sydney. Alan Downes, Kevin Ward and Ralph Chapman gave an outline of the Laboratory's chemical defleecing programme and the various methods of approach to the problem. Later the visitors saw two sheep defleeced in rather less than a minute apiece. Tony Holmes (centre), an accomplished shearer by conventional methods, demonstrated how easy the job could be if chemical defleecing becomes a commercial proposition. He is watched by Dr Peter Booth, AWC (left) and Mr Richardson.

Engineer helps on bridge problems

Dr A. R. Toakley of the Division of Building Research has returned to his desk at Highett after a period of 20 months with the Lower Yarra Crossing Authority.

Dr Toakley was seconded to the Authority's Directorate of Engineering and worked as Chief Design Engineer in charge of a group of engineers and draftsmen who had the task of redesigning West Gate Bridge in Melbourne following the failure of the original bridge in 1971.

He also deputised for the Director of Engineering on several occasions when he was overseas and visited Europe himself on their behalf.

In a letter to the Chairman, Dr J. R. Price, the Chairman of the Authority, Mr O. G. Meyer, expressed his appreciation of the work that Dr Toakley had done. He also thanked the Organization for allowing an outside State body to have the services of one of their staff.

Ms Lyn Bosworth, left, and Ms Marilyn Wannan, two of a small group of women on the technical staff of the Division of Applied Physics, exhibit a peggy square rug the group has made to raise funds for their pet charity, the children of Dr Barnardo's Homes in Sydney. The women spent many hours knitting the squares which were then crocheted round and joined up. The group has actively supported the children for several years and last year their efforts netted $300.

International awards to two scientists

Two CSIRO scientists have been chosen for international awards by the World Meteorological Organisation in Geneva. They are Dr C. H. B. Priestley, Chairman of the Environmental Physics Research Laboratories, and Dr G. W. Paltridge of the Division of Atmospheric Physics.

Dr Priestley has been awarded the International Meteorological Prize jointly with Mr J. S. Swayer, Director of Research in the UK Meteorological Office. The award is the highest international honour in meteorology and this is the first time it has been given to a scientist working in the southern hemisphere.

It is awarded for the recipient's contribution to science and for his services to international meteorological organisations.

Dr Priestley's main research has been on the mechanism of atmospheric pressure changes and on the interacting processes between the atmosphere and the underlying land and sea surfaces. His work is regarded as being a cornerstone of modern approaches to climatology.

Dr Paltridge has been awarded the WMO Research Prize for 'The encouragement of young scientists.' It is given to the author of a single research paper considered to be of outstanding merit and originality.

Dr Paltridge's paper, 'A model of a growing pasture', provided a means of calculating and therefore predicting, rates of plant growth from atmospheric data on radiation, temperature, humidity and wind, measured above the crop.

Honour

Dr P. M. Robinson, Division of Tribophysics, Melbourne, has been awarded the degree of Doctor of Science from the University of Wales, Cardiff. Dr Robinson has recently returned from a four-months tour of the USA, UK and Europe where he looked at work going on in the hard metals area.

CSIRO ball in Canberra

The Head Office Social Club has staged one of its most successful annual balls with more than 1000 people attending the function. Among those present were the Minister for Science, Mr W. L. Morrison, and Mrs Morrison, the Chairman, Dr J. R. Price, and Mrs Price, and Mr Walter Ives, a former member of the Executive and now Secretary of the Department of Primary Industry, and Mrs Ives.

The ball was hosted by Mr Justin Murphy of the Division of Land Use Research, as Chairman of the Ball Committee, and masterminded by his secretary, Kim Jansen, and Harry Kwong, President of the Social Club.

When it was decided to make the function a BYOG affair and hold it in the Woden Plaza, a large shopping complex in the national capital, the prophets of doom were quickly at work. Dire warnings were forecast about the terrible things that could happen as people travelled up and down on the escalators either to dance on the plaza's large ground floor or to dine at their tables on the second floor.

As it happened no bodies finished spread-eagled on the floor but many plaudits were heaped on the heads of the organisers for a highly successful night.

'Coresearch'

'Coresearch' is produced by the Central Communication Unit for CSIRO staff. Members are invited to contribute or send suggestions for articles. The deadline for material is normally the first day of the month preceding publication.

Material and queries should be sent to the Editor (Dorothy Braxton), Box 225, Dickson, A.C.T. 2602, Tel. 48 4478.

Printed by CSIRO, Melbourne

coresearch

175

Produced by the Central Communication Unit for circulation among members of CSIRO staff

December 1973

Shearers' long blow may become short pull

A method of harvesting wool from the sheep's back by chemical processes is being investigated by the Division of Animal Physiology at Prospect, Sydney. If the experiments being carried out there are successful, Australia could see a gentle revolution in its shearing industry — the first for nearly a century.

Behind the project is a team of scientists and technical staff, some full-time, some part-time, who have set out to try to solve the problems associated with both the costs involved in shearing and the difficulty of getting qualified shearers to do the work.

