

C O R E S E A R C H

FOR CIRCULATION AMONG MEMBERS OF CSIRO STAFF — NUMBER 58, MELBOURNE, JANUARY 1964

SOILS CHIEF RETIRES

Mr. J. K. Taylor, Chief of the Division of Soils retired on the 5th December after 37 years of service to the Organization.

At a special afternoon tea, Dr. T. J. Marshall, Dr. C. G. Stephens and Mr. B. E. Butler expressed to Mr. Taylor the appreciation of the staff on his long and valued service to the Division and to CSIRO.

Dr. Marshall wished Mr. Taylor a long and happy retirement and presented him with an inscribed silver tray and two crystal decanters from the staff.

A farewell dinner for Mr. Taylor was held in the evening and was attended by Sir Frederick White, Members of the Executive and Secretariat, scientific colleagues, and the research staff of the Division. In paying tribute to Mr. Taylor, Sir Frederick said that his scientific achievements and leadership had made possible the growth of the Division of Soils from its small beginnings to its present status.

The following afternoon a sherry party was arranged for Mr. Taylor by the Waite Agricultural Research Institute.

Mr. Taylor graduated B.Sc.Agr. (Honours) at the University of Sydney in 1920 and became Demonstrator in Agricultural Chemistry at that University.

In 1921 he was awarded a Walter and Eliza Hall Research Fellowship for post-graduate research in soils and plant nutrition at the Universities of Sydney and California.

Dr. T. J. Marshall making the presentation to Mr. Taylor on behalf of the staff of the Division of Soils.

He obtained his M.Sc. at the University of California in 1923 and his B.A. (Honours) at the University of Sydney in 1924, and was appointed Lecturer in Agricultural and Dairy Bacteriology at Hawkesbury Agricultural College, New South Wales.

In 1927 Mr. Taylor was appointed to the Division of Soils in the Council for Scientific and Industrial Research and undertook the first soil surveys conducted by the Council.

Mr. Taylor was closely associated with his Chief, Professor J. A. Prescott, in building up the Division and expanding its soil survey activities.

He also played an important role in the establishment of regional laboratories in the various parts of Australia so that the work of the Division could be carried out more effectively.

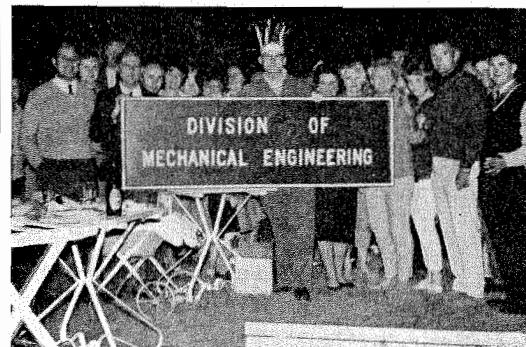
Mr. Taylor was appointed Deputy Chief of the Division in 1944 and Chief in 1947. Since then the scope of the Division's research has been greatly increased and there are now strong research groups concerned with the chemistry, physics and microbiology of soils, and with clay mineralogy, pedology and soil survey.

Mr. Taylor has been closely associated with many aspects of the development of soil science in Australia.

He played a leading role in the formation of the Australian Soil Society and was its president during 1958-60. He also played an important part in the recent establishment of the Australian Journal of Soil Science.

Mr. Taylor has no definite plans for his retirement but intends to remain in Adelaide.

Dr. T. J. Marshall will be Acting Chief of the Division of Soils until the arrival of the new Chief, Dr. E. G. Halls-worth.



NEW CHIEF INDUCTED

Section becomes Division

The Engineering Section, in the Melbourne suburb of Highett, recently became the Division of Mechanical Engineering.

Mr. R. N. Morse, former Officer in Charge is the Chief of this Division.

The Division has about 70 employees, and the change to Divisional status formalises an alteration in function that has been proceeding for many years — the swing-over from service work to research.

The activities of the Division of Mechanical Engineering are chiefly concerned with engineering thermodynamics. Re-

search groups are interested in solar energy and thermal radiation, refrigeration and air conditioning, automatic control systems, heat and mass transfer in bulk grain storages, and the kinematics of agricultural ploughs.

The Division still retains some interest in service work, a current example being the inspection of commercially-made cabinets for the Canberra phototron.

APPOINTMENTS VACANT

The following vacancies for professional appointments are current:—

EXPERIMENTAL OFFICER (E.O. 1/2)—Division of Land Research and Regional Survey, Katherine. 619/49 (15th January).

RESEARCH OFFICER (R.O. 1) (Plant Physiologist or Microbiologist)—Division of Soils, 270/274 (10th January).

EXPERIMENTAL OFFICER (E.O. 1/2) (Chemist)—Division of Animal Genetics, 675/132 (17th January).

EXPERIMENTAL OFFICER (E.O. 1/2) (Biochemist)—Division of Plant Industry, 815/53 (10th January).

RESEARCH OFFICER (R.O. 1)—Division of Coal Research, 400/428 (13th January).

EXPERIMENTAL OFFICER (E.O. 1/2)—Division of Chemical Physics, 581/26 (10th January).

Mineral Chemistry to Move

The Division of Mineral Chemistry will shortly transfer from Fishermen's Bend to a property on the corner of Williamstown Road and Salmon Street, Port Melbourne.

Purchased by CSIRO for £176,000, the buildings were formerly occupied by Balm Paints Pty. Ltd.

They consist of 154 squares of laboratory and office space, 255 squares for pilot plant or pro-

cessing work, 300 squares of storage space and an amenities building of 69 squares.

The acquisition of this property has enabled the Executive to provide much-needed accommodation for the Division of Mineral Chemistry more rapidly than would have been possible under earlier plans.

Former plans were to move the Division to Clayton, next to Monash University.

The new buildings have mezzanine floors, and, fitted with a massive system of exhaust air ducting, are ideal for large-scale chemical research and for processing plant.

Located about one mile from Station Pier, the property is against a 30-acre park reservation and in the middle of the largest collection of major manufacturing, transport and tertiary industries in Victoria.

The Division of Mineral Chemistry is made up of five sections: Electrochemistry, Mineral Treatment, Process Development, Analytical, and Inorganic.

Research projects undertaken by the Division are directly connected with the Australian mineral economy, and the Division is responsible for effective liaison with the chemical and mineral industries.



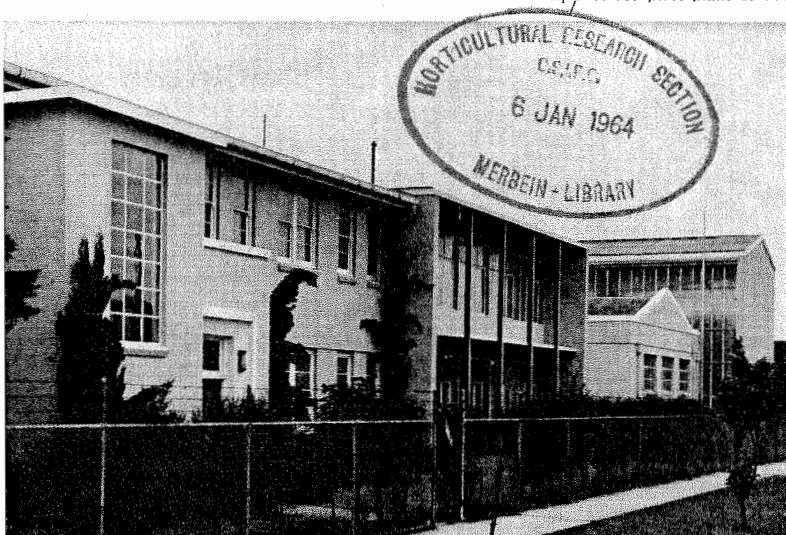
In brief

Mr. C. S. Christian, Member of the Executive, has been made a member of the World Academy of Art and Sciences. One of the Academy's objectives is "to encourage research on vital problems of mankind from a scientific and global point of view."

Dr. A. McL. Mathieson of the Division of Chemical Physics has been awarded the H. G. Smith Medal for 1963 by the Council of the Royal Australian Chemical Institute for distinguished contributions to chemistry.

Mr. R. N. Morse, Chief of the Division of Mechanical Engineering, has been elected a Director of the Solar Energy Society, Arizona, U.S.A.

Mr. G. R. Moule of the Division of Animal Physiology has been appointed Officer in Charge of the Division's Ian Clunies Ross Memorial Research Laboratory, Prospect, Sydney.



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DESERT EXPEDITION

White Men Meet Bindibus

Dr. Donald Thomson, Head of the Department of Anthropology, University of Melbourne, led his second expedition into the Bindibu country in north-eastern West Australia in September, 1963.

Sponsored by the Royal Geographical Society of London, the 3-man expedition was designed to gather more information on the lives of Australia's nomadic stone-age aborigines.

Len McClarty, a first-class mechanic, lent by the manufacturers of the expedition's trucks, had duties ranging from wheel changing to catching reptiles. I was lent by CSIRO Film Unit to record the trip on film and to act as cook and wireless operator.

The trip to Giles, our operational base, was a revelation in the straight-line distance you can travel in Australia without running into the sea!

by David Corke
CSIRO Film Unit

Certainly, the going was slow in two three-ton trucks—one of which was carrying the light Haffinger scout car.

Slowly we saw the landscape change as we moved north. First came the mulga trees, then porcupine grass, then the sand dunes as we moved closer to Giles, the meteorological station.

From a little way off the tall radio masts that rise above the desert add a touch of conquering finality to a part of Australia that has only known explorers, camels, disappointment, dust and thirst.

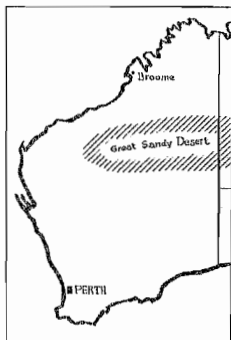
The dust is still there but the thirst is more easily quenched at Giles these days!

From Giles we set out first of all to find some natives on the fringe of the desert.

Water was one of our problems. "E" for Ethelred carried all our stores, fuel, cameras and scientific gear, as well as eighty-eight gallons of water.

This was more or less for emergency use so we had to find—some permanent water hole from which we could work.

North of Giles, in the Walter James Range, we camped near a magnificent rockpool which the natives called "Punkaberri". This rockpool was about thirty feet across, up to twelve feet deep, and filled with clear rain-water that was a vast improvement on the bore water we had been drinking all the way from Adelaide to Giles.



We also found a group of natives not far away at another rock hole. These people of the Ngadadarra tribe had been in touch with white men for many years and most of them, particularly the young men and women, wore clothes and spoke some English.

The older ones, however, still retain their knowledge of the primitive skills and crafts which we hoped to record and film before they are lost forever.

Their implements were few—spear throwers, spears and wooden vessels for carrying food and water.

We filmed these people digging up the long nearly-straight roots of a particular tree to make their spears. They straightened them by heating over a fire, scraped them down with stone scrapers, and fixed the barb to the shaft with kangaroo sinew.

Another sequence was filmed of two older women cooking and eating linga, a lizard which they seemed to favour as a food.

Perhaps the most primitive sequences we filmed were of these natives cooking and eating a red kangaroo.

After singeing off the fur, the legs were broken and then the whole animal was placed in a narrow trench filled with the glowing ashes of a fire.

With its feet sticking grotesquely into the air, the body was covered with hot ashes and left for half an hour or so.

Then it was dragged out and the legs cut off with stone knives, and huge sections of meat were passed around.

At this time the three of us on the expedition had been laid low by attacks of dysentery and we felt we needed a change from the everlasting cans of luncheon beef. We traded half a bag of flour for one of the kangaroo legs and the tail.

Roasted in the camp oven with onion and potatoes it tasted wonderful and the day went down in our diaries as a memorable one.

We were sorry to have to leave these people, but we had to push on northwards, around Lake McKay to find and film some of the true desert nomads—the Pintubi.

Bindibu hunters trussing a red kangaroo before cooking it in a primitive underground oven.



Success for a young hunter. A dragon lizard dug from its burrow in the red sand is held aloft by a little girl. As soon as they are able, the children follow their parents and share their activities.

"E" for Ethelred, our three-ton truck and Tjolpolonko, a light Austrian scout car, had raised a long cloud of red dust from the moment we swung west from "Sandy Blight Junction"—about fifty miles south-east of Lake McKay, central Australia.

We reached Mt. Webb at nightfall when the hills were vague shapes against a moonless sky.

Somewhere ahead was our objective, Jupiter Well, where we hoped we might contact some of the last of the desert nomads—the primitive Pintubi or Bindibu tribes that roam the sand dunes of the Great Sandy Desert.

As we came over the top of a dune we could see a mass of spinifex alight and figures dashing about lighting other clumps.

Before we reached them the fires had gone out, leaving glowing patches in the dark. These led us to a party of natives—two Pintubi women and three children sitting around a small fire in the open.

We sat on the sand and tried to find out where they were going and if there were any men with them.

We understood little of what they said and even found it difficult to make out which way they were going as they pointed excitedly first one way and then the other.

The spinifex they had fired to attract our attention was still smouldering as we groped around in the dark interior of the truck for the bag of flour—friendship is offered and accepted in cupfuls of flour. And for good measure we gave the children a billy full of our precious water.

It was 1.00 a.m. and we were all feeling the effect of a long day which had started at 5.00 a.m.

We rolled out our swags on the sand not far from the first of the Pintubi or Bindibu people we had seen since leaving Giles about three weeks before.

The following day when heading further west towards Jupiter Well we were surprised by four naked men rushing across the track just ahead of us as we swung through a patch of desert oaks.

Far from being timid these people laughed, shouted, and gesticulated continually.

It was impossible to understand or be understood. A few words such as "narbpa" or "karpi", meaning water, brought excited shouts of comprehension, and before long they took us over the sand dunes to the deep well dug into the sand between the dunes.

We spent several days among these friendly, cheerful people, filming their activities such as getting water from the fourteen feet deep well.

This is quite a skilled operation, and more than once they showered us with abuse as we went too near the edge and knocked a handful of sand down into the dark hollow of wet sand and water below.

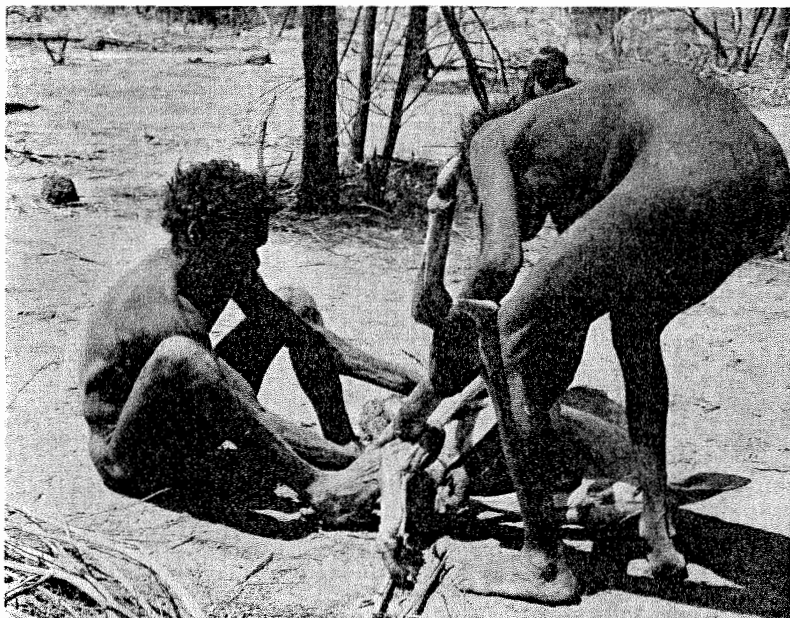
We filmed them grinding seed and throwing spears, and they in their turn, watched and noted everything we did.

The radio set was a source of wonder, but white man's magic reached its peak with the tape recorder.

The picture of utter amazement at the sound of their own voices emanating from a box will stay with me for a long, long time.