Mr Alan Richardson has been seconded to the Australian Wool Corporation from the Division of Textile Physics to co-ordinate all aspects of the wool harvesting project and Alan Downes, Peter Reis, Ralph Chapman and Kevin Ward from Animal Physiology have formed a research team to investigate chemical and biochemical methods of defleecing sheep.

'We're looking for the perfect agent,' 'Coresearch' was told. 'It has to be reliable, safe and cheap, and it has to stop the growth of wool for the shortest possible time.'

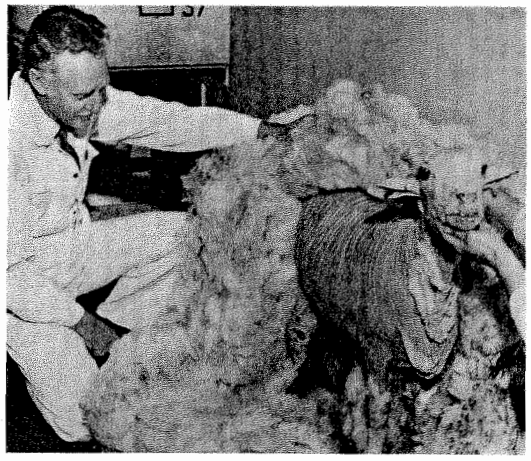
Another member of the staff, Bill Panaretto, who was studying stress in shorn sheep, became involved because the steroid hormones he was working on had an interesting side effect — steroid-treated sheep subsequently lost their fleeces.

This finding has led to a method which is being studied closely — the injection of synthetic steroid hormones imported from overseas. In some sheep, this causes wool to loosen in such a way that the fibres can very simply be plucked by hand. In theory, the idea sounds feasible and has the potential for success, but before the team will start proclaiming they have found a practical answer to the wool industry's prayer, it has a great many more tests to run.

'In the first place,' Mr Downes said, 'we have to determine the effect of the drugs on the animals. That in itself requires a tremendous amount of work because we have to approach it from a number of different angles. It not only has to do the defleecing satisfactorily, but it has to be safe to use so that the animal will not be harmed either in its meat production or reproductive potential, or in any other way. And those are tests you can't do in five minutes.'

In a tour of the sheep pens, Bill Panaretto showed 'Coresearch' how some of the steroid hormones which had been tried reacted. The fibres on one animal's back came off at the slightest touch and with absolutely no discomfort to the sheep. It didn't even know the wool had been plucked. But — in the bare patch that was left from a previous similar test 'harvesting', the new wool had so far not started to come through after several days. One question the researchers had to answer was how long it would be before the wool started to grow again.

'No farmer is going to appreciate it if he loses, say, a month's growth,' Bill said. 'What we have to discover with that drug is whether the amount injected should be less or more, how often it needs to be given, and the best possible method of injection.'



A member of the wool harvesting project, Peter Reis, with a sheep which has been chemically defleeced. The longer wool around the neck shows where defleecing was less effective.

Moving to another sheep which had been given a slightly different hormone treatment, he demonstrated how its 'bare patch' had the beautifully soft downy appearance of new wool coming through. 'Now that looks perfect,' he said. 'But watch . . .'

Giving the fleece a light pull he showed that it did not come away from the animal with quite the same ease as had the first one. 'Now the animal felt that,' he said. 'Only slightly, but that's not good enough. We've got to do more tests to overcome that.'

Turn to page 3

Credit Society wants more money invested

More investors in the CSIRO Co-operative Credit Society are urgently needed so that the heavy demand for loans from the society can be met and the present delay for loans to be paid can be greatly decreased.

Short or long term investments by CSIRO employees and other members of their families and their relations will be welcome.

CSIRO employees are reminded that they are able to save with the society by regular fortnightly deductions from salary. Interest on these deposits is 6 per cent per annum and interest accrues from the day the money is invested.

After six months the interest rate is automatically adjusted to 6.5 per cent per annum. There is no charge for this service and the money is available at call.

Lump sums invested for less than 12 months also earn 6.5 per cent per annum and for more than 12 months but less than five years the interest rate is 7.6 per cent per annum: 7.75 per cent is paid if the term of investment is five years or more.

Forms for each type of investment are available from Administrative Officers in each Division or from the registered office of the society at 314 Albert Street, East Melbourne, 3002.

BUILDING RESEARCH PULLS OUT OF PNG

After 11 years the Division of Building Research is to close its branch office and laboratory in Port Moresby.

The move is in line with the Australian Government's policy of disengagement of Government instrumentalities from Papua New Guinea following self-government.

During the time the office was staffed, the Division of Building Research provided a total of six officers, who spent periods in Papua New Guinea ranging from three months of relieving duty to four years of service.

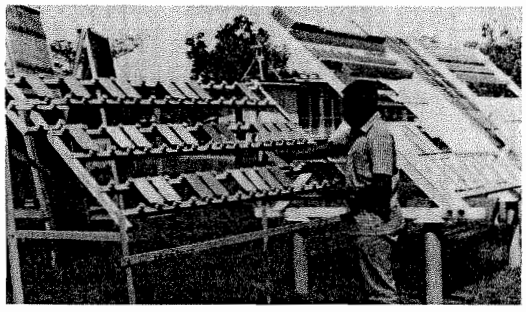
From its inception the office provided an information service on building and other matters, either by responding to questions or by issuing informative leaflets in its Tropical Building Research Notes series, some 60 of which were published. Questions for these came from missions, individuals, local and Australian Government Departments, and from overseas.

Studies were made of local materials such as clay, limestone, bamboo and sago palm, and advice was given to manufacturers of concrete masonry.

It is an ironic fact that although much of the land in Papua New Guinea, including many of the mountains, is largely composed of clay, very little of the material is immediately suitable for brick or pottery manufacture. Work by the last resident officer, Mr R. K. Hill, however, indicated that there were several promising deposits near Port Moresby, Lae, Goroka, Kainantu and Wau. The clay from Wau is of particular interest because it is 'white burning' and suitable for making porcelain.

One of the most sustained efforts was the recording of climatic data. Directional rain gauge records (monthly averages) were gathered for a decade at Lae, Goroka, and Port Moresby, while solar radiation intensity throughout the day was recorded for several years at Port Moresby and the results sent to the World Meteorological Organisation. The equipment concerned has been transferred to the Institute of Technology at Lae so that records of tropical solar radiation may continue despite the withdrawal of CSIRO.

A considerable amount of work on fungus-resistant paints and a long-term programme of exposure testing of plain and coated metals were among the other activities carried out by the Papua New Guinea office. It is interesting to note that the rate of corrosion of mild steel in Papua New Guinea is only about half the rate in Melbourne and a quarter of the rate in London.



Mr Ila Imani, a local assistant, checks specimens on the exposure rack at the Port Moresby laboratory of the Division of Building Research.

Two 'comfort surveys' were carried out by different resident officers. In these surveys people living in different kinds of houses recorded on cards how they felt thermally, how much air movement there was at the time, what they were wearing and so on. The first survey involved only expatriates, but the second, conducted this year, concerned indigenous people. It is hoped that the results will be of benefit to architects, builders and authorities responsible for housing in Papua New Guinea.

Some of the functions of the former branch office will be carried out by Papua New Guinea's Public Works Department, others by the Department of Forests and still others by the Institute of Technology at Lae. In addition, officers from the Division will visit Papua New Guinea from time to time for discussions as the need arises.

Fiji assignment

Dr F. J. Bromilow of the Building Operations and Economics Section of the Division of Building Research, Highett, visited Suva last month to hold discussions with senior officers of the Fiji Public Works Department. The visit was arranged under the South Pacific Aid Programme by the Department of Foreign Affairs at the request of the Government of Fiji.

Twice-a-year crops?

Science may change plant habits

Rivett medallist John Raison is a man who's going about his work these days well content that he's had professional recognition among his peers both at home and overseas.

He's also quietly confident that before long his research — of particular interest to scientists studying plant and animal psysiology — will soon have practical applications.

This could mean that:

- crops such as sorghum and maize could be harvested twice a year
- other crops could be grown in colder temperatures for longer periods without being injured
- fruit and vegetables such as tomatoes and cucumbers, which presently soon spoil in refrigerated conditions, could be stored in cool temperatures for longer periods.

Looking into the realms of possibilities, it may even mean that doctors could keep vital organs in healthy condition at low temperatures indefinitely for later use in transplants.

And in more than just the colloquial sense of 'way out' science, astronauts might be given a chemical injection to place themselves in a state of suspended animation or hibernation during long voyages into outer space.

US collaboration

The work which led to these considerations was started in 1968 when an American scientist, Dr James Lyons, Head of the Vegetables Crops Department of the University of California, came to Australia to study the differences between plants which are chilling-sensitive and those which are chilling-resistant.

He met Dr John Raison, a plant biochemist with the Plant Physiology Unit of the Division of Food Research, Sydney, who was already working on mitochondria, minute particles found in the cells of plants and animals which produce energy. After discussions, the two men decided to work together and from that day onwards, professionally John Raison has concentrated the whole of his efforts on work related to these studies.

And that research won for him the 1973 Rivett Medal.

'For many years, researchers have been trying to understand why certain plant and animal cells cannot tolerate for long temperatures which fall below a certain point — about 10°C for plants and 23° C for animals — while other plants and animals appear to be immune to cell damage at far lower temperatures,' John said.

'Dr Lyons and I began our studies in the hope of finding — and understanding — the changes that occur in both plants and animals when they are faced with adapting to or being injured by colder temperatures. The first step was to isolate the mitochondria from several plants in both areas and subject them to chilling temperatures—within the range of 10°C to 0°C. We discovered that while no change occurred in the chilling-resistant plants, one did occur in the chilling-sensitive plants at the critical temperature of about 10°C. (depending on the species of plant).

'The change caused damage to the plants' metabolism, depending on how long and how low were the temperatures. This led us to see whether the same thing happened in the animal world. We found there was a distinct relationship between the two.

'An extension of our observations showed that warm-blooded animals with the capacity for hibernation possess typically warm-blooded mitochondria when they're active, but once they go into hibernation they change to the mitochondria of the cold-blooded animal,' John said.