We had completed our reconnaissance of the Bindibu country and as I had to hurry back to a filming job on the radio telescope at Parkes I caught the weekly charter plane from Giles.

Dr. Thomson and Len McClarty faced the 2,000 mile return trip to Melbourne without the benefit of a relief driver. They were dogged with ill-luck and spent a gruelling eight days battling against dust and mechanical failures before reaching civilization.



Christmas Parties



Father Christmas in a number of guises was introduced to CSIRO children throughout Australia at parties commencing on Saturday, 7th December.

At the Division of Textile Industry in Geelong one hundred and sixty children voted Santa Claus a great success and their enthusiasm amply rewarded the efforts of the Social Club.

Eighty of these children were from three local orphanages — St. Augustine's, St. Catherine's and Kardinia Children's Home.

Twenty-five children from the Antonian Institute, Richmond, joined with nearly one hundred CSIRO children in celebrating at Head Office on Saturday, 7th December.

Their entertainment included a puppet show which featured "Three Billy Goats Gruff", "Wizzo the Wizzard", and "The Tar Baby".

Mr. Jack Bourne played Santa Claus, for the eleventh successive year.

Jack, who is Officer-in-Charge of the Regional Staff and Salaries Section, first played Santa Claus when he was with the Division of Forest Products.

Recounting his experiences, Jack said that one year he attempted to come down the

Head Office fire escape but got stuck on one of the landings. A gust of wind caught his cloak with embarrassing results.

Next year the Social Club added a pair of trousers to his suit.

Another year, while Jack was dressing up for his part, a child and his father walked into the room.

Pretending to be nonplussed Jack asked the child, "What would you like for Christmas?" The child replied, "You ought to know—I wrote to you."

When his own children were young Jack had to make various excuses to explain his 'disappearance'. On his return in plain clothes they would give him an enthusiastic description of the great show he had missed.

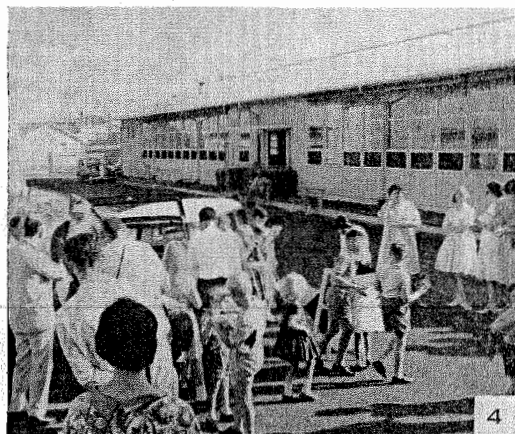
The Division of Fisheries and Oceanography held a pre-Christmas social on Saturday, 7th December, and this was attended by about eighty members of the staff and their friends.

Highlights included a crazy hat parade, and prizes for the most original creations went to Miss Anne Tierney with "All I Want for Christmas is my Two Front Teeth" and to Mr. Andy Herron with "Underneath the Arches".

Pamela Rosevear and Lynne Wilson organised the Coal Research cabaret held on the evening of Tuesday, 3rd December.

"Cheerful Charlie" Jim Brooks was the comper.

Pamela and Lynne have now organized the last two annual balls and the last two Christmas cabarets.



(1) At the Division of Forest Products children's party Father Christmas (Jack Crisp) with Mrs. H. Sadoh and son, Michelle Lee and Michael Addo Ashong.

(2) & (4) Father Christmas distributes largesse at the Head Office party and at Meteorological Physics.

(3) Father Christmas (Peter Hume) makes friends with Satoru and Yasuko, the children of Dr. Masaru Goto, at the Division of Building Research.

(5) Dick Heighway's son gives Father Christmas his order at the Textile Industry party.

Birdbook popular

"Waterfowl in New South Wales", a handbook published by the Division of Wildlife Research and the N.S.W. Fauna Protection Panel, has proved popular with shooters and conservationists.

CSIRO's Canberra library, responsible for distributing 3,000 copies of this free book, have been receiving up to one hundred requests a day.

The Fauna Panel has been given 7,000 copies for distribution.

The book summarizes some of the results of recent research on waterfowl carried out in New South Wales in the last ten years and suggests where the most effective conservation measures should be applied.

It also carries a number of pages of illustrations, and indicates simple identification marks from which sportsmen and naturalists can recognize the different species from fleeting glimpses.

Holiday Club

Anglesea Holiday Club, which provides its members with attractive accommodation on the Victorian sea coast, has three shares for sale, each valued at £100.

All employees of CSIRO are eligible members, but applicants must be proposed and seconded by Club members.

Members can book holiday flats (self-contained, mod. cons.) at Anglesea for £2 per week.

Further information can be obtained from Dr. R. G. Vines, Division of Physical Chemistry, Chemical Research Laboratories, Fisherman's Bend, Victoria.

THIS MONTH'S OVERSEAS TRAVELLERS

Dr. R. G. Chittleborough of the Division of Fisheries and Oceanography returned recently from the United States where he attended the Sperm Whale Conference of the International Whaling Commission at Seattle last November. The main objectives of the meeting were to co-ordinate biological research on sperm whales, to attempt a preliminary assessment of the condition of sperm whale stocks, to organize procedures for collection of statistics and to recommend appropriate

measures to promote sustainable and optimum results.

Dr. D. F. Martyn, Officer in Charge of the Upper Atmosphere Section, travelled to Europe recently to attend the General Assembly of the International Council of Scientific Unions held at Vienna. The primary functions of ICSU are to co-ordinate and facilitate the activities of the International Scientific Unions in the field of natural sciences and to act as a centre for the national organizations adhering

to the Council. Dr. Martyn was nominated a member of the Executive Board of ICSU by the Australian Academy of Science.

Dr. D. S. Taylor of the Division of Textile Industry will leave Australia on the 4th January to travel to U.S.A. He will have discussions with the staff of Warner and Swasey Company, Cleveland, Ohio, concerning the development of the silver converter used in wool processing. He will also visit the Wool Bureau Incorporated, New York, for discussions on non-woven textiles.

Visitors from Overseas

Dr. A. T. Johns, Director of the Plant Chemistry Division, D.S.I.R., New Zealand, visited Australia recently to survey the cattle bloat problem in this country. Dr. Johns has pioneered a method of spraying pastures with anti-bloat agents and while in Australia he discussed the physics of foams with several CSIRO scientists. His visit was financed by the Australian Cattle and Beef Research Committee.

Dr. S. M. Naudé, President of the South African Council for Scientific and Industrial Research, will arrive in Australia this month to participate in ANZAAS meetings and inspect CSIRO Wool Research Laboratories. He will also visit the Divisions of Radiophysics, Animal Genetics, Animal Physiology and Plant Industry and the National Standards Laboratory.

Dr. S. J. du Plessis, General Director of Research in the Department of Agriculture, South Africa, will arrive in Australia this month to examine the wool research programme developed in this country. Dr. du Plessis is specially interested in the problems of wool production. He will visit the Divisions of Animal Health, Animal Genetics, Animal Physiology, Tropical Pastures, Plant Industry, Entomology, and Wildlife Research.

Dr. E. C. Potter of the British Central Electricity Generating Board recently visited Australia to discuss corrosion problems with Australian scientists. Dr. Potter's work is concerned with the study of corrosion at the Board's Central Research Laboratories at Leatherhead, Surrey. He is also closely associated with corrosion studies at the University of London.

Professor E. M. Purcell of Harvard University arrived in Australia in December for a one month visit before returning home from Japan. He will spend three weeks with the Division of Radiophysics.

Mr. F. L. Ward of the New Zealand Meat and Wool Board's Economic Service will visit Australia this month to deliver a paper at ANZAAS. He will spend the following two or three weeks meeting CSIRO officers carrying out sheep industry research. Mr. Ward has specialised in the study of the fine wool production in the South Island of New Zealand.

Dr. J. G. van der Wath, Chairman of the South African Wool Board, will arrive in Australia this month and will visit the Divisions of Tropical Pastures and Animal Health while en route to New Zealand. He is interested in Australian research work on fodder plants in the summer rainfall area.

APPOINTMENTS TO STAFF

Dr. T. J. Batterham has been appointed to the Division of Organic Chemistry, Melbourne, to take part in chemical studies of biologically active metabolites from plants and micro-organisms. He graduated B.Sc. (Hons.) from the University of New South Wales in 1957 and Ph.D. from the same University



Dr. T. J. BATTERHAM

in 1961. Dr. Batterham was formerly at the Laboratory of Physical Biology, National Institute of Arthritis and Metabolic Diseases, Maryland, U.S.A., working on the isolation and chemical structure of mould pigments. From 1957-62 he was a lecturer at the Newcastle Technical College, New South Wales.

Mrs. Coryl I. Muntz has been appointed to the Division of Land Research and Regional Survey, Canberra, where she will assist the Division's editor in the preparation of reports. Mrs. Muntz graduated B.Sc. from the University of Melbourne in 1949 and until 1956 was on the staff of the National Herbarium of Victoria engaged in systematic botany.

Mr. T. R. E. Davey has been appointed Section Leader in



Mr. T. R. E. DAVEY

the Division of Chemical Engineering, Melbourne. His Section is engaged in the development of chemical processes to the technical or pilot plant

scale. At the University of Melbourne Mr. Davey graduated B.Sc. in 1947, B.Met.E. (Hons.) in 1948, and M.Met.E. in 1954. He was formerly a Consultant to the Imperial Smelting Corporation, Avonmouth, U.K., and spent a number of years with Broken Hill Associated Smelters, Port Pirie. Mr. Davey holds a 1955 Gold Medal Award from the American Institute of Mining and Metallurgical Engineers.

Dr. R. W. Clark has joined the Division of Radiophysics where he will carry out research in solar, cosmic and hydrogen-line radio astronomy. From the University of Cambridge Dr. Clarke graduated B.A. (Hons.) in 1959 and Ph.D. in 1963. He was previously a research student at Cambridge and has been responsible for bringing into operation a new pencil-beam "synthesis" instrument on 178 megacycles per second.

Mr. R. A. F. Foulds has joined the Division of Textile Physics where he will assist in a study of stability and mechanical properties of cloth knitted in different ways. Mr. Foulds graduated B.Sc. (Textile Industries) from the University of Leeds in 1962. He was formerly employed by the Fraser Knitwear Company, Glasgow, and the Fibre Division of I.C.I., Harrogate.

Mr. J. Lax has been appointed to the Division of Animal Genetics Sydney where he will assist in experiments on selection of sheep for meat production, the assessment of proportions of bone, muscle and fat in sheep carcasses and the determination of the efficiency by which food is converted to meat. Mr. Lax graduated B.Ag.Sc. from the University of Queensland in 1961 and was formerly employed by the Swift Australia Company, Maryborough, supervising a poultry breeding programme.

Mr. K. L. Piggott has joined the Division of Chemical Engineering, Melbourne, where he will assist in work on plant and equipment design, and on the evaluation and costing of new processes. Mr. Piggott obtained his B.Sc. from the University of Birmingham in 1953 and was formerly employed by the Power Gas Corporation Limited.

Dr. A. J. Pratt has been appointed to the Division of Textile Industry where he will conduct chemical studies on the modification of wool fibres with a view to developing new fabric finishes. At the University of Manchester Dr. Pratt graduated B.Sc.(Hons.) in 1960, M.Sc. 1961, and Ph.D. 1963. His recent research work has been concerned with the chemistry of various metal alkoxides which are used as catalysts in the polymerization of epoxides.

Dr. P. J. Randall has joined the Division of Plant Industry, Canberra, to study the physiological effects of nutrition deficiencies in plants. He graduated B.Sc.(Hons.) from the University of Wales in 1960 and Ph.D. from the same University in 1963. Dr. Randall has been working at the Welsh Plant Breeding Station since 1960 on the genetics and physiology of aluminium and manganese toxicity in perennial ryegrass.

Mr. D. G. Thomas has joined the Division of Plant Industry, Canberra, where he will assist the Chief in research liaison activities. Mr. Thomas graduated B.Sc.(Hons.) (1945) and M.Sc. (1957). Mr. Thomas was formerly a Senior Research Officer with the Department of Agriculture, Uganda.

Mr. R. Purchase has been appointed Divisional Administrative Officer at the Irrigation Research Laboratory, Griffith. Mr. Purchase is an honorary M.A. of Christ's College, Cambridge. From 1949-57 he was laboratory manager of the Research School of Physical



Mr. R. PURCHASE

Sciences, A.N.U. He resigned from this position to become laboratory superintendent of the University of Cambridge's Department of Chemistry. During the war he did a tour of operations with Bomber Command.

Mr. R. Q. B. Tarrant has been appointed to the Division of Applied Physics to assist in the application and refinement of modern developments in physics to achieve better standards of physical measurement. Mr. Tarrant graduated B.Sc. (Hons.) from the University of Canterbury in 1962. He was formerly employed by Amalgamated Wireless Valve Company, Sydney, and for a short time in 1963 was relieving science and mathematics master at Samoa College, Apia, West Samoa.

Dr. R. E. Willette has been appointed to the Division of Organic Chemistry, Melbourne, to participate in chemical studies of biologically active metabolites from plants and micro-organisms. Dr. Willette, an American citizen, graduated



Dr. R. E. WILLETTE

B.Sc. (Pharmacy) from the Ferris State College, Michigan, in 1955, and Ph.D. from the University of Minnesota in 1960. Since 1961 he has been an Honorary Research Fellow of the Australian National University where he held a U.S. National Institute of Mental Health Fellowship.

Printed by CSIRO, Melbourne

TECHNICAL ASSOCIATION NEWS

Council in Person Meeting

This meeting occupied all day Saturday and Sunday the 7th and 8th December and concluded with the final item on a very long agenda which covered subjects ranging from juniors' salaries and certificate courses to compensation and adult salary rises.

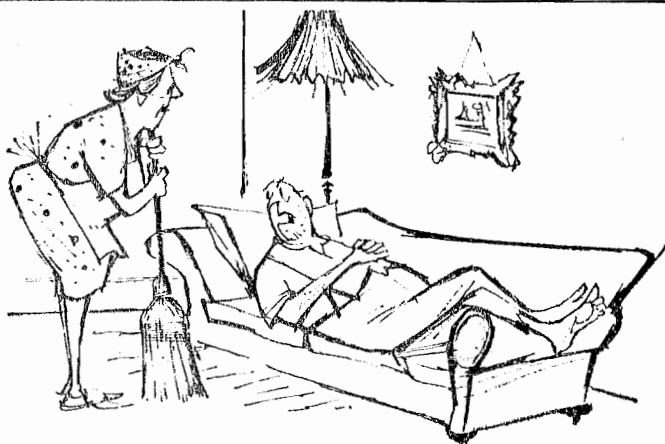
The twelve delegates spent sixteen hours discussing the items brought to the meeting and arranging the agenda for discussions with the Secretariat on Monday, 9th December.

It would be as well to point out to members that the Branch Committees and Divisional delegates should be familiar with the details as per the minutes on or before the usual branch meeting in January. Members are urged to acquaint themselves with the results by attending any lunch-hour meetings called.

Once again Council would like to place on record its appreciation of the facilities made available for the meeting days and for the informal manner in which the meeting with Messrs. Gillespie, Coombe and McLennan was conducted. Council also appreciated the attendance of Dr. Bastow who has always shown a marked interest in the technical staff.

At the latter meeting a comprehensive list of items was presented for discussion. One of the main issues was implementation of an expected rise in the Public Service Technical Grades. This has yet to be decided by the Arbitrator and due to the present legal recess the Association does not expect a decision until early February.

The subject of official training of the technical staff was another important item. The Secretariat agreed to follow this item up with a view to relieving the present situation in the training of technicians.



"Creative thinking is not loafing, woman."