Research into the lipids (fatty substances) of membranes in chilling-resistant plants showed that they could be likened to margarine — at low temperatures they remained fluid.

'In chilling-sensitive plants,' he said, 'they're like butter. They remain solid.'

Award

The published data on their work earned for the men recognition by the American Institute of Biological Sciences. They considered it the most outstanding single contribution into research into the production of vegetable crops for that year and in 1971 awarded the scientists the AIBS-Campbell Medal and a cheque for $1500.

At this point John returned to Australia and with his Australian colleagues, began looking for practical applications.

Working first with the echidna or spiny anteater, which, it is generally agreed, goes into a state of torpor in the winter rather than true hibernation, John found that the animal could lower its body temperature in the winter and that as this process occurred the lipids in the membranes were modified to withstand the change in temperature.

When this and the earlier work was made known to scientists studying animal hibernation, there was considerable interest and it has given rise to a fresh impetus to look further into the changes in animals' metabolism using John's and Dr Lyons' data as the key.

Plant effects

In the world of plants, however, John and the others are now trying to find ways to simulate in chilling-sensitive plants, either by a chemical process or by plant breeding, the properties of the membranes of chilling-resistant plants.

If it's possible to change the lipid components in chilling-sensitive plants then those plants should be able to grow in a wider range of latitudes or for an extended season.

'This could have an important effect on crops like sweet potato,' John said, 'where it's used as the staple food of a developing country.'

While the Unit is concentrating on the biochemical aspects, collaborative work is being undertaken with colleagues at the University of New England, at the NSW Department of Agriculture and in a commercial nursery who are looking at plant breeding programmes.

John himself is more confident of success with the plant breeding project than with chemicals, but believes that a chemical could be developed which, when sprayed on to the fruit, would give them a longer life in storage. 'In other words we'd modify the plant at that stage of its development.'

He is at present organising a conference of scientists working in this field in both the United States and Australia for February, to be held in Hawaii and hopes that it will attract a number of researchers from both countries so that duplication of effort, which costs both time and money, can be forestalled.

Wally Evans farewelled

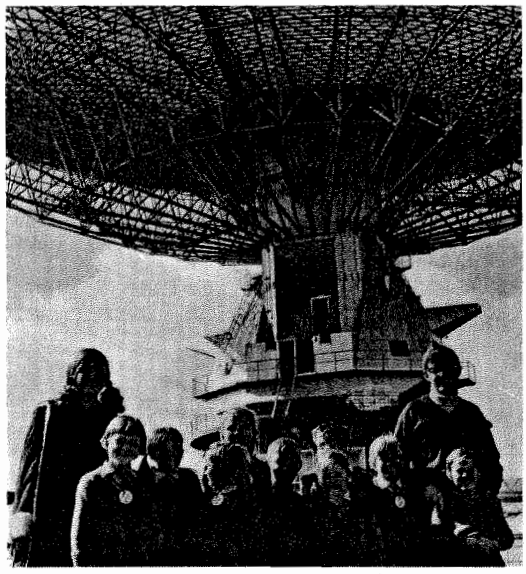
When Wally Evans left CSIRO last month, the Organization said goodbye to a personality who had been a member of the Melbourne staff for 28 years, seven of them with the Division of Building Research and 21 of them with Head Office. In that time Wally performed an unusually large range of duties including secretarial and administrative work for some of the boards on which CSIRO is represented, particularly the Electrical Research Board and the Radio Research Board.

'One piece of work for which Wally will be specially remembered is the detailed analysis and description he made of the activities of the Radio Research Board,' said the Chairman, Dr J. R. Price, when he presented Wally with a watch. 'This is a fascinating part not only of CSIRO's history, but also that of Australia.'

Dr Price made mention of Wally's public relations work for the Organization which he said had done much to make known the aims and objects of CSIRO familiar to the community.

Wally had also been responsible for building up and looking after the archival section which in 1965, Dr Price said, had been almost non-existent.

The Chairman, Dr J. R. Price (left), says goodbye to an old CSIRO personality, Mr Wally Evans. The Organization expressed its appreciation of Wally's work with the watch he is wearing.



Among the hundreds of recent visitors to the Radio Observatory at Parkes were these happy children from the Calare Public School at Orange. Although the children were all deaf, they left little doubt that the visit had been an important one in their handicapped lives. On hand to host them round the equipment was Les Fellows (right) from the Division of Radiophysics.

Overseas win for Film Unit

When Stan Evans, Officer-in-Charge of the Film Unit, and his wife, Lillian, walked into the events on the first day of the 27th Congress of the International Scientific Film Association in Bulgaria, Lillian admired a large Bulgarian crystal vase which was the trophy for the first place in the research film section.

Stan agreed that it was a fine piece but added the comment that it would be a 'damn nuisance' to carry back to Australia. A short time later the vase was in his possession and was part of his personal luggage for the rest of his overseas trip. Stan had to accept the trophy on behalf of CSIRO when the Unit's film, 'Rupture Patterns in Wood', took the first prize.