By courtesy, The Bulletin

CORESEARCH

FOR CIRCULATION AMONG MEMBERS OF CSIRO STAFF — NUMBER 59, MELBOURNE, FEBRUARY 1964

DEATH OF DR. BASTOW

Dr. S. H. Bastow, D.S.O., B.Sc., Ph.D.(Cantab.), F.Inst.P., F.R.A.C.I., a Member of the Executive of CSIRO, died suddenly in Melbourne on Thursday evening, 23rd January, at the age of fifty-five.

Dr. Bastow was born at Folkestone, England, on 22nd February, 1908, and was educated at Caulfield Grammar, Melbourne; Hutchins School, Hobart; and the Church of England Grammar School, Brisbane. After graduating in Science (Physics and Chemistry) from the University of Tasmania in 1926, he became a Demonstrator in Physics at the University.

In 1928 he worked with Professor A. L. McAulay on a research programme for C.S.I.R. on the electrical behaviour of surfaces of corroding iron.

He spent from 1929 to 1934 at Kings College, Cambridge, where he obtained his Ph.D.

He worked firstly with Professor E. K. Rideal on catalysis at low temperatures and in high vacua, and then with Dr. F. P. Bowden on the physical properties of surfaces.

In 1932 he was awarded the Senior 1851 Exhibition for Physical Chemistry.

From 1934 to 1937 he worked with National Enamels Limited

and the South Metropolitan Gas Company, England, where he initiated a programme of fundamental research into the bonding of glass and iron and the chemical and physical processes involved.

He spent the next three years as Senior Chemist with the Anglo-Iranian Oil Company and commenced a programme of investigations to overcome the technical problems connected with drilling fluid encountered in deep drilling for oil under high pressure.

In 1940 he was commissioned in the Royal Engineers, where he became an instructor in special tunnelling and demolitions at the School of Military Engineering.

He subsequently rose to the rank of Major and was made responsible for the technical efficiency and layout of anti-aircraft smoke screens in a number of parts of the United Kingdom, and for the technical training of smoke companies.

He took part in the Allied invasion of Europe and was awarded the D.S.O.

Dr. Bastow joined CSIRO in 1945 as Officer-in-Charge of the

Lubrications and Bearings Section (now the Division of Tribophysics) and in 1949 he was made a Member of the Executive.

Dr. Bastow will be missed by a great many people in a great many walks of life.

He had a remarkably wide interest in the problems of Australian industry as a whole and was keenly concerned that the results of scientific research should be made known to industry and applied to the benefit of the community.

His years spent with the Anglo-Iranian Oil Company made him acutely aware of the difficulties which had to be surmounted before research findings could be put into practice.

He made a considerable contribution to the development of science and industry in Australia and played a leading part in the affairs of the Royal Australian Chemical Institute, of which he was Vice-President in 1962-63.

He was a man of great modesty and great charm, with a tremendous interest in, and understanding of, other people. Although shy of any personal publicity, he was always ready to give up his time to address meetings, however small, on the role of science in the community.

Completely lacking in pretentiousness himself, he disliked it in others and could quickly deflate the most pompous with wit and charm.

He had a deep interest in the welfare of young people and this led him into many activities concerned with their education, both in the schools and in the universities. He was a member of the Council of Monash University.

Dr. Bastow was also a fine sportsman. He rowed with the University crew in Tasmania, and was devoted to Royal tennis, being champion of Australia in 1929 and captain of the Cambridge University team.

At the time of his death he was President of the Royal Melbourne Tennis Club.

Dr. Bastow will be particularly missed by his colleagues on the Executive and by the staff of CSIRO.

He was always a willing listener and was a frequent and



Dr. S. H. BASTOW

popular visitor to the Organization's laboratories and field stations all over Australia.

In a tribute to Dr. Bastow, Lord Casey said: "Stewart Bastow was an extraordinarily interesting, capable and modest man, with an encyclopaedic range of interests."

"His three line entry in Who's Who gives a misleadingly short account of his vigorous and varied life. I frequently

talked privately to him and there were few subjects on which he did not have enlightening and original views, which were often refreshingly controversial."

"He was a living example of the motto of the Royal Society which can be freely translated 'We take nothing for granted'. CSIRO and Australia will be the poorer for his untimely death."

Solar Still for W.A.

The Division of Mechanical Engineering has installed a solar still in the grounds of Muresk Agricultural College, eight miles from Northam, Western Australia, as part of an investigation of the prospects for solar stills in Western Australia.

The Public Works Department of Western Australia is co-operating with the Division on the project.

Western Australia has large areas carrying salt water unfit for use by livestock or humans.

The still has an area of 4,500 square feet, uses brackish water pumped from the Avon River, and has an estimated output of 350 gallons per day. The complete assembly consists of ten units each 128 feet long by 3 feet 6 inches wide. The units run north and south and are built at ground level on a site graded 1 in 100 lengthwise and 1 in 70 laterally.

The ground was treated with weedicide, and with insecticide to protect the polythene from termite attack.

The four-man construction team, under the supervision of Mr. W. R. Read of the Division of Mechanical Engineering, completed the installation in two weeks.

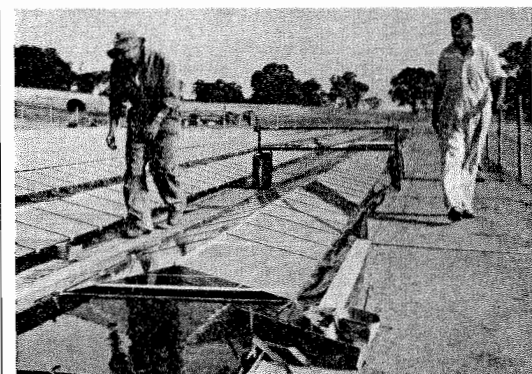
They were plagued by sand, flies, wind and excessive heat. To add to their discomfort a willy-willy passed over the uncompleted still and flattened about 90 feet of it. The next day the site was lashed by a storm but damage from hail stones up to three-quarters of an inch in diameter was limited to one broken pane of glass.

Supply water, which has a seasonal variation in salinity from 1,400 to 13,000 parts per million, is pumped from the Avon River to a 3,000 gallon storage tank. Approximately 750 gallons of river water are used daily and the excess is discharged back into the river.

The distillate gravitates down collecting troughs to a storage tank; this is connected to a stock drinking trough in which a float valve regulates the water level.

An interesting point concerning a still of this design is that distillation is a continuous process. From 30 to 50 per cent of the total distillation takes place between sunset and sunrise.

Solar still at Northam, Western Australia, near completion. A sheet metal framework covered with black polythene has troughs on each side to collect distilled water formed on the underside of the glass roof. Modification of this design should enable stills to be erected in remote areas by unskilled labour.



U.S. RESEARCH GRANTS

The Foreign Research and Technical Programs Division of the U.S. Department of Agriculture has made two grants to the Division of Food Preservation under the Agricultural Trade Development Assistance Act, 1954.

The larger grant, \$46,000 over 5 years, will help finance an investigation into the cyclopropanoid compounds found in cottonseed and cottonseed products.

The presence of these compounds in rations fed to hens causes abnormalities in the eggs laid, namely a pasty consistency in the yolks, and the development of pink whites during storage.

The compounds also reduce the hatchability of fertile eggs, and, when ingested in large amounts, cause hens to cease laying.

The investigations, which will complement work being carried out in U.S.A., will deal with the chemistry of the cyclopropanoid compounds, and their biological effects.

The results will be of considerable interest to poultrymen in Australia where cyclopropanoid compounds are ingested by hens feeding on plants of the order Malvaceae, to which the common mallow weeds belong, and because cottonseed could become an important poultry food in Australia.

The smaller grant, \$8,200 over three years, is for a study of the differences in the chemical structure of albumin, the principal protein of egg white, and S-ovalbumin, a more stable form (discovered by research

workers in the Division of Food Preservation) which it changes to spontaneously during storage of eggs.

Salbumin is indistinguishable from normal albumin except for its resistance to denaturation by heat or chemical agents.

Its formation probably accounts for the decline in the functional properties (especially the baking and whipping qualities) of egg whites.

The Charles F. Kettering Foundation, Ohio, U.S.A., has made a grant of \$8,200 to the Plant Physiology Unit operated jointly by Sydney University and the Division of Food Preservation.

The money is to be used for the purchase of equipment for research being conducted on photosynthesis by Dr. R. M. Smillie who is the leader of the Unit.

HONOUR

Dr. R. J. Meakins, of the Division of Applied Physics, National Standards Laboratory, has been awarded the degree of D.Sc. by the University of London. His thesis was entitled "The relationship between structure and dielectric properties of materials".

Arbuthnot's (SCOR)

RICE GROWING IN THAILAND

The Government of Thailand has devoted its attention in recent years to major dam building projects to control the flooding of rivers during the summer wet season and to provide irrigation water during the dry season.

As irrigation water had never been supplied to individual farms from a public scheme before, the Thais asked Australia to help on the technical aspects of the scheme.

Rice is the staple diet of the 24 million people of Thailand. Outside Bangkok it forms the basic item of diet and the traveller must be prepared to eat about one pound of rice daily; it never palls, because of its excellence.

Present production is about seven million tons of paddy, and over one million tons of polished rice is exported to other countries of South East Asia and to the Middle East.

The main producing area, the Central Plain, is recognized as the rice bowl of Asia.

The Central Plain is the flood plain of the Chao Phya River, Delta-shaped, it is 125 miles long and about 60 miles wide with the town of Chainat at its narrow northern point. Bangkok is at the wide end, near the Gulf of Siam.

The plain reminds one of Australia's Riverina district in some ways. It is very flat and the three major rivers are effluent channels or anabranches of the Chao Phya River, just as the Edwards River is an anabranch of the Murray.

In the same way, the rivers are higher than the surrounding plain because of their natural levees, and a strip of light soils near the river slopes off from the heavier soils of the plain.

During the dry season the rivers barely flow but start to rise in June at the beginning of the wet season.

The heavy rains in August to September cause a very high peak flow in September and October, by which time the whole plain is under water that

varies in depth from less than one foot to twelve feet.

Only the high levees and canal banks are above water. Houses are built on stilts and nearly all transport and traffic in the plain during the wet season is by boat.

The method of growing rice varies, depending on when the flood reaches the land and the depth of flooding expected.

As rice has been the main crop for nearly 700 years a lot of experience is available.

By L. F. Myers

Mr. L. F. Myers, Officer-in-Charge, Riverina Laboratory, Deniliquin, and Mr. J. W. Holmes, Division of Soils, Adelaide, recently visited Thailand at the request of the Australian Government to provide technical information on an irrigation scheme designed to provide water during the dry seasons.

Control of the flood waters has been improved by engineering works of increasing efficiency over the last one hundred or more years so that farmers know pretty well what to expect.

The lowest areas, where the water will be deepest and which the flood reaches first, are direct-sown with special varieties of deep-water rice. The seed is sown deep and these varieties are capable of quick growth when the flood rise is rapid.

Not uncommonly, these varieties grow in 12 feet of water. The rice is harvested by boat, if possible, and the tangle of straw left when the flood recedes can be imagined.

Over most of the plain the flood season is shorter, and the rice is transplanted from seedling nursery beds into the puddled rice fields. The method

is very laborious but the yield is 50 to 100 per cent higher (about 15 to 18 cwt. per acre).

The reason for transplanting is very clear when the areas are seen at first hand.

Rice needs 150 to 180 days to germinate and ripen. Typically, flood water is not available at the start of this period so that the first lot of water is used to raise seedlings, and while these are growing the field is cultivated, weeded and puddled.

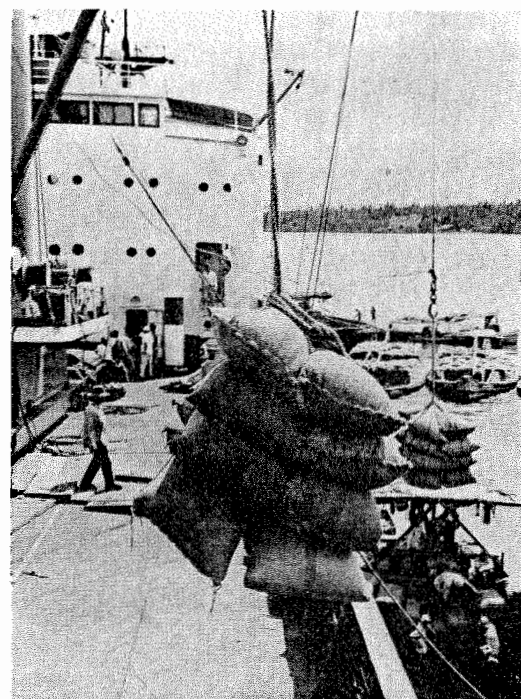
When the water is available to flood the whole farm to a depth of about 6 inches the rice is transplanted.

This may be as late as August, and harvesting begins in November.

The transplanting method thus makes the best of the short time the flood is available.

The rice is all of the indica type whereas Australian varieties are of the japonica type.

The indica varieties are low yielding but of very high quality.



Thai rice enjoys world-wide export, traditional markets ranging from Denmark to New Guinea. Among its preferred characteristics are a hard kernel, implying freedom from coagulation, and a pleasant aroma which persists after cooking.



The Thai people are very discriminating about their rice and it may well be that if rice consumption increases, they will be forced to use indica-japonica hybrids which will provide a compromise between quality and yield.

This would require a change in attitude to fertilizers, because potentially high-yielding

varieties require higher soil fertility than the indica varieties.

At present only one crop is possible, and the dry season is severely hot and dry.

The dams built on the upper reaches of the tributaries of the Chao Phya River have improved the control of water and will allow irrigation water to be delivered to farms during the dry season.

This is a radical change for an area that has worked out its agricultural methods over many centuries, but it should mean that two crops can be grown each year.

Fortunately, some experience in growing soybeans, mung beans, maize, peanuts and vegetables between the annual rice crop is available from the northern areas, and Thai farmers often display ingenuity and adaptability in impressive quantities.

To enable the farmer to grow an extra crop a number of

Transplanting rice in a variety trial, Rangsit Central Plain, Thailand.

things will need to be provided.

The delivery of water on a satisfactory rotation is the first requirement. The control of seepage and water tables will need to be carefully watched in some areas. The supply of seeds of crops of short growing season are absolutely essential. Methods for maintaining the fertility of the soil will also need to be watched, or rice yields will be reduced.

The list is not complete, but these are problems seen during our visit in both restricted and extensive areas.

The second-crop programme for the rice growing areas of Thailand offers great scope for the agricultural research worker and is an obvious way of increasing returns, and helping to ensure that the productivity of the land is maintained for the needs of future generations.



Non Synthetic

Miss Rosalind Collins, Miss Hunter Valley 1963, modelling a red all-wool street frock fashioned from an Australian Wool Bureau gold medal award-winning fabric, "Bel Merino".

The new fabric is light-weight, washable, drip-dry, sironized and is described as "allergy free". The latter property means that all traces of bisulphite used in processing have been removed.

"Bel Merino" fabric provides a good example of the way in which CSIRO research is being applied to meet the threat from synthetics.

The fabric was only recently released to the Australian market but has been exported for two seasons to Hong Kong, Tokyo, and America, and for one season to France and England.

A similar fabric, "Australaine" has all the properties possessed by "Bel Merino" but is considerably lighter. One of its uses is in making up jockeys' colours.

APPOINTMENTS VACANT

The following vacancies for professional appointments are current:

- EXPERIMENTAL OFFICER (E.O. 1/2) — Division of Building Research, Hightett. 390/119 (21st February).
- EXPERIMENTAL OFFICER (E.O. 1/2) — Division of Fisheries and Oceanography (Biologist) 320/283 (21st February).
- EXPERIMENTAL OFFICER (E.O. 1/2) — Division of Applied Physics (Physicist or Engineer) 750/287 (28th February).
- EXPERIMENTAL OFFICER (E.O. 1/2) — Division of Organic Chemistry (Organic Chemist) 606/45 (28th February).
- RESEARCH OFFICER (R.O. — S.R.O.) — Division of Animal Health, Sydney. 202/230 (6th March).
- RESEARCH OFFICER (R.O. — S.R.O.) — Division of Tropical Pastures, Townsville. 853/16 (6th March).
- RESEARCH OFFICER (R.O.) — Division of Mechanical Engineering, Hightett. 430/202 (6th March).
- EXPERIMENTAL OFFICER (E.O. 1/2) — Division of Mechanical Engineering, Hightett. 430/206 (6th March).

LATE CHRISTMAS PICTURES



Top: Acceptable fuel at Coal Research. Mr. H. R. Browne, Chief of the Division, cuts briquette-size pieces of coke at the staff party on 24th December.

Centre left: Girl house painter? Margaret Kerr accepts a gift of paint stripper from Father Christmas Kevin Harper at the Division of Food Preservation party.

Centre right: Father Christmas distributes gifts at the Division of Fisheries and Oceanography, Cronulla.

Bottom left: Butchery at Forest Products. TV idol "Dr. Killtree" makes his first (and possibly last) on-camera mistake. Pat Taylor, Roger Thompson, Claudia Appleton and Ken Montgomery are chastened by the demise of their patient.

Bottom right: Prima ballerina Andre Englesman and male lead Bob Ganly receive their ovation from an enthusiastic audience at the Division of Textile Industry, Geelong.

Dr. J. D. Colwell of the Division of Soils, Canberra, has accepted a temporary appointment at the Ontario Agricultural College, Guelph, Canada. Dr. Colwell will also visit U.S.A. and Europe and will attend the International Soil Science Congress, Bucharest.

Mr. C. Garrow of the Division of Protein Chemistry left Australia in January for secondment to the International Wool Secretariat, London. Mr. Garrow will be absent for 18 months, and will assist in the establishment of a New Uses for Wool Section within the Secretariat's Product Development Division. He will also assess the reactions of the overseas wool textile industry to vacuum pressed wool.

Mr. D. E. Henshaw of the Division of Textile Industry left Australia in December to visit the U.K., Europe and North America. Mr. Henshaw

will work at the Hosiery and Allied Trades Research Association, Nottingham, on problems concerned with yarn lubrication in machine knitting.

Dr. G. N. Lance, Officer in Charge of the Computing Research Section, is visiting U.S.A. and the U.K. to gain first-hand knowledge of computing establishments and to interview prospective staff.

Dr. D. O. Norris of the Division of Tropical Pastures has accepted an invitation to spend fourteen months at the Brazilian National Agronomic Institute, Sao Paulo. Dr. Norris will study agricultural research in Brazil and will collect Rhizobium and seed from indigenous legumes. He will also assist Brazilians in the development of a new programme of Rhizobium strain collection and utilization. Dr. Norris left Australia in January.

Overseas Visits

Visitors from Overseas

Dr. Sin-Kyo Hyun of the Institute of Forest Genetics, Korea, attended ANZAAS and visited Head Office in January to learn something of the administrative set-up of CSIRO. Dr. Sin-Kyo Hyun is responsible for planning and supervising the agricultural research and extension programme in Korea.

Professor R. E. Pierson, Associate Professor, Department of Veterinary Clinics and Surgery, Colorado State University, is spending his sabbatical leave in Australia and New Zealand to study sheep diseases. Professor Pierson will visit the Division of Animal Health, Melbourne and Sydney, the Pastoral Research Laboratory, Armidale, and the Division of Biochemistry and General Nutrition, Adelaide.

Professor C. Robinow of the Department of Bacteriology, University of Western Ontario, is spending six months in Australia and has been invited to visit the Division of Food

Preservation to discuss its work on the structure and composition of bacterial spores.

Dr. J. Rogers of the Geological Survey, DSIR, New Zealand, arrived in Australia in January to attend ANZAAS and to visit the Divisions of Chemical Engineering and Coal Research and the Ore Dressing Laboratory. Dr. Rogers is particularly interested in high pressure and other geochemical studies.

Mr. W. M. Woodhouse, Head of the Tropical Division, Building Research Station, U.K., will visit Australia in February to make personal contact with Australian representatives who attended the recent Commonwealth Architects' Conference, London. He will spend a week in February at the Division of Building Research, Melbourne.

Korean Trainee

Mr. Ryung Huh, a graduate in chemical engineering from the Seoul National University, Korea, who reached Australia in September, 1963, to study food technology under the Korean Training Scheme, will have spent about twelve weeks at the Division of Food Preservation, North Ryde, and at the Tasmanian Regional Laboratory, when he leaves Australia in April.

Mr. Ryung is a Planning Officer in the Sam Yang Company, Seoul. The company processes foods of marine, plant and animal origin.

In Australia he has visited many food production plants and has studied the refining of sugar and salt.

IN BRIEF

Dr. C. H. B. Priestley, Chief of the Division of Meteorological Physics, has been made a member of the newly formed Advisory Committee of the World Meteorological Organization.

The Committee will concern itself with major research problems in the atmospheric sciences, especially in connection with the application of meteorological satellites.

Dr. Priestley attended the first meeting of the Advisory Committee at Geneva in January.

* * *

Dr. C. Wouters of Cremorne, N.S.W., will be awarded the Dutch Visser Neerlandia Prize this month for his efforts in the propagation of Dutch culture, Dutch language and literature in Australia.

The presentation of the Prize will be made in the Hague.

Dr. Wouters retired in 1961 after 12 years service with Head Office in Melbourne and later at the National Standards CSIRO as a translator, first at Laboratory, Sydney.

Obituary

Eric James Atkins of the Division of Textile Industry died on the morning of 11th December, 1963, at the age of 42 years.

Jim joined the Division in March, 1961, as a Toolmaker and later became a Senior Laboratory Craftsman.

His likeable personality made him the friend of all and his efforts towards the annual children's Christmas party, at which he played Father Christmas, will be greatly missed.

TECHNICAL ASSOCIATION NEWS

At the time of writing no decision has been reached in the Public Service Technical Grades case. Members may rest assured that Council will do its utmost to have a favourable decision applied to CSIRO technical staff.

Junior Salaries

In the meantime, the Public Service Board has made a determination which raises the salaries of all juniors. This will be most welcome because of the previous absence of any marginal adjustment in the junior scale.

The proposed rise is a result of a regular Public Service Board survey and is not directly associated with margins rises.

General

For some time enquiries have directed to the Association from various members of the workshop staff concerning the possibility of their membership of this Association.

The Industrial Registrar has, however, always advised against the inclusion of laboratory craftsmen.

The Federal President of our Association, Mr. Eric Murray, had held discussions in Melbourne recently with various delegates of Public Service Associations, including the General Secretary of the Public Service Artisans' Association.

The latter assured Mr. Murray that the Public Service Artisans' Association now had complete coverage of laboratory craftsmen and would welcome enquiries from workshop staff of CSIRO.

APPOINTMENTS TO STAFF

Dr. M. S. Buttrose has been appointed to the Horticultural Research Section, Adelaide, where he will investigate the environmental control of flowering in perennial plants. Dr. Buttrose graduated B.Ag.Sc. (Hons.) from the University of Adelaide in 1957 and Dr.sc.nat. from Zurich in 1961. During the past three years he has been a research fellow at the Waite Agricultural Research Institute where he worked on the influence of environment on the structure of starch granules.



Dr. M. S. BUTTROSE

Mr. R. Donaldson has been appointed to the Division of Forest Products to assist in the development and design of electronic measuring equipment and to provide a consultant service on measuring techniques to the Division. Mr. Donaldson obtained a Diploma in Applied Physics from the



Mr. R. DONALDSON

Royal Melbourne Institute of Technology in 1958 and was latterly employed by Battery Manufacturers Pty. Ltd. From 1954-59 he was employed in the Preservation Section of the Division of Forest Products.

Mr. C. H. Gray has joined the Computing Research Section, Sydney, where he will assist in the establishment and operation of a network of computers; he will later use computing equipment in an extension of basic theory and application of automatic data processing to new fields. Mr. Gray graduated B.Sc. (1941) and B.A. (1947) from the University of Sydney, and was formerly a biometrician in the



Mr. C. H. GRAY

N.S.W. Department of Agriculture. From 1942 to 1944 he was employed by De Havilland Aircraft Pty. Ltd. on engineering calculations in relation to aircraft design.

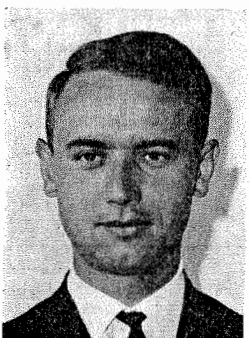
Mr. D. J. McCarthy has joined the Division of Chemical Engineering to assist in the development of a process for the hydrogasification of brown coal. Mr. McCarthy



Mr. J. D. MCCARTHY

graduated B.Sc.App. (Ind. Chem.) and B.E. (Chem.) from the University of Queensland and was previously employed by Albright and Wilson (Aust.) Pty. Ltd. on research and development projects.

Mr. P. Nowakowski has been appointed to the Division of Physics to assist in the



Mr. P. NOWAKOWSKI

research and precision measurement work of the Division in the application of electronic techniques. Mr. Nowakowski is a native of Poland and graduated M.Sc. from the University of Technology, Breslaw, in 1961. He was formerly employed by Telephone and Electrical Industries Limited, Sydney.

Mr. D. F. Pearce has been appointed to Head Office to assist the Research Staff Officer with the recruitment and assessment of scientific and technical



Mr. D. F. PEARCE

staff and generally to assist in the administration of the CSIRO Post-graduate Studentship scheme. Mr. Pearce graduated B.Tech. from the University of Adelaide in 1962 and also holds the Final Paper Making Certificate from the London School of Printing. He was formerly employed as a product development officer with Australia Paper Mills Ltd and his previous experience

included a period as chief chemist for the Wiggins Teape Paper Mills at Shoalhaven, N.S.W.

Mr. D. E. A. Plate, a B.Sc. (Hons.) graduate from the University of Queensland, recently joined the Division of Textile Industry as a post-graduate trainee. Mr. Plate will assist in physical investigations related to wool textile processing and in the development of new machinery and methods. From 1954 to 1960 he worked with the Division of Food Preservation in Brisbane.



Mr. D. E. A. PLATE

Mrs. A. B. Williams has joined the Editorial and Publications Section. Mrs. Williams is a B.A. of the University of Manitoba and will be engaged in general production work and in the editing of semi-technical publications. She was formerly engaged in similar work for the National Research Council, Canada.



Mrs. A. B. WILLIAMS

Mrs. C. J. U. Raab has been appointed to the Editorial and Publications Section to assist with the administrative work of the Section and with the planning and production of the organization's publications. Mrs. Raab, who is a B.A. (Hons.) of the University of



Mrs. C. J. U. RAAB

London, has had extensive experience in the production of scientific books and journals. Her last appointment was with Blackwell Scientific Publications Ltd., Oxford.

SOLAR SYMPOSIUM

A meeting of eighty solar specialists at Sydney recently formulated and discussed plans for the new solar cycle which begins with International Quiet Sun Year 1964-65.

The four-day conference was held under the joint auspices of the University of Sydney and the Divisions of Physics and Radiophysics.

The specialists whose number included radio and optical astronomers, physicists, and electrical engineers, represented eight countries—Canada, Germany, Holland, India, Japan, Thailand, U.S.A., and Australia. Their work will both supplement and complement the research carried out during the last solar cycle which included the International Geophysical Year 1957-58.

In the introductory address to the Conference Professor M. G. J. Minnaert of Utrecht, Holland, said that progress may be expected in practically all of the solar problems.

"Investigations have often moved slowly but steadily until suddenly an unexpected breakthrough resulting from entirely new discoveries has illuminated the problems with a blaze of light."

Examples of such recent new approaches in solar physics included the introduction of plasma theory, the discovery of the far ultra-violet and X-ray spectra through the methods of space research, and the discovery of pulsations in the solar photosphere.

Dr. R. G. Giovanelli, Chief of the Division of Physics, told the Conference that after examining the relative merits of observation from tops of mountains and flat plains he had decided to shift the Division's solar programme to Culgoora, N.S.W.

The solar observatory at Culgoora, 350 miles from Sydney, will include the world's most advanced radio and optical equipment.

The Ford Foundation has contributed \$550,000 towards the cost of the radio installations.

Professor W. N. Christiansen, Head of the Department of

Electrical Engineering, University of Sydney, told the Conference of plans for a 40-second pencil-beam interferometer that would soon be in operation. Operating on 1420 Mc/s, the interferometer will have a resolving power of 40 seconds of arc.

Among other things, it will enable estimates to be made of the temperature on the sun.

An entirely new type of radio spectrograph was described by Dr. S. Suzuki of the Division of Radiophysics.

This spectrograph allows a 10:1 frequency range from 200 to 2,000 megacycles to be covered in one band.

The previous best effort was a 2:1 range.

There were two outstanding sessions during the Conference. One of these was the highly controversial subject of solar seeing. The meeting concluded that instruments mounted on towers 50 feet high or higher were necessary for good observation to avoid thermal and turbulent currents near the earth's surface.

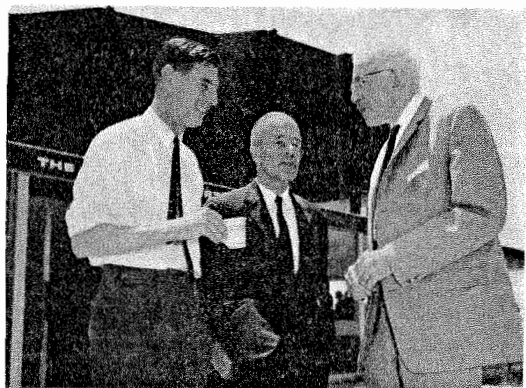
The other session, chaired by Professor Bart J. Bok, dealt with the training of astrophysicists and revealed a wide diversity of opinion on what students should be taught.

After summing up all aspects of the Conference, Professor Minnaert pointed out that concentrated research during the solar cycle would take place on a world-wide scale.

Professor Minnaert added that the most important problem today was the precise understanding of radio phenomena and it would be a great help if the different types of radio-bursts could be related unambiguously to directly visible optical phenomena.

"IQSY 1964-65 will produce an immense amount of data. This will pose a major problem in study, interpretation and correlation," he said.

Dr. J. P. Wild (left) Division of Radiophysics, Professor K. O. Keipenheuer, Fraunhofer Institute, Germany, and Professor M. G. M. Minnaert, Utrecht Observatory, Holland, outside the Stephen Roberts Lecture Theatre, University of Sydney.



Italian Award for Insect Film

The film "Insect Tissue Culture" produced by the Film Unit in collaboration with the Division of Entomology has won a Silver Bucranium award from the University of Padua, Italy.

The Unit previously won a Bronze Bucranium for its film "Biological Control of Insects" in 1960.

"Insect Tissue Culture" is based on the work of Mr. T. Grace of the Division of Entomology, who was the first scientist ever to maintain continuous cultures of insect tissue cells.

The film illustrates the techniques developed by Mr. Grace.

The behaviour of cells both before and after inoculation with polyhedral virus is recorded by time-lapse cinemicrography.

The Silver Bucranium carries the inscription "Silver Brocchio Università di Padova VIII Rassegna Internazionale del Film Scientifico - Didattico 1963."

CORESEARCH

FOR CIRCULATION AMONG MEMBERS OF CSIRO STAFF — NUMBER 60, MELBOURNE, MARCH 1964

"FRONTIER" RESEARCH NEEDED Chairman's Address to ANZAAS

In his Presidential Address to the Thirty-seventh Congress of ANZAAS in Canberra last January, Sir Frederick White called on industry leaders to follow the progress of scientific developments and to accept the responsibility of putting them to practical advantage.

He criticized a "too timid" approach to "frontier" research in Australia and called for appropriate Government policies and increased Government expenditure to encourage it.

Industrial progress, he said, could not be achieved solely by original scientific discoveries, but demanded the initiative of industrial leadership, guided by active Government policy.