The film was produced by the Unit in collaboration with the Forest Products Laboratory with Bill McKenzie of the Laboratory as scientific adviser. The Unit's team comprised Peter Bruce (camera and editing) Perce Watson (animation) and Stan Evans (production).

Two other films were also entered: 'Measurement — an International Language', and 'Nitrogen Fixation by Legumes'.

New Unit formed

A Solar Energy Studies Unit has been formed by CSIRO. It will be headed by the Chief of the Division of Mechanical Engineering, Mr Roger Morse, who is also the immediate past President of the International Solar Energy Society.

Mr Morse will relinquish his present post early in the New Year when he and his staff will take up their new duties in Melbourne.

The Unit has been set up following a conference earlier this year when an appraisal was made of the work a number of Divisions had been doing on solar energy. Since then CSIRO has been reviewing its solar energy research in the light of Australia's future needs.

The new Unit will advise the Executive on the most promising applications of solar energy for Australian conditions and indicate the directions in which research will be most effective. It will conduct feasibility studies of solar energy and its applications, both short-term and long-term.

In making the announcement, the Minister for Science, Mr W. L. Morrison said that CSIRO had been carrying out continuous research and development of solar energy utilisation for nearly 20 years and that the work of Mr Morse and his colleagues had been largely responsible for Australia's international reputation as being in the forefront of solar energy and its practical utilisation.

Mr Morrison said the work of the new Unit would not only ensure that Australia kept abreast of solar energy developments overseas but added, 'It will help to place Australia in a position to turn increasingly to alternative forms of energy if the need arises.'

There's still hope for our oceans

Scientists will monitor pollutants

A plan to monitor pollution of the air, sea and land on a global scale is to be presented to a meeting of the Governing Council of the UN Environmental Programme when it meets in Nairobi in February.

The Chairman of the team which has prepared the submissions is Dr George Humphrey who heads CSIRO's Marine Biochemistry Unit in Sydney.

Back at his desk (briefly) after a meeting in London of the Working Group of SCOPE (the Scientific Committee on Problems of the Environment) and a conference of the General Assembly in Kiel, Dr Humphrey said that a priority list of pollutants has been drawn up for the Nairobi meeting.

These include the PCBs (polychlorinated biphenols), metals and petroleum products and it has been decided that freon should be included.

'Freon is an interesting one,' Dr Humphrey said. 'It seems to be harmless but nevertheless it is put into the atmosphere in a known quantity as the propellant vehicle used in hair sprays, deodorants, shaving creams and insecticides.

'Since it is stable and does not break down in the same way as, say, DDT does, we should be able to monitor what happens to it and use it as an indicator of interchanges between the air and sea and possibly the land. This may give us a better understanding of how some of the pollutants are dispersed.'

For years now Dr Humphrey has been concerned with pollution of the oceans but despite all the alarmist reports he is quietly confident that there is still hope for them.

'It's not so much that I'm an optimist,' he said. 'Just a realist. I believe commonsense will prevail to prevent excessive pollution. And there are signs that this is already happening.'

Dr. Humphrey said that SCOPE's working group was particularly interested in gaining a greater understanding of the way microbes break down wastes poured into the sea.

'We want to know how they break down oil, for instance, how long it takes and the effect the oil has on them. A lot of work needs to be done to find out if microbes absorb certain wastes which are then transmitted along the food chain and converted into more lethal wastes.

'We know this happens in the case of mercury which is converted into methyl mercury, but what other wastes are similarly affected by this gap in our knowledge?' he asked.

Dr Humphrey believes that Australia is a fortunate country in that it has comparatively little sea pollution.

'We're lucky to have such a vast coastline all to ourselves a long way from any other continent,' he said. This was in contrast with the four or five countries which polluted the Rhine in Europe so that it poured out a 'real mess' into the North Sea. The Baltic was also polluted by industrial waste and the Mediterranean by oil.

Dr Humphrey said that most of Australia's marine pollution was due mainly to the coastal amenities. Sewage, he added, was too valuable to be discharged into the sea.

'The main requirements are to determine baselines for acceptable pollution levels. After that, I believe the problems are more economic and political than scientific.

'Some of the reports of "dead lakes" and "dead oceans" are highly exaggerated but they do make people take notice. Scientists can give a more balanced view to the picture. It's not difficult for them to draw up a map even, of present areas of pollution on a world scale and the projected areas as well, but after that it's out of the scientists' hands and you've got to get governments to take action.'

When Ray Eaton (above), former navigator of a schooner which visits coastal missions in the north of Australia, wanted to go walkabout from Port Keats to Darwin he knew he had one problem — how to find fresh water every day.

When equipping himself for the trip he tried to find a portable still but had no luck, even though they were life-raft equipment 30 years ago. He approached CSIRO's Information Service in Melbourne for help and was referred first to the Division of Mechanical Engineering and then to the Division of Applied Chemistry.

Mechanical Engineering suggested a version of their solar still but that was ruled out because of the problems of carrying the glass.