He said a major problem for industrial progress was in deciding how Government action could overcome the inherent difficulties that faced private enterprise in entering research and development.

"I believe we must do far more than at present to give greater opportunity to the professional engineer and the professional technologist.

"However great be the scope of our own research, we cannot overlook that Australia is entering international industrial trade at a time of rapid technological change."

Australia could do more to improve the balance of trade by the export of manufactures by providing greater opportunity for science to be deliberately used to introduce new products and novel processes.

Both science and industry must adapt themselves to this new concept.

Sir Frederick said the first essential was that Australia should have as much "frontier" science as possible. As a nation, Australia was being far too timid in providing adequately for it.

The history of modern industrial development showed that the greatest opportunities have had their origins in research at the frontiers of knowledge.

Sir Frederick said the financing of such research, being in

the nature of an investment for the future, called mainly for increased expenditure by the Government.

There were many arguments supporting the contention that there should be a national fund to support meritorious scientific research in all disciplines, irrespective of the institutes in which it was carried out.

He said that research of originality and competence set the high standard of achievement that had repercussions throughout the whole of science.

It would continue to improve our status in international science, and help to prevent what journalists today called the "brain drain" of our better men to overseas.

Sir Frederick said the question of where industrial research in Australia should be undertaken was important.

"While I sincerely hope that there will be a strong growth of research in industry itself, I cannot escape the conclusion that, for some time, the main burden of research must be borne by such institutions as CSIRO and the universities," he said.

"However much research is done in this country, industry must follow the progress of science, foresee new opportunities, and take the initiative in turning these to practical advantage.

"Industry itself must accept this responsibility.

"Many industrial leaders understand the hazards of new enterprises that may emerge from science.

"The assessment of the market, the provision for large financial expenditure for development and manufacture, and the inherent conservatism

against speculative ventures are all problems of immense importance.

"These are problems that must be solved by management and by government."

Sir Frederick said that it was futile to expect scientific discovery to play its part in progress unless industrial and scientific leaders together were able and willing to take the initiative.

"This being so, I cannot escape the conclusion that the responsibility for our industrial scientific future rests principally today with industrial leaders," he said.

"The Government, as in all national matters, has an important role.

"But Government in our society is more likely to act if industrial leaders have clear objectives that call for political assistance and action."

HONOURS

Dr. A. L. G. Rees, Chief of the Division of Chemical Physics and Chairman of the Chemical Research Laboratories Committee has been appointed one of the three elected members of the Executive of the International Union of Pure and Applied Chemistry.

The other two positions are held by members from U.S.S.R. and the Netherlands.

Dr. Rees will leave Melbourne on 17th March to attend a committee meeting of the Executive, and will return on 29th March.

Mr. F. Wilson of the Division of Entomology has been elected a Fellow of the Institute of Biology.

Mr. Wilson is Officer-in-Charge of the Sirex Biological Control Unit, England, and prior to this assignment was Scientific Liaison Officer, London.



EXPLOSIVE RESEARCH

Experiments conducted by Dr. S. D. Hamann, Chief of the Division of Physical Chemistry, and Dr. A. H. Ewald, have established some of the physical changes which occur when water, subjected to suitable explosive forces, has its density increased almost twofold.

Measurements reveal that the shock waves from an explosion necessary to produce this density-increase exert a pressure in the region of 200,000 atmospheres. The calculated temperature is about 1,300°C.

Weak electrolytes given similar treatment respond by becoming highly ionised.

For example, water at a pressure of 160,000 atmospheres becomes as strongly acidic as 5-N hydrochloric acid.

Solid sulphur under the impact of a shock wave becomes an excellent conductor of electricity. This suggests that the sulphur is transformed to a metallic state, but the effect is instantaneously reversible.

Recent work in the U.S.A. suggests that carbon at a pressure of 600,000 atmospheres becomes metallic and workers at the Stanford Research Institute have shown that explosive forces can convert graphite into microscopic crystals of industrial diamond.

The use of explosives in high-pressure work followed recognition of the high cost and basic limitations of machines designed to produce similar physical conditions.

For example, piston devices can produce pressures of 50,000 atmospheres, but pistons may break at a critical time.

Static machinery developed in the U.S.A. and made from tungsten carbide, substitutes a tetrahedron for the conventional cylinder and piston, and can produce pressure up to 500,000 atmospheres.

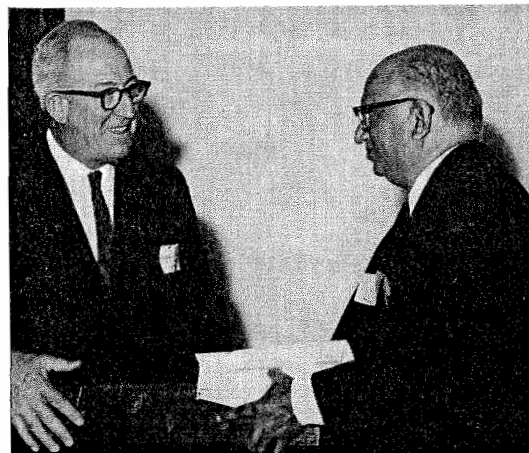
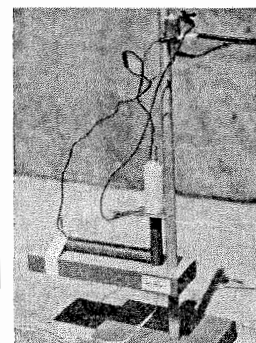
ABOVE: An explosion in a blast barricade at North Head, Sydney. This picture was given an exposure of 1/1000th of a second. Kerr Cell cameras used in providing research photos have an exposure time as low as one ten-millionth of a second.

BELOW: This simple explosive device enables research workers at the Division of Physical Chemistry to produce a pressure of 200,000 atmospheres at a calculated temperature of 1,300°C. in water samples.

Its basic components are a detonator (hidden from view), two sticks of RXD/TNT — one mounted horizontally and the other vertically, an aluminium plate and a plastic cylinder containing a water sample.

The top of the vertical stick of RXD/TNT is connected to an oscilloscope, which is triggered by the explosive front. About one microsecond later the explosion hits the grounded aluminium plate, which transmits the shock wave to the water sample. The shock wave in the water travels at 6 km. per second, and behind it is a layer of very dense gas at a pressure of 300,000 atmospheres.

When the shock wave hits the electrodes seen projecting from the top of the plastic container, the change of electrical conductivity is measured by recording devices. Temperature is calculated using a plausible equation of state.



Dr. S. Hedayetullah presents Sir Frederick White with a cabinet of rice, an official present to ANZAAS from the East Pakistan Government. Dr. Hedayetullah is Head of the Natural Products Division, East Regional Laboratories, Pakistan Council of Scientific and Industrial Research.

To Lead Meat Research

Dr. W. J. Scott, Assistant Chief of the Division of Food Preservation, will lead a team of about thirty research workers in an attack on the many important problems facing the Australian meat industry.

Funds made available from the Australian Cattle and Beef Research Committee will enable the Division to build a new meat research laboratory and to expand its present meat research staff from ten to thirty over the next few years.

The laboratory will be built on a 13 acre site at Cannon Hill, Brisbane, close to the Division's present meat research laboratory which was

established more than thirty years ago.

After graduating in Agricultural Science at the University of Melbourne, Dr. Scott joined CSIRO in 1933 to work at Cannon Hill on the preservation of chilled beef.

He has been leader of the Division's microbiology group in Sydney since 1940 and became Assistant Chief of the Division in 1960.

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TEXTILE INDUSTRY IN JAPAN

In the last four years mill consumption of wool in Japan has risen more than in any other major wool-using country, and Japan has now replaced Britain as the largest purchaser of Australian wool. Rising standards of living and the adoption of Western dress are among factors which have contributed to Japan's greatly increased wool consumption.

Most of this wool is processed near Nagoya about 150 miles from Tokyo.

This area, which contains one of the highest concentrations of worsted spindles in the world, might be termed "the Bradford of Japan".

Most of the Nagoya area was destroyed during the War and the mills are now housed in new and modern buildings.

By Dr. M. Lipson,

Chief of the Division of Textile Industry, who visited Japan late last year.

At Ichinomiya, fairly close to Nagoya, the International Wool Secretariat has established a Technical Centre which is being used to extend latest techniques in wool finishing to the Japanese textile mills.

Dr. Bekku, who visited CSIRO about two years ago, is Technical Manager for the I.W.S. in Japan and has an enthusiastic and able group of technologists working at this Centre.

They are actively engaged in introducing shrinkproofing and setting processes into the mills and are providing a useful service in extending CSIRO research results to industry.

So far, forty licences have been issued for the SI-RO-SET process.

The estimated number of garments to be treated by SI-RO-SET this year is over one-half million.

The CSIRO shrinkproofing process is operated under a trade mark "NEVA-SHRINK" and commercial production commenced in February, 1963.

There were 15 licensees including the largest wool finishing plant in Japan.

Output of treated knitwear is expected to be over one-quarter million garments in the first year.

This should increase considerably as the I.W.S. technical programme develops.

Shrinkproofing treatment was given to 25,000 metres of woven fabric in spring 1963.

Travelling with Dr. Bekku as interpreter, I was able to see something of Japan's wool industry and meet many mill people.

Although most of Japan's wool textile production is carried out by large textile companies, there is a proportion of high class production from smaller mills, some of which still use hand looms.

One such mill visited in Kyoto was producing extremely high quality wool/silk mixture fabrics of unusual design used mainly for kimonos.

The large companies are mainly vertical producers of fabric with mills processing other fibres such as cotton and synthetics as well as wool.

In some cases, they produce synthetic fibres as well.

The Toyo Spinning Co., which is the largest textile company in Japan, has a large research institute employing about 600 in Swiss-like surroundings near Kyoto.

Investigations cover a wide range of subjects from the synthesis of new fibres, to the shrinkproofing of wool.

This firm has developed a system of cotton spinning which is probably the most advanced instance of automation in the textile industry.

I saw a mill of 30,000 spindles operating in this way

Instruction in flower arrangement for girl employees at Chuwa Wool Industry Co., Japan.



and was impressed by the way in which machines have been developed to eliminate some of the conventional manual operations.

Departmental managers in the larger mills are usually post-war textile graduates and display great enthusiasm and a thirst for new knowledge.

In Japanese mills, most of the employees live on the site and management takes an interest in their general education and welfare.

They are housed in modern, clean quarters with facilities for sport and other recreational activities.

I visited one of these centres, and, at the time, several of the girls were being taught flower arrangement and the tea-making ceremony.

I was surprised to learn that there is an export trade from Britain to Japan in wool textile materials, although this is not a huge market.

One man I met had just returned from Britain. He was the head of an importing company in Osaka and their main line of imports was high-class British fabrics, such as West of England woollens, which cater for the top price market.

Evidently there is a good outlet for high quality expensive products of this type in Japan.

It is likely that Japan will continue to remain a large customer for Australian wool because of the high regard there for natural products.



Freckled Ducks

As part of its programme of research on the ecology and behaviour of wild ducks, the Division of Wildlife Research maintains a collection of waterfowl at its headquarters at Gungahlin.

The Division was recently successful in securing several specimens of the Freckled Duck, *Stictonetta naevosa*, to add to this collection.

The Freckled Duck is a rather rare species in Australia and it is believed that these are the first to have been held in captivity.

Its taxonomic position is obscure but this should be cleared up from the projected behavioural work.

Four of the six ducks now in the collection were secured

by a farmer co-operator in Western Australia, Mr. Reg Taylor, who found a nest and collected the ducklings when they hatched.

These ducklings were raised to an independent stage in the Division's laboratory at Perth before being transferred to Gungahlin.

Our picture shows one of the new Freckled Ducks being subjected to an unfriendly greeting by one of the older residents in the collection, a Grey Teal.

SEATO Bursaries

The South-East Asia Treaty Organisation is offering a limited number of fellowships for post-graduate research during 1964-65.

Research projects should relate to the scientific, cultural, economic, or other problems of countries in South-East Asia or the South-West Pacific and should be in accordance with the aims of SEATO.

Grants will normally be for a period of from four to ten months.

They cover economy-class return air fares and an allowance of about £180 a month.

Applications close on April 2 and forms and further information may be obtained from the Secretary, Department of External Affairs, Canberra.

TECHNICAL ASSOCIATION NEWS

Central Council of the Association wishes to place on record its profound regret at the recent death of Dr. Stewart Bastow.

Dr. Bastow had consistently shown a marked interest in the Technical Staff, especially the experienced Technician who had received inadequate recognition of his skill.

We found that discussions with Dr. Bastow were conducted in an informal but lively manner which left no doubt that he had a vital interest in all problems affecting CSIRO staff. Council deeply mourns his passing and hopes that his successor will develop the same interest in the technical staff as the late Dr. Bastow.

By this time all members should have received a copy of the first of a series of Information Bulletins designed to keep the membership more aware of the activities and achievements of the Association. The first one, appropriately enough, dealt with the Public Service Arbitrator's Decision on the "Technical Grades Case" for AAESDA.

Any member who did not receive a copy should contact the Divisional delegate or the Branch Secretary.

It is hoped that by the time this article is printed and distributed that negotiations with the Secretariat on the implementation of the salary rise will be complete.

It will then be necessary for the Association to decide whether the rises in the grades are adequate and whether we should proceed with the present Memorial. The latter, of course, may need some amendment.

This would involve accelerating the Work Value survey, especially that part being conducted by Mr. Ross and the Sub-committee. Any member who feels strongly on this subject should contact his branch Secretary or the Work Value Sub-committee.

TREATED FENCE POSTS

Round pine posts treated by a process which the Division of Forest Products has actively developed are being used for the first time in the rabbit- and dog-proof fence between New South Wales and South Australia.

The six feet high fence protects western pastoral areas of New South Wales from dingoes and runs for 375 miles from a point fifty miles north of Broken Hill to the Queensland border.

In past years the fence has required extensive maintenance.

A consignment of four thousand posts obtained from A.C.T. forests recently left a commercial Queanbeyan processing plant for Broken Hill.

The treated pine posts, 4 to 5 inches in diameter and 8 feet 6 inches high cost less than half the price of the metal posts they are replacing.

The life expectancy of properly treated round posts exceeds thirty years and treatment prices range from £10 to £15 per hundred.

The preservatives used in the treatment of pine posts include creosote oil and a waterborne

copper-chrome-arsenic mixture. These are injected at a pressure of 200 pounds per square inch.

The treatment of non-durable timbers by the preservative process results in considerable savings, as the prices of split posts of durable wood are usually high.

The Division of Forest Products has been active for more than thirty years in the development and application of treatments for fence posts.

ANTI-SIREX CAMPAIGN

A laboratory has been built at Silwood Park, Berkshire, England, to house the Division of Entomology's Sirex Biological Control Unit in Europe.

The Unit has been set up to search European countries for parasites of the Sirex wasp, Australia's number one pest of pine forests.

Parasites will be sent to Hobart for further investigations by the Division, and those which show promise will be released in an attempt to control Sirex.

Mr. F. Wilson, formerly Scientific Liaison Officer, London, is Officer in Charge of the European Unit which will eventually have a staff of five people.

Mr. Wilson was, for some years, in charge of biological control work in the Division of Entomology.

The Unit will work in close contact with the Commonwealth Institute of Biological Control.

The Institute's Director, Dr. F. J. Simmonds, recently visited Australia to gain a first-hand impression of the status of biological control work in this country.

Sirex parasites have already been obtained from India, North America and New Zealand. The New Zealand species are American in origin.

So far, two of these parasites have been released in Australia.

The first of these, the *Italia* wasp, is an egg parasite. It was released in Victoria nearly two years ago and is known to have bred through one generation.

A second parasite, *Rhyssa persuasoria*, was released in Victoria in December. *Rhyssa*, a larval parasite, attacks grubs and pupae.