Bob Swinton of the Water Purification Group at Applied Chemistry, a Venturer leader and bushwalker himself, came up with the answer. After a few experiments on weight reduction and simplification he produced a simple still which can prepare five to 10 litres of fresh water in a couple of hours over a wood fire.

Ray checked the still out and was full of enthusiasm when he set off last month on his trek. Walking mainly along the coast with excursions to inland Aboriginal reserves, he expects to be away a couple of months. With him is an Aboriginal guide.

In addition to the still, he is carrying a pack, small rifle, some insect-collecting gear and sample containers, maps and compass, medicine, 15 lbs of dehydrated vegetables, a hammock and mosquito net plus a two-man inflatable dinghy to bypass mangrove swamps. The mouth of the Daly River, which he has to cross, will involve a 10-mile paddle which must coincide with a 20 ft tide. His only worry is the presence of crocodiles.

Last year he went walkabout with some of the mission Aboriginals while his boat was being repaired and it was during this expedition that he discovered the fresh water problems.

Next year he plans to walk across Arnhem Land. Why? Because he reckons the Aboriginal is a 'beaut bloke' and he wants to learn more about them.

Scientist to go south with Russians

Dr John Garratt of the Division of Atmospheric Physics, Aspendale, has been invited to join a southern ocean expedition on the Russian oceanographic vessel 'Dmitri Mendalaev' this month. The vessel will call at Adelaide after an intensive programme of research in the Pacific during the last two months and will pick up a small number of Australian scientists, including Dr Garratt.

During the expedition, Dr Garratt will deploy an instrumented spar buoy at a latitude of 45-50° S. The buoy, 10 metres in length and weighing 250 kg, will house a power supply transmitter, recorders and sensor electronics.

The sensors will include an anemometer to provide mean wind speed, a thermistor for sea surface temperature, a multi-thermocouple arrangement for air/sea temperature difference and a fast response cup anemometer to provide an indirect assessment of the wind stress over the sea surface.

The transmitter will operate on an intermittent basis every half hour with a 50 W output at frequencies of about 2 and 4 Mhz and give a range of up to 500 ml at night and 100 ml by day. The buoy will be located from the ship on a day-to-day basis by the use of a suitable radio receiver.

The buoy will be a prototype of those planned for the TWERLE/RAMS experiment to be conducted in the Pacific and southern oceans during 1975. At the end of the cruise it will be recovered and brought back to Australia.

The final cost of each buoy system is expected to be about $5000.

The Minister for Science, Mr W. L. Morrison, gets a briefing on the CSIRO Repco self-twist spinning machine at Geelong. With him are from left: Mr Max Bourke, Science Liaison Officer; Mr R. B. Whan, MHR.; Dr M. Lipson, Chief of the Division, and the Chairman, Dr J. R. Price.

25 years in wool research

Twenty-five years of CSIRO wool research at Geelong was marked by an industry conference recently at the Division of Textile Industry. Among the 200 guests who attended the function were the Minister for Science, Mr W. L. Morrison, and the Chairman, Dr J. R. Price.

Opening the conference, Mr Morrison referred to the past achievements of the Organization and emphasised the value of research as a national investment. The development of the inherent qualities of wool had, through CSIRO research, made it one of the greatest fibres in the world.

Mr Morrison spoke of the natural qualities of wool such as its durability, and flame and crease resistance, which had been enhanced through work carried out by CSIRO in terms of shrink resistance, drip-dry characteristics, permanent crease and improved colour fastness. Wool, he added, could now compete not only with other natural fibres but also with the artificial ones.

It had been of some concern that there was an imbalance in the allocation of available funds between promotion and research and this he felt was to the detriment of research.

Wool Harvesting

Cont'd from page 1

Before any drug could be commercially marketed and given over to farmers to use on large scale applications, the whole technique had to be perfectly safe and cheap, Bill said.

Another aspect which is important with chemical defleecing is the possibility that having been given its injection, the sheep would begin to lose its wool in the holding paddocks. 'No farmer would appreciate that either, so we're now looking at ways of putting the animals into coats that would have a two-fold purpose — they would keep the wool intact during this period of the operation and would serve as a protection against the weather afterwards until the fibres begin to grow again. Industry is looking into this for us and we already have some coat samples.'

If chemical defleecing becomes a reality on a large scale, it will be the first major development in the shearing side of the industry in Australia since machine shearing was introduced in 1888.

Nearly 100 years have passed since then, and although there have been refinements on machinery and techniques, there have been no major changes since then in the harvesting of Australia's wool.

According to Mr Richardson, chain shearing systems offered the second best prospects, compared with chemical shearing, to save on shearing costs and skilled labour requirements. 'The Australian Wool Corporation wants to look at every possible angle of harvesting the wool and this has involved consideration of some ideas currently considered "way-out", including the use of a laser beam,' he said.

The crisis in the wool industry in 1971, had brought about a spirit of innovation which had not flagged since. However, apart from simplified wool classing through pre-sale testing, no new techniques were in commercial use.

Wool harvesting had been largely neglected and the cost of shearing, crutching and mustering averaged about 70c a sheep. The transport and handling of wool had received a lot of attention and the cost of this to the farmer could probably be reduced, he added.

CSIRO had looked at ways of improving breeding 'easy-care' sheep, the use of 'snow combs' to leave more wool on the sheep was being considered, and year-round rugging was under investigation.

Other ideas involved improvements to shearing shed complexes.

Research going on in all these areas was not confined solely to CSIRO, although the Organization was well committed to investigating many avenues of the wool industry, Mr Richardson said. Other organizations such as universities, State Departments of Agriculture and manufacturing firms, were also involved and the Corporation would be looking at all ideas put forward.

'Whether the chemical shearing succeeds or not, it does appear that in many ways the time for technological change and innovation has come to the wool harvesting scene in Australia,' Mr Richardson said. 'This change and innovation will bring benefits to individual woolgrowers and to the overall national economy, but we must see that it also brings adequate benefits to the employees who provide a major contribution to the work necessary for the success of the wool industry.

'In the overall situation of change and innovation I suggest that the keynote will have to be consultation and co-operation between employers and employees, between the woolgrowers' organisations and the unions in the wool-harvesting area, particularly the Australian Workers' Union.'

Betty Doubleday spent her last working day with CSIRO at the National Standards Laboratory library which by coincidence was where she spent her first day, 22 years ago. Photographer Harry Gillett captured this picture of Betty at an informal library function.

Librarian says goodbye — her way

The librarian in charge of the largest single collection of literature in science and technology in Australia, Ms Betty Doubleday, is to retire soon from CSIRO.

After 22 years, Betty has handed over her responsibilities to Mr Peter Dawe and has started leave which will take her through to her actual retirement date early next year.

Departure from the Melbourne office was not marked by any official functions because Betty, in typical fashion, insisted that there should be no formal farewells or presentation.

While declining to accept any personal gifts, Betty has agreed, however, to allow her association with CSIRO to be marked by a display case which is being made in her honour and which will be housed in the Central Library. It will include her OBE which she has given to the Organization in recognition of the fact, as she sees it, that 'the award most properly belongs to CSIRO and my librarian colleagues who made it possible'.

The case will contain other momentoes and documents of an historical nature and will be used to display valuable items CSIRO has in its possession.

Even though Betty has handed over the reins at the Central Library, her influence is likely to be felt around the place for a long time to come for she made a significant contribution to Australian bibliography which stands as a testament to her foresight, planning and plain hard work.

Just before her departure a review of her work was published in 'The Australian Library Journal' which said:

'Although often critical of librarians and their propensity for contemplation of their corporate navel, as also impatient of their frequent concern for minutiae (of both cataloguing and other kinds), nevertheless she herself made a substantial contribution to the profession of librarianship in Australia. She was President of the Library Association of Australia for 1962-63 and, while holding office, made a point of visiting and speaking to every Branch in the Commonwealth.

'Her advice on library and related matters has been widely sought and her services much in demand by the Australian Government — in particular for a comprehensive survey of government departmental libraries in 1959, and, again in 1965, as a member of the Working Party of the Public Service Board, the National Library, and CSIRO into a prescription and re-definition of library qualifications and salaries.

'To all these activities, Betty Doubleday has brought not only an incisive mind, a highly articulate voice, and a fierce determination for maximum achievement, but also a humanity which has so often revealed itself in a compassionate concern for the welfare of those about her.'

Betty was quick to realise the value of applying computer techniques to library procedure and information retrieval but was also aware of the pitfalls encountered overseas by librarians who had allowed enthusiasm to run ahead of economic feasibility or practicability. As a result of her disciplined approach these techniques have been applied to those areas of library management in CSIRO capable of giving maximum returns for a comparatively modest investment.

In 1972 Betty was awarded the OBE in recognition of her services to the Australian community.

Visitor

An overseas visitor to the Divisions of Mineral Chemistry and Applied Chemistry on an exchange scholarship for 12 months is Kyoji Kaeriyama from the Research Institute for Polymers and Textiles, Yokohama, Japan. Kyoji is working on cyclopentadienyl derivates of transition metals in collaboration with Drs R. S. P. Coutts, A. F. Reid, D. E. Scaife and P. C. Wailes.

Letters to the Editor

Sir—

Dr Clive Hackett was good enough to let me have a pre-publication copy of his contribution 'Finding People in CSIRO' (Coresearch 174). I should like to thank him for this and while I support in general terms his proposal that information about the scientific and technical expertise and other relevant skills of CSIRO staff should be stored in machine-readable form, it is rather difficult to put his total proposal into effect.

We have in CSIRO two data banks which go a long way towards achieving Dr Hackett's objective.

Firstly, we have a comprehensive Index to all scientific publications of CSIRO staff. A machine-readable version of this Index is being developed which includes all entries from and including 1969. Search options include authors, author location, title and keywords. In addition to published scientific papers, which are abstracted for 'CSIRO Abstracts', it also includes scripts of radio talks and other unpublished but significant material which should be readily retrievable.