Sirex attack is limited to softwoods, mainly pine, and in Victoria infestation appears to be limited to *Pinus radiata*.

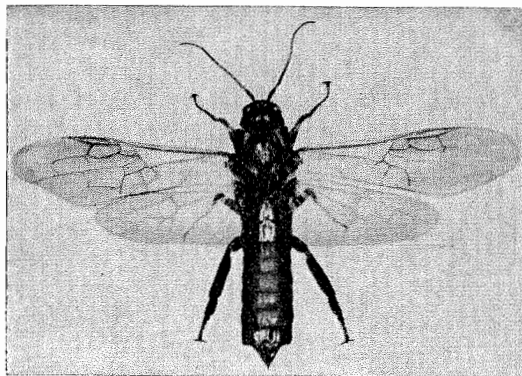
Australian *radiata* plantations are valued at £65 million and Sirex could cause tremendous damage if left unchecked.

The Sirex wasp was accidentally introduced into New Zealand sixty years ago. It was

Since the National Sirex Campaign Fund was begun in February, 1962, more than £200,000 has been spent on anti-Sirex work in Victoria.

The Tasmanian work is carried out by the Forestry and Timber Bureau, the Waite Institute and the Division of Entomology.

The Forestry and Timber



Above: Adult Sirex Wasp.

discovered in Tasmania about eleven years ago, and was first noticed in Victoria in January, 1962.

More than £400,000 has been paid into a special Sirex control fund — mostly by the Federal Government. State Governments contributed most of the remainder.

Funds are at present expended on the Victorian eradication campaign and on research conducted in Tasmania.

Bureau is studying silvicultural practices, tree physiology, tree breeding and the symbiotic fungus thought to kill trees which have been attacked by Sirex.

The Waite Institute is also studying the Sirex fungus, and the Division of Entomology is studying the biology, ecology and biological control of Sirex.

Israeli Geneticist

After a recent visit to the Division of Plant Industry in Canberra, Dr. Dan Atsmon of the Weizmann Institute of Science, has returned to Israel with the conviction that Israeli scientists should learn as much as possible from their Australian counterparts in tackling specific problems such as drought.

Dr. Atsmon's trip to Australia was largely financed by the Rockefeller Foundation.

The trip was undertaken to integrate all available information concerning plant-water relations, particularly drought resistance.

This information will be used in an attempt to breed for increased drought resistance in crops such as wheat and barley.

Dr. Atsmon collected detailed information on the Canberra phytotron, as Israel intends building a similar structure.

He also visited the Division of Land Research and Regional Survey and paid particular attention to the work on the measurement of water potentials and water measurement inside and outside plants.

Dr. Atsmon said that such measurements might reveal important varietal differences in stomatal behaviour (and other factors) which control water loss from plants. These differences could lead to selection of plants with a high economy of water use.

In Brief...

Mr. J. D. Dunsmore, of the Rabbit Biology Section of the Division of Wildlife Research, has been awarded a Ph.D. by the University of Sydney. His thesis was concerned with a parasitic sheep disease.

Mr. J. W. Gottstein, of the Division of Forest Products, left Australia recently on a FAO assignment to Chile. He is to advise the Chilean timber industry on the manufacture of plywood from *Pinus radiata*.

Mr. T. Paltridge has been seconded to the Commonwealth Office of Education to act as Secretary to the UNESCO Natural Sciences Committee.

Mr. Paltridge was formerly Chief Scientific Liaison Officer at A.S.L.O., Washington, and completed his tour of duty there in September, 1961.

Visitors from Overseas

Dr. R. S. Cahn, Director of Publications Research for the Chemical Society of London, will arrive in Perth on 14th March and later visit Melbourne, Sydney and Canberra. He will make a survey of Australian chemical publications. Dr. Cahn will be the guest speaker at a Symposium at Melbourne University on Wednesday, 25th March. His subject will be "The Future of Chemical Publications".

Dr. I. E. B. Fraser, of the New Zealand Wool Research Organization, is spending two years as a guest worker at the Division of Protein Chemistry. Dr. Fraser is investigating the structure and the chemistry of wool roots and the mechanism of wool growth.

Mr. S. J. Holt, Chief of the Biology Branch, F.A.O. Fisheries Division, Rome, arrived in Australia on 20th February to spend one month at the Division of Fisheries and Oceanography. He will advise on new developments and methods in fisheries research.

Mr. M. A. Husain is visiting Australia for twelve months under the Colombo Plan to obtain practical training in the analysis of food products. Mr. Husain is from the East Pakistan Central Testing Laboratories and will visit the Division of Dairy Research in March and the Division of Food Preservation in July.

Mr. A. Jacquiel, technical manager to a farmers' co-operative food processing factory in France visited the Division of Food Preservation in February during the course of a world tour. Mr. Jacquiel has special interests in sterilizing and vacuum-packing techniques.

Mr. M. Lea, from the Northwestern University, Illinois, arrived in Australia in January to spend one year working with Mr. T. Grace, of the Division

of Entomology, on insect tissue culture.

Dr. T. Kayama, Officer in Charge of the Pulp Laboratory, Forest Products Chemistry Division, Meguro, Japan, has been granted a senior research fellowship to enable him to work for one year in the Wood Chemistry Section of the Division of Entomology, on insect tissue culture.



Dr. T. KAYAMA

sion of Forest Products. Dr. Kayama's previous work has included the study of decayed wood as a raw material for paper pulp. In Melbourne he will examine the effect of fibre bleaching on the quality of paper.

Professor V. Prelog, a leading organic chemist from Zurich will visit Australia this month to deliver the Andrews Lectures at the University of New South Wales. Professor Prelog will also visit the Division of Organic Chemistry, Melbourne, on 16th and 17th March.

Professor A. Starker Leopold, Zoology Department, University of California, will arrive in Australia this month to spend six months sabbatical leave at the Division of Wildlife Research. Professor Starker Leopold will study the wedge-tailed eagle and its predation on lambs.

... by Any Other Name

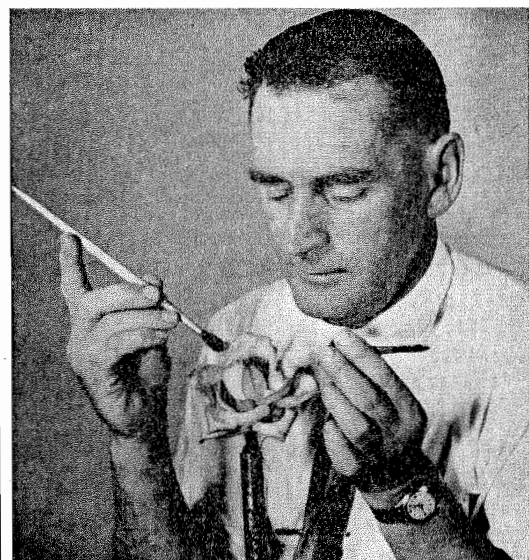
Wallace Hastie, photographer at the Division of Forest Products, is an active member of the National Rose Society, Waverley Garden Club, and Box Hill Horticultural Society, and has had many successes in recent years with his roses.

At the last spring and autumn shows of these Societies, Wallace has collected for single blooms, nine firsts, seven seconds and best rose of the show twice, and for mixed bunches, three first and two seconds.

Wallace is very modest about his success. "Roses grown for exhibition are not 'special' in any way", he says, "except that a certain amount of work has been applied to make a staged rose look perfect".

However, Wallace then blasted the average gardener's hopes by saying, "To obtain a perfect rose, the exhibitor has to take into account a few factors, particularly the stage of growth, amount of feeding, time of picking, prevailing weather, temperature and humidity of the exhibition hall, and degree of manipulation".

Below: Wallace Hastie preparing a rose for exhibition.



NEW COACH FOR PUFFING BILLY

A coach from the Mount Lyell Mining and Railway Company's famous line from Queenstown to Strahan on the west coast of Tasmania has been donated by the Mount Lyell Company to the Puffing Billy Preservation Society of Victoria.

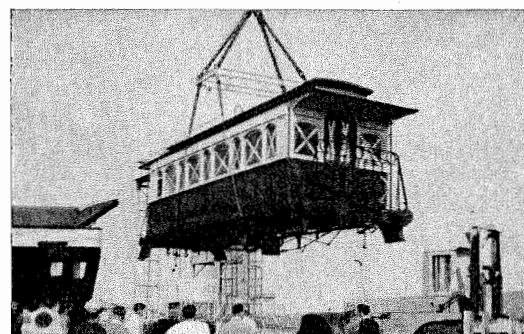
President of the Society, Mr. A. P. Wymond, of the Division of Forest Products, said that the coach will be fully restored to its original condition and should be ready for running in the coming winter.

The coach will be fitted with air brakes, new couplings and 2 ft. 6 in. gauge bogies.

This coach is one of four which for sixty years provided passenger transport between

Queenstown and Strahan.

Mr. Wymond said that the Society had plenty of vacancies for volunteer workers in any capacity, and those interested in playing with real trains should get in touch with him.



Below:

Passenger coach from Queenstown, Tasmania, being unloaded at Melbourne. This coach will be used on the Puffing Billy railway, Belgrave, Victoria.

APPOINTMENTS TO STAFF

Dr. O. H. Caso has been appointed to the Division of Plant Industry to investigate the physiology of regenerating buds on excised roots of skeleton weed, and to develop means of chemical control. Dr. Caso graduated D.Nat.Sci. in 1952 from the University of La Plata, Argentina. Since 1958 he has been a Plant Physiologist at the Institute of Botany, Buenos Aires.

Mr. N. I. Robinson has been appointed to the Division of Building Research to assist in the operation and development of methods of measuring de-



Mr. N. I. ROBINSON

formation in buildings. He will also study the design of chambers for steam and gas curing of concrete. Mr. Robinson graduated B.E. (Mech.) Melbourne University in 1963.

Mr. A. H. Chalmers, a B.Sc. graduate from the University of Adelaide has joined the Division of Organic Chemistry where he will assist in the determination of the structure of alkaloids and other physio-



Mr. A. H. CHALMERS

logically-active substances. Mr. Chalmers was formerly employed by the Commonwealth Department of Customs and Excise, Port Adelaide, as a Food Analyst.

Miss M. J. Clark has joined the Division of Wildlife Research where she will assist in studies of kangaroo reproduction, particularly that of the red and grey kangaroos. Miss Clark graduated B.Sc.(Hons.) from the University of Adelaide 1963 and her Honours project concerned the excretory function of the red kangaroo.

Mr. A. C. Dilley, a recent B.Sc. graduate from the University of Melbourne, has joined the Division of Meteorological Physics. He will assist



Mr. A. C. DILLEY

the Micrometeorology group with the design and development of techniques for its lysimeter programme.

Mr. M. J. Fisher has been appointed to the Division of Land Research and Regional Survey, Katherine, to participate in an experimental programme on the field agronomy of arable crops including pea-



Mr. M. J. FISHER

nuts, cotton and grain sorghum. Mr. Fisher graduated B.Agr.Sc. from the University of Melbourne in 1958 and then joined the Department of Agriculture, Tasmania, where he worked as an Agronomist.

Mr. D. K. Ginzburg has joined the Division of Animal Health where he will assist in chemical aspects of research



Mr. D. K. GINZBURG

projects related to chemical pathology. Mr. Ginzburg was formerly a graduate assistant at the University of New South Wales, synthesizing a fungus pigment. He graduated B.Sc. from the University of Sydney in 1962.

Mr. W. J. H. Jackson has been appointed to the Division of Food Preservation where he will work in the Physical



Mr. W. J. H. JACKSON

Chemistry Unit assisting in the investigation on the contractile proteins of muscles. Mr. Jackson is a B.Sc.(Hons.), 1963, graduate from the University of Sydney.

Dr. D. J. Minson has joined the Division of Tropical Pastures and will work at the Cooper Laboratory, Lawes, Queensland. He will investigate the nutritive value of pasture species, paying particular attention to pasture intake. Dr. Minson graduated B.Sc. from the University of Reading in 1953 and Ph.D. from the same University in 1958. Since 1953 he has been employed at the Biochemical and Animal Nutrition Department, Grassland Research In-

stitute, Hurley, U.K. In 1961 he was granted leave of absence to work on silage at Ruakura Animal Research Station, Hamilton, New Zealand.

Dr. F. R. A. Jorgensen has joined the Division of Mineral Chemistry where he will be responsible for developing new



Dr. F. R. A. JORGENSEN

techniques for the chemical treatment of Australian ores. Dr. Jorgensen graduated B.E. (Hons.), 1959, and Ph.D., 1963, from the University of Adelaide. Since 1961 he has been a CSIRO post-graduate student working on the high-temperature oxidation of iron in carbon dioxide.

Mrs. S. Keene, a B.Sc.(Hons.) graduate of the University of London, has been appointed to the Division of Fisheries and Oceanography, Cronulla, to assist in a histological study of the structure of the pituitary glands of whiting. Mrs. Keene's previous experience has in-



Mrs. S. KEENE

cluded that of microbiologist at the Western Food Research Laboratories, Maidenhead, and Research Assistant at Queen Elizabeth College, London University.

Mr. G. S. Masters has joined the Computing Research Section to assist in the establishment and operation of the



Mr. G. S. MASTERS

Section's computing network. Mr. Masters graduated B.Sc. from the University of Sydney in 1962 and in 1963 he obtained a Diploma in Numerical Analysis and Computing.

Mr. I. Vallis has joined the Division of Tropical Pastures to assist in work on plant and soil aspects of the nitrogen economy of tropical pastures.

In Sturt's Tracks

Stan Hopwood, a photographer at the Division of Radiophysics, returned recently from an eight day tour of the outback. With two companions, Stan followed the route taken by explorer Charles Sturt across the Stony Desert more than a century ago.

Their route took them through western N.S.W. and north-eastern S.A. to Birdsville in Queensland.

The return trip was made down the Birdsville track to Maree and back to Sydney via Adelaide.

The rear seat of their Volkswagen was replaced by a single fibreglass seat, leaving room for stowage of 20 gallons of petrol, 8 gallons of water and a collection of tinned foods.

Amalgamated Wireless (Australia) Ltd. equipped the car with a transceiver radio and the three travellers joined the Royal Flying Doctor network under the call-sign "8 November Hotel Tango".

Testing reception later, they were twice in contact with Broken Hill—once from just south of Birdsville, 400 miles away, and again from deep in the Flinders Ranges.

Recalling his experiences, Stan said that Tibooburra, in the north-western corner of N.S.W., has recently had a small local industry curtailed—fossicking for gold in the main street after a rainstorm.

The Town Council has now paved the street and driven the fortune hunters to the back alleys.

The Stony Desert, crossed by Sturt's party in 1846, is desolate and well-named.

Travelling across the desert in temperatures well above the century, Stan and his companions found that a heavy haze obscured the distance, and all horizons seemed to be elevated.

"It was like travelling across a gigantic rubble-strewn saucer," said Stan.

"The desert is a featureless stony plane, except for an occasional white clay pan, and the stones average about three inches in diameter.

"Our speed was reduced to ten miles an hour."

Birdsville, after the rigours of the desert, was a haven of civilization, but expenses were high—beer 3/6 a half-bottle, petrol 7/- a gallon.

The party made a successful 27-mile trip down the Birdsville track to Maree.



Within hailing distance of Maree after crossing the Stony Desert.

"We had to be careful fifty miles south of Birdsville," said Stan.

"After heavy winds across the sand dunes of this region, the track practically disappears.

"Further south, the Birdsville track is a wide, well-graded road."

The trip occupied eight days and covered a total of 3,500 miles.

Mr. Vallis graduated B.Sc. from the University of Queensland in 1963 and has recently completed an Honours Course in soil fertility.

Mr. W. Muller, a B.E.E. graduate from the Technical University of Delft, Holland, has joined the Division of Applied Physics where he will develop and maintain electronic apparatus for optical interferometry. Mr. Muller was formerly



Mr. W. MULLER

in the Radio Section of the P.M.G. Department and at one time was responsible for propagation measurements and choosing sites for proposed radio-telephone stations.