In addition to 'CSIRO Index' the Information Service has built up a referral system which locates expertise in science and technology outside of CSIRO. One important reference for this work is 'Scientific and Technical Research Centres in Australia' which lists research and development interests of government, academic and industrial laboratories. This publication is being revised at present. The new edition will contain many more entries in the industrial sector. It too, will be available in machine-readable form as well as hard copy.

In the second instance, I have been advised that the Administrative Branch of Head Office has developed a computer based system which allows ready access to a record of each member of staff's biographical details, academic background and the research programme he is associated with. This system is currently being extended to include, for example, the precise scientific discipline or employment category of the individual. It is proposed to develop linked data bases to cover additional information such as overseas visit details.

However, there is no plan for the present at least to include 'extra mural activities' in this data bank (e.g. languages, non-academic qualifications, interests, skills, sports) nor have the ethics involved in incorporating into this system confidential material that may be private to the individual yet been considered. In any event, no action would be taken to include this type of data without the agreement of staff and Chiefs of Divisions.

It is clear, then, that even now we are able to provide quite an amount of information from these two data banks. This capability will increase as we develop linkages between these systems.

We would like to offer our services to members of staff who have a problem locating expertise or information in CSIRO and elsewhere in Australia. Judging by the many requests we receive from both within CSIRO and externally and from Dr Hackett's comments, we are encouraged to believe that the development of a comprehensive information storage and retrieval system should be an important objective of both the Central Information Library and Editorial Section and the Administrative Branch of Head Office.

—C. Garrow,
Manager,
Information Service.

SAFETY NOTES

What is the best type of emergency resuscitator available? A medical authority (they crop up everywhere) recently suggested that the ideal equipment should satisfy the following specification:

'It must be simple, and should be portable; inexpensive enough so that we can have it anywhere, reliable and immediately available. It should fit all patients; its rate and volume should be variable, and it should have a self-contained power source and an inexhaustible oxygen supply.'

He went on to say that the mouth-to-mouth method fulfils all these criteria.

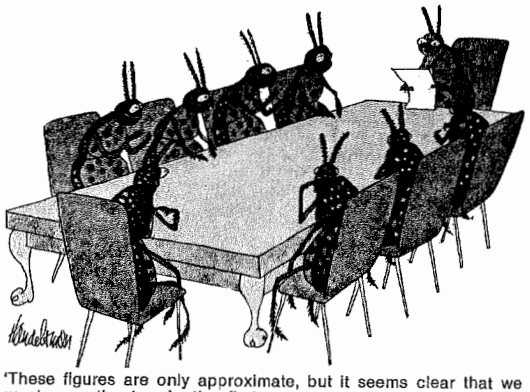
I am not so sure about inexpensive, but it could be available everywhere if we were all trained to apply it.

The film 'Pulse of Life', available on loan from the CSIRO Film Unit, graphically demonstrates mouth-to-mouth resuscitation and cardiac massage. Arrange for a showing at your laboratory, and also get an expert along to demonstrate the techniques.

Gil Barnes, Safety Officer.

New degree

Mr M. C. Rees of the Division of Tropical Agronomy has been awarded his Master of Agricultural Science Degree by the University of Queensland.



'These figures are only approximate, but it seems clear that we went over the top in the first quarter, with crop damage far beyond our expectations.'

—Courtesy 'Punch'

Obituary

Dr. D. Clark

The death has occurred of Dr Doug Clark, head of the Australian plague locust investigations at the Division of Entomology, Canberra. Dr Clark died in his sleep at Cunnamulla, in south-eastern Queensland, where he was doing field work in the campaign against the current locust plague.

Dr Clark joined the Division in 1954 and had worked extensively on plague locusts and grasshoppers. In recent years he made significant contributions to our knowledge of the breeding habits and migration patterns of the Australian plague locust, especially in relation to climatic conditions. This information is the basis of the evolution of mathematical models which predict reliably impending locust infestations. He had collaborated closely both with State authorities and with the Anti-locust Research Centre in London.

Dr Clark was respected for his professional work and his amiable temperament won him many friends. His sudden death has left colleagues both in the Division and in many other areas of CSIRO with a deep sense of loss.

At the time of Dr Clark's death considerable publicity was given to the role of CSIRO in dealing with the locust problem when the Film Unit was able to supply television channels with their film 'Tracking of Locusts by Radar'. Networks in South Australia, Victoria, New South Wales and Queensland were covered. Dr Clark had been responsible for much of the work involved.

Professor H. Marschner of the Institute of Plant Nutrition, Technical University, Berlin, is spending nine months sabbatical leave with the Division of Horticultural Research in Adelaide. His main research interest has been the mineral nutrition of plants. In Adelaide, Dr Marschner will use techniques developed by the Chief of the Division, Dr J. V. Possingham, to study the growth of chloroplasts, chlorophyll-containing particles in plant cells.

'Coresearch'

'Coresearch' is produced by the Central Communication Unit for CSIRO staff. Members are invited to contribute or send suggestions for articles. The deadline for material is normally the first day of the month preceding publication.
Material and queries should be sent to the Editor (Dorothy Braxton), Box 225, Dickson, A.C.T. 2602, Tel. 48 4478.

Printed by CSIRO, Melbourne