Dr. G. F. Van Tets has joined the Division of Wildlife Research to conduct research on the behaviour and ecology of birds, especially the silver gull, in the vicinity of Australian airfields. Dr. Van Tets graduated B.A.(Hons.) from the



Dr. G. F. VAN TETS

University of British Columbia in 1956 and obtained his Ph.D. from the same university in 1963. He has previously carried out a comparative study of the breeding behaviour of the cormorant and its allies on small islands in the northern hemisphere.

APPOINTMENTS VACANT

The following vacancies for professional appointments are current:—

EXPERIMENTAL OFFICER (E.O. 1/2)—Division of Soils, 270/280 (20 March 1964).

EXPERIMENTAL OFFICER (E.O. 1/2)—Division of Wildlife Research, 560/134 (18 March 1964).

RESEARCH OFFICER (R.O./S.R.O.)—Division of Textile Industry, 462/192 (20 March 1964).

RESEARCH OFFICER (R.O./S.R.O.)—Division of Animal Health, 201/223 (13 March 1964).

SENIOR RESEARCH OFFICER (S.R.O./P.R.O.)—Division of Physics, 770/273 (13 March 1964).

C O R E S E A R C H

FOR CIRCULATION AMONG MEMBERS OF CSIRO STAFF — NUMBER 61, MELBOURNE, APRIL 1964

UNESCO

ASIAN RESEARCH CONFERENCE

CSIRO was the host institution for the Third Regional Meeting of National Scientific Research Organizations of South and South-East Asia convened by UNESCO. The Meeting was held at the Academy of Science, Canberra, from 17th to 21st February. Previous meetings were held in Hong Kong in 1961 and Bandoeng in 1959.

A total of forty-five scientists from seventeen countries attended the Meeting which was opened by Senator Gorton, Minister-in-Charge of CSIRO. The opening ceremony included an address by M. René Maheu, Director-General of UNESCO, and Sir Frederick White was Chairman of the Meeting.

An Australian delegation of six was led by Mr. G. B. Grestford and included representatives of CSIRO, the A.N.U., the Department of External Affairs, and private industry.

The Meeting was regarded as a Regional follow-up of the U.N. Conference on the Application of Science and Technology to Development held in Geneva in 1963.

The major question underlying the discussion was how best could science be brought to play its part in the processes of economic development.

At a cocktail party held at the Hotel Rex, Canberra, Mr. G. A. Stewart, Chief of the Division of Land Research and Regional Survey, greets some of the delegates to the Third Regional Meeting of National Scientific Research Organisation of South and South-East Asia.

The theme of the Meeting, as defined by M. Maheu, was the examination of methods of formulating and executing desirable national scientific policies.

Each of the countries represented at the Meeting presented a statement on the national arrangements made for science in the machinery of government and on the significant developments that had occurred recently in science organization and scientific research.

The working sessions were devoted to discussions of the need to integrate scientific and economic planning, the organizational and administrative arrangements to be made for science, planning for technological education and manpower programmes, and the role which UNESCO might play in each of these matters.

Statements on these questions were given by a number of consultants invited by UNESCO.

The consultants came from U.S.S.R., Japan, India, Indonesia and U.S.A.

In addition, CSIRO presented a statement on Research Administration, and Dr. G. F. Humphrey, Chief of the Division of Fisheries and Oceanography led the discussion on Regional Collaboration in Research.

It was apparent that each of the participating countries highly valued UNESCO's activities in the Asia region.

These activities will increase significantly if the draft UNESCO Budget for 1965/66 is adopted by the U.N. Economic and Social Council.



HONOURS FOR FOUR

Mr. G. Alexander of the Division of Animal Physiology, has been awarded the degree of Doctor of Agricultural Science by the University of Melbourne for his thesis on the mortality rate and survival possibilities in new-born lambs. This is the first occasion the degree has been awarded by the University of Melbourne.

Mr. J. David of the Division of Plant Industry has been awarded the degree of Doctor of Science by the University of Western Australia.

His thesis was entitled "Studies in Emission and Atomic Absorption Spectrochemical Analysis".

Dr. D. F. Martyn, Officer-in-Charge of the Upper Atmosphere Section, has been elected to serve a four-year term as a national representative on the Executive Committee of the International Council of Scientific Unions.

The Executive Committee contains ten national members who are elected from among all the countries which adhere to ICSU.

ICSU is the parent body of all the International Scientific Unions and their various joint Committees such as ICSAR, COSPAR, SCOR and the IQSY Committee.

Mr. B. J. Rigby of the Division of Textile Physics has been awarded a Swedish Jeton for his work on the properties of collagen.

The award is a personal one from Professor K. H. Gustavsen of Stockholm, a member of the Royal Swedish Academy of Science.

The Jeton, a silver medal, was struck in 1815 when Berzelius was made Secretary of the Swedish Academy.

Mr. Rigby's work on collagen, in the form of mammalian tendons, has dealt largely with its mechanical properties under conditions approaching its in vivo state.

Agricultural Liaison

The Executive has decided that the Agricultural Research Liaison Section will now be part of Head Office Secretariat operating as an agricultural liaison unit under an Assistant Secretary.

Mr. R. D. Croll has been appointed Acting Assistant Secretary.

The writing of Rural Research and various leaflets and longer publications will continue.

The other liaison work of the group will revolve very largely around the technical conferences which are held each year under the auspices of the Australian Agricultural Council.

Townsville Laboratory

Tenders were called recently for a laboratory to be built for the Division of Tropical Pastures on a fifty-acre site adjacent to the University College of Townsville. The laboratory will be a centre for research into pastures, soils and animal health problems in northern Queensland.

The ancillary buildings will include a large glasshouse for growing plants under controlled conditions.

Chief of the Division, Dr. J. Griffiths Davies, said that good progress had been made in recruiting research staff and all position should be filled during 1964.

The laboratory will have a total staff of about fifty.

The Division's research programme in Townsville is at present proceeding from a temporary laboratory at King Street, and a vigorous programme of testing new introduced pasture species is in progress several miles away at Lansdown Pasture Research Station, Woodstock.

By overcoming stock nutritional deficiencies through the development of improved pastures and fodder crops the improve calving percentages, research programme should help to raise stocking rates, reduce losses of breeders, produce marketable animals at

younger ages and stabilize the production of store animals.

Research will be conducted in the Townsville hinterland, Cairns hinterland, northern brigalow lands, the northern spear grass region and the pastoral regions.

At present over two million beef cattle, about one-third of Queensland's beef cattle population, are carried in these regions.

Present expectations are that in many places production can be increased several fold.

Not Cricket?

Batsmen of the Chemical Research Laboratories were the victors at their cricket match with Tribophysics early last month.

Tribophysics accepted their defeat in spite of a brilliant maiden game by American recruit Ron Armstrong.

Tribophysics selectors and supporters anticipated that in throwing the bat around after the strike Ron might reduce the batting strength of the opposition.

This, however, proved to be optimistic since his aim was not as accurate as had been hoped.

Dinner Dance

Melbourne Divisions and Sections will hold their annual Dinner Dance on Saturday, 7th May, at the Royale Ballroom, Exhibition Buildings, Melbourne.

Tickets are seventy shillings (double) and bookings can now be made.

Divisions and Sections are being encouraged to display an appropriate motif and prizes will be made for the best display.



The Irrigation Research Station, Griffiths, provided a major display at the recent Trade Fair organized by the Griffiths Apex Club and attended by ten thousand people. Visitors passed through a tunnel representing a plant, and traced the path of a molecule of water in its journey from the soil via the plant to the atmosphere. Local farmers showed particular interest in the section of the exhibit devoted to cotton in which a small roller gin was in continuous operation. Other parts of the exhibit dealt with soils, drainage, and citrus quality.

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TEKTITES

Theory, Fact and Legend

Strange glassy objects called tektites (from the Greek *tektos*, melted) are found scattered in many thousands at several sites across the earth's surface, and have given rise to much speculation concerning their formation. One widely accepted theory is that tektites are solidified chunks or droplets of lunar material melted and splashed into space when large meteorites crash into the moon.

Australites, the tektites found in Australia, have the best shapes of all tektites and have recently become objects of study by the U.S. National Aeronautics and Space Administration.

Scientists from N.A.S.A. visited Australia last year to contact Dr. G. Baker of Mineralogical Investigations, Melbourne, and to examine the Port Campbell district in Victoria where more than two thousand tektites have been found.

The importance of specimens collected from this area lies in the fact that they have well-preserved shapes and structures and as such they provide significant data relative to the aerodynamics of entry.

In the dawning era of the Space Age, studies of their sculptured surfaces and of their configurations have attained some importance. These configurations arise from modification of the primary forms by a

phase of ablation, brought about by aerodynamic heating to 2,500°K.

This importance relates particularly to the nature of heat shields on manned spacecraft, and the development of aerodynamical sculpturing on the nose cones of guided missiles after re-entry into the atmosphere.

Calculations on a high-speed digital computer at the N.A.S.A. Research Center in California have shown that the initial speed of entry of australites was in the region of 27,000 miles per hour, and that the initial angle of entry into the earth's atmosphere was only a few degrees above the overshoot boundary.

These calculations were based on precise measurements

Searching for australites on an old road near Port Campbell. The road was made by scraping off the surface material down to the hard-pan layer.

of the form and structure shown by the best of the well-preserved australite buttons from Port Campbell.

The largest tektite found on the earth weighs approximately seven pounds and the smallest less than one-tenth of a gram.

Tektites, named according to their major site of occurrence, are composed of silicate glass, and they are all generally similar in chemical composition.

Their shapes are typical of those assumed by molten silicate glasses rapidly heated and ejected as droplets and then rapidly cooled, resulting in spheres formed instantaneously without rotation, together with such forms of revolution as spheroids, dumbbells, apoids, and so on.

In the Port Campbell region of southern Victoria, australites are found exposed on borrow pits, on an old road, and partially buried in soils.

Dr. Baker first investigated this area in 1935 and has collected from it regularly each year.

Tektites superficially bear a chemical resemblance to acid igneous rocks, but they have a recognizable chemical character when compared with rocks of the same silica range.

For example, their content of calcium, magnesium and iron is high, that of sodium and potassium is low.

It is likely that the major part of the sculpturing of the least-weathered tektites is of aerodynamic origin, and Dr. Baker has proposed a theory to account for this.

Support for his theory comes from the striking resemblance between natural and artificially prepared tektites, and the markings seen on ablation nose cones of rockets fired from the Marshall Space Flight Center, U.S.A.

Apart from their geological and astronomical importance, considerable cultural interest attaches to australites.

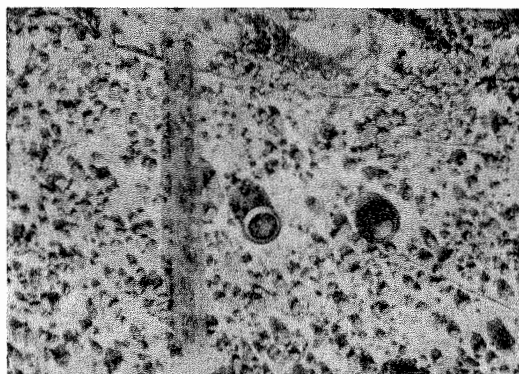
They were at one time called "black fellow buttons" but only in a whimsical sense, and many of them were treasured by aborigines as medicine-stones, death-pointers, magic stones, and so on.

The reasons for their varied use by the aborigines are probably due to the curious and symmetrical shapes possessed by most well-preserved australites and partly to their small size and glossy nature when fresh.

They are black in reflected light, yellowish bottle-green in transmitted light and their most common shape is round in plan and lenticular in side aspect, sometimes with an encircling circumferential flange.

The Australian natives were the first to theorize about the origin of australites and the Wadjalk tribe in South Australia referred to them as *mindjimindjipara*, translated as meaning "eyes that look at you like a man staring hard".

Other tribes inhabiting the Warburton Ranges, South Australia, believe that australites fall from the sky and occasionally one enters a man who then becomes ill or "possessed".



In the Coolgardie district of Western Australia natives used buttoned-shaped australites as charms to drive away illness.

But the aborigines of the Warburton Ranges and Ooldea, South Australia, regarded australites as the cause of sickness, pain or devil possession.

The witch doctor would assure his patients that these blackstones were the cause of his illness and then proceed either to rub or suck at the affected part while performing a ritual.

He finally "palmed" an australite from the patient's body, or, if he had used the sucking technique, he spat out a previously concealed australite from his mouth.

Australites alone, never any other stones, were used in this faith-healing procedure.

In contrast to the use of australites as medicine-stones, certain tribes believed in their destructive powers.

Native possessors of australites in some areas of south-western parts of Western Australia were supposed to have the power of bewitching their enemies, tormenting them with all kinds of disease and finally destroying them.

A native sorcerer in Queensland was credited with having a number of australites in his stomach and this was the secret of his power; the more he had, so much the greater his vitality and magic power.

Two australites from Mount Margaret, Western Australia, now in the Australian Museum, Sydney, were regarded by the natives of that district as being of great value in the transmission of messages.

They were carried about in the bags of medicine men and when in use were secreted in their beards; this gave them a power, supposedly exuded through the navel, to receive and transmit messages over long distances.

Australites found at Port Campbell placed alongside a six-inch ruler. Note the circumferential flange on the australite nearer the ruler.

The sharp edges of australite fragments render them eminently suitable for use by the medicine man and elders of the tribe as surgical instruments.

In the Ethnological Collection of the Perth Museum, Western Australia, a shaped australite fragment from Red Hill, Western Australia, is labelled as "Chip of australite, worked and used as a knife by an aborigine".

It was evidently used in the aboriginal religious rite of *larna* (circumcision).

One of the more practical applications for australites by aboriginal man in Australia concerns his food hunting methods, particularly for emus.

Natives of the Woomera region in central Australia loosely bind up a number of australites in balls of emu feathers and throw them on to the feeding grounds of these birds.

The aborigines, camouflaged, await the approach of the emus.

The birds are attracted to these balls of feathers and while trying to extract the australites and swallow them as gizzard stones, they are speared by the aborigines.

The search for australites is often unrewarding for amateurs, who, confused to the point where they may refer to australites as "israelites", have returned from days of searching to be told that their collection of samples consists of sheep and rabbit pellets, black buckshot gravel, lydian-stone, resin balls from burnt "black-boys" and pieces of battery cases.



ROYAL PATRON

His Royal Highness the Duke of Edinburgh has accepted the invitation of the Ian Clunies Ross Memorial Foundation to become its Patron.

The Foundation was established in 1959 as a non-profit organization to honour the memory of the former Chairman of CSIRO Sir Ian Clunies Ross.

The first project of the Foundation is to build a National Science Centre in Melbourne. A site at Parkville has been purchased and architects engaged.

The Memorial Foundation plans to work in all States and negotiations are proceeding for the opening of an office in Brisbane.

£250,000

The Directors of CSIRO Co-operative Credit Society report that investments now total a quarter of a million pounds.

Achieved in the space of six years, this reflects the confidence investors have in the Society.

Investors have enjoyed a safe and profitable outlet for their funds, and borrowers have a simple and cheap method of financing their needs.

Membership of the Society is open to all employees of CSIRO, and new appointees are reminded of this source of finance. Further investments in the Society from employees or close relatives of employees is also welcome.

APPOINTMENTS VACANT

The following vacancies for professional appointments are current—

EXPERIMENTAL OFFICER (E.O.1/2)—Division of Textile Industry, 464/328 (10/4/64).

RESEARCH OFFICER (R.O./S.R.O.)—Division of Plant Industry (chemist), 130/629 (10/4/64).

EXPERIMENTAL OFFICER (E.O.1/2)—Division of Animal Genetics (chemist), 675/132 (17/4/64).

EXPERIMENTAL OFFICER (E.O.2/3)—Division of Radiophysics, 780/349 (17/4/64).

RESEARCH OFFICER (R.O./S.R.O.)—Division of Fisheries and Oceanography (physical chemist), 320/293 (17/4/64).

RESEARCH OFFICER (R.O./S.R.O.)—Division of Land Research and Regional Survey, Canberra (soil scientist), 618/150 (17/4/64).

EXPERIMENTAL OFFICER (E.O.1/2)—Division of Applied Mineralogy, 604/28 (24/4/64).

RESEARCH OFFICER (R.O./S.R.O.)—Division of Mineral Chemistry, 601/25 (24/4/64).

TECHNICAL ASSOCIATION NEWS

The General Secretary has returned from initial discussions at Head Office concerning a salary rise for Technical grades in CSIRO. Until a firm offer, approved by the Public Service Board, has been made to our Association, actual items and details discussed will remain confidential with Central Council. It is hoped that details of any offer made by CSIRO will be brought to the notice of members either by the "Gazette" or another bulletin.

Every effort is being made to ensure that Branch Chairmen will be in a position to vote on acceptance or otherwise of any offer made at our next Council-in-Person meeting. It is hoped that this meeting will be held on 25 and 26 April, followed by a meeting at Head Office with the Secretariat on 27 April.

As a result of increased publicity, the General Secretary has received a number of enquiries concerning membership. These have been referred to the appropriate Branches for immediate action. The activities of Branch committees, Council, and Secretaries can now do a great deal to influence the increase in membership.

Council at the moment is investigating the possibility of a large-scale arrangement with an insurance company to cover Association members, for the difference between Workers' Compensation payments and actual salary. Further details should be available for the April meeting of Council in Melbourne.

Overseas Visits

Dr. N. K. Boardman of the Division of Plant Industry is paying an eleven month visit to the University of California and left Australia in March. He will attend the Sixth International Congress of Biochemistry, New York, in July. Dr. Boardman will return home via Japan.

Dr. R. J. Bray of the Division of Physics has left Australia for a nine month visit to Europe, the United Kingdom and Northern America. He will spend from February to September working at the Fraunhofer Institute, Freiburg, Germany. Dr. Bray is interested in the fine structure of the chromosome and will attend the meeting of the International Astronomical Union in Hamburg in August.

Mr. P. E. Ciddor of the Division of Applied Physics left Australia in January on an official visit to Canada, U.S.A., U.K., Europe and Japan. He will be absent from Australia for five to six months and the main purpose of his visit is to spend approximately three months with the National Research Council of Canada studying the application of interferometry to length measurement.

Mr. R. V. Dunkle of the Division of Mechanical Engineering spent two weeks in North America last month at the Symposium on the Thermal Radiation of Soils held at San Francisco. This symposium was sponsored by the National Board of Standards and N.A.S.A.

Dr. N. McC. Graham of the Division of Animal Physiology left Australia in March to visit New Zealand, U.S.A., Canada, U.K., East Germany, Israel and Africa. He is chiefly interested in the bioenergetics of domestic animals and will attend the International Symposium on Energy Metabolism of Farm Animals to be held in Scotland in May.

Mr. G. B. Gresford, the Organization's Secretary, left Australia in February to attend the New York meeting of the United Nations Advisory Committee on the Application of Science and Technology to Development. Mr. Gresford acted as advisor to Sir Ronald Walker, the Australian dele-

gate. He returned to Australia via London.

Dr. G. W. Hill of the Division of Mathematical Statistics left Australia in January to spend six months at Stanford University working on asymptotic expansions of statistical distributions. He will also carry out factory inspection testing of electronic equipment for the Computing Research Section.

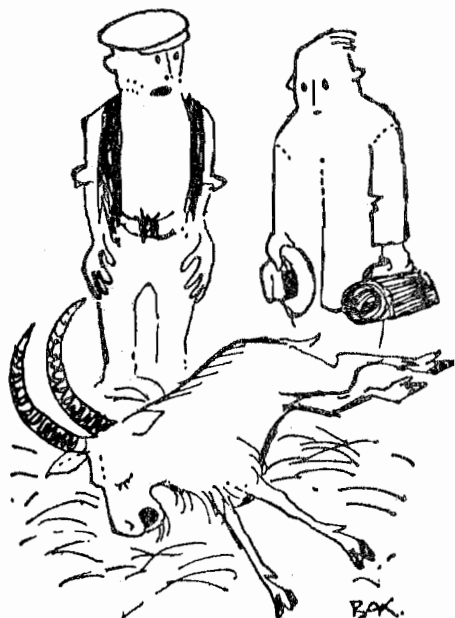
Dr. H. R. Marston, Chief of the Division of Biochemistry and General Nutrition left Australia last February to visit the United Kingdom and U.S.A. Dr. Marston's visit to the United Kingdom was at the invitation of the Royal Society to deliver a series of lectures. He also took the opportunity to visit research groups at Oxford, Cambridge and London.

Dr. F. H. W. Morley, Assistant Chief, Division of Plant Industry paid a one month visit to the U.S.A. in February and attended the Assilomar Conference on the Genetics of Colonizing Species. Dr. Morley also visited the University of California to participate in seminars.

Mr. J. P. Penny of the Computing Research Section is visiting the U.S.A. to discuss problems in the installation and operation of Control Data computing equipment, particularly in reference to acceptance tests. He will attend the 1964 Joint Computer Conference, Washington, D.C., in April before returning to Australia.

Mr. R. H. Sedgley of the Riverina Laboratory, Deniliquin, has been granted an overseas traineeship in Physical Agronomy and is spending twelve months at the University of Illinois. He will gain further knowledge of soil plant systems working in the Agronomy Department under Professor W. B. Russell.

Mr. H. R. Skewes of the Division of Mineral Chemistry left Australia in March to visit the U.K., France, West Germany, Holland, Switzerland, Italy, Sweden, Norway, U.S.A. and Japan. He will be absent for eight months. At the National Chemical Laboratory, London, Mr. Skewes will work on ion exchange membranes with Mr. D. K. Hale.



"He ate my copy of Silent Spring."

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Arts Group

The staff of the Division of Protein Chemistry have formed an Arts Group to buy works of art.

Paintings are borrowed from various Melbourne galleries and put on display at the Division for potential buyers.

Mr. Eric Westbrook, Director of the National Gallery of Melbourne, has welcomed the formation of the Art Group and has offered to advise on the acquisition of paintings.

All past or present members of CSIRO are eligible for honorary membership of the group.

Those interested should contact the Secretary, Dr. S. J. Leach at the Division of Protein Chemistry.

An impressionistic painting currently on exhibition at the Division of Protein Chemistry is entitled "The Levant Mine". This was painted by English artist John Tunnard, and was loaned to the Arts Group by Mr. Westbrook.

The Group's future plans include visits to galleries and lectures by visiting experts.

BLACK DIAMONDS

Astrakhan pelts are obtained from Karakul lambs and because of the high price they fetch—£4 to £5 each—the pelts are known in the trade as Black Diamonds.

The Karakul is a fat-tailed sheep, and each year the adults grow three to four pounds of wool which is used in carpet making.

Miss Helen Newton Turner of the Division of Animal Genetics recently visited South Africa to investigate the breeding of Karakul sheep. This article is condensed from an A.B.C. radio talk she gave in the Countryman's Session.

The lambs, born with shiny, hairy pelts which are usually black, are slaughtered when one day old to yield astrakhan.

Karakul sheep are raised in U.S.S.R. and South Africa and thrive in areas of low rainfall.

The famous Cossack-type hats are often made from Karakul pelts, also the heavy

Below—Karakul sheep raised on a stud farm in South Africa.

outer coats required in the hard Russian winters.

The Karakul industry in South Africa is concentrated in the north western region near Upington on the Orange River and also in the Kalahari desert.

Stud farms are located in the eight to ten inch rainfall area near Upington and on these farms a spineless cactus is used as a fodder crop.

This cactus looks like a small prickly pear plant without the prickles.

It provides both food and water and the cacti are planted in rows like any other fodder crop.

Stud owners claim lamb production rates as high as ninety per cent.

The Kalahari desert area is used only for commercial breeding farms, and watering of stock is a big problem as the annual rainfall is only five inches.

Dry clay pans are used as catchment areas and the rain water drains into underground earth tanks.

The water is pumped from these by windmills.

In the U.S.S.R. the lamb crop is augmented by using hormones to increase the number of eggs released from the ewe's ovary before mating.

Another line of approach has been to cross the Karakul with a highly fertile breed, the Romanov, which has been known to record as many as nine lambs per birth.

The Romanov breed has a lambing average of two hundred per cent.

Crossbreds have a lambing percentage higher than pure Karakuls and selection processes applied to the hybrid have aimed at the production of high quality pelts.



Soft Rot in Towers

Water-cooling towers are a common feature of most industrial landscapes, and large ones are located at electric power stations, oil refineries, factories, gas plants and even hospitals.

Because of the high frequency of soft rot of their internal wooden structures, water-cooling towers have been of some interest to the Division of Forest Products over the past ten years.

The towers are used for cooling recirculated water by evaporation and commonly contain horizontal layers made up of wooden trays of spaced parallel slats.

The function of the wooden slats is to provide a large surface area for the evaporation of the water percolating down the tower and to delay its descent.

Air is pushed or sucked up the tower by fans and the circulating water is cooled by evaporation.

Wood is used almost exclusively for cooling tower slats because of its stiffness in relation to weight, ease of machining, freedom from corrosion, and low cost. Its chief disadvantage is its liability to fungal attack.

After three to ten years of service, a tower will often develop symptoms of soft rot in its slats.

Soft rot was practically unknown in water cooling towers fifteen to twenty years ago.

Its increase in recent years is apparently due to the greater use of high-efficiency mechanical-draught towers.

The Division of Forest Products has thirty cooling towers throughout the Commonwealth under observation.

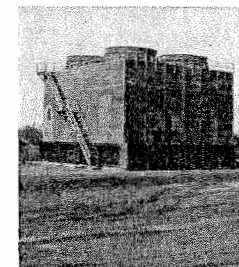
Repeated observations are made on the pH, chemical content, and temperature of the circulating water in each tower.

When sufficient information is available, an attempt will be

made to define the conditions under which soft rot is most likely to develop.

One of the modern trends in tower construction is to use wooden slats impregnated with preservatives such as copper-chrome-arsenate.

The preservative technique adopted by the Division of Forest Products and used commercially is to stack the slats in a cylinder, and impose a vacuum to remove air from within the wood.



One of the cooling towers at the Liverpool Power Station, New South Wales. This tower was prefabricated in California redwood.

The slats are then treated with copper-chrome-arsenate solution at room temperature and at a pressure of two hundred pounds per square inch for 15 minutes.

Preservative-treated wooden slats are more durable than even the best untreated timbers and are expected to have a useful life in cooling towers of at least 25 years.

VISITORS

Professor L. G. Hepler of the Carnegie Institute of Technology is spending six months at the Division of Physical Chemistry working on the thermodynamics of electrolyte solutions at high pressures.

Professor S. Husain, Department of Mechanical Engineering, West Pakistan University, has been awarded a United Nations Fellowship to study utilization of solar energy. He will arrive in Australia this month and will make the Division of Mechanical Engineering his headquarters for the next two years.

Mr. S. Kawanabe of the National Institute of Animal Industry, Japan, is spending twelve months at the Division of Plant Industry, Canberra, and the Division of Tropical Pastures, Brisbane. His particular interest is in plant ecology.

Dr. H. Tabor, Director of the National Physical Laboratory, Israel, visited the Division of Mechanical Engineering during March. He participated in a seminar on the utilization of solar energy.

Obituary

Mr. H. Surkevicius of the Division of Building Research died suddenly on 22nd February. He was a native of Lithuania and had been with the Division since 1959, where he worked on the calcination and setting of gypsum, and the application of atomic absorption spectroscopy to gypsum analysis.

APPOINTMENTS TO STAFF

Mr. G. M. Abbott has been appointed to the Division of Textile Industry. He will assist in chemical investigations related to woollen textile processing. Mr. Abbott graduated B.Sc.(Hons.) from the University of New South Wales in 1964 and last year undertook a short period of industrial training at woollen mills in Tasmania.

Dr. R. W. Armstrong has been appointed to a Fellowship in the Division of Tribophysics and will conduct research in metal physics. An American citizen, Dr. Armstrong graduated B.Mech.Eng. from John Hopkins University in 1955 and Ph.D. from Carnegie Institute of Technology in 1958.



Dr. R. W. ARMSTRONG

Mrs. B. Bergmanis has joined the Translation Section and will be responsible for translating scientific and technical material from Russian and German. Mrs. Bergmanis was previously employed by the Peter MacCallum Clinic, Melbourne, and graduated B.A. from the University of Melbourne in 1963.



Mrs. B. BERGMANIS

Mr. G. F. Byrne has been appointed to the Division of Land Research and Regional Survey, Canberra to assist in the research work of the climatology group. Mr. Byrne graduated B.Sc. from the University of Melbourne in 1952 and was formerly employed by Kodak as a physicist.



Mr. G. F. BYRNE

Mr. G. R. Chaplin has joined the Division of Land Research and Regional Survey and is stationed at the Coastal Plains Research Station, Darwin. He will assist in investigations in the variation of fertility of soils and the nitrogen cycle

under paddy rice growing conditions. Mr. Chaplin recently graduated B.Sc.Agr. from the University of Sydney.



Mr. G. R. CHAPLIN

Mr. A. G. Doery has been appointed to the Secretariat (Agricultural Liaison) and will be responsible for the organization of conferences approved by the Australian Agricultural Council. Mr. Doery graduated B.Agr.Sc. from the University of Melbourne in 1935, and was formerly Officer-in-Charge of the Ellinbank Dairy Research Station, Warragul.



Mr. A. G. DOERY

Mrs. P. S. Elmes, an M.Sc. graduate from Canterbury University, New Zealand, has joined the Division of Organic Chemistry. She will assist in research on co-ordinate mercaptides and azido compounds and the implications of these for the wool research programme of the Division of Protein Chemistry.



Mrs. P. S. ELMES

Mr. R. R. Cattley, a M.Sc. graduate from the University of New Brunswick, Canada, has been appointed to the Division of Entomology, Sydney University. He will assist in the fruit-fly ecology programme and will study the behaviour of the male fruit-fly in response to a powerful lure. Mr. Cattley was formerly a post-graduate student at Sydney University.

Miss H. M. McFarlane has joined the Division of Animal Genetics to assist in the research programme on the cell regulatory system in parametria. Miss McFarlane graduated B.Sc.(Hons.) from the University of Sydney this year.

Mr. S. L. Jones has been appointed to the Division of Plant Industry to assist in research on plant nutrient transformations. Mr. Jones graduated B.Sc.(Agric.) from the University of Western Australia in 1964.

Miss E. M. Hoare has been appointed to the Division of Plant Industry to assist in laboratory and statistical work concerned with the genetics and physiology of flower morphogenesis in wheat. Miss Hoare graduated B.Sc.(Hons.) from the University of Sydney, 1963.



Miss E. M. HOARE

Dr. R. W. L. Kimber has been appointed to Division of Soils to isolate and identify toxic substances resulting from the decomposition of wheat straw. This research is being financed from the Commonwealth Wheat Research Fund. Dr. Kimber graduated B.Sc. (Hons.) from the University of Adelaide in 1956 and Ph.D. in 1959.



Dr. R. W. L. KIMBER

Mr. R. K. Jones, a graduate in Agricultural Science from the University of Melbourne, has joined the Division of Tropical Pastures, Townsville. He will conduct research on the nutrition of pasture plants grown in a range of tropical environments.

Mr. R. H. Hudson, an American citizen, has joined the Computing Research Section, to assist in the establishment and operation of the Organization's computer network. Mr. Hudson graduated B.Sc. from the University of Boulder, Colorado, in 1955 and obtained his M.S. from Stanford University, California, in 1957.

Mr. D. R. Ross has been appointed to the Computing Research Section, Adelaide, to assist in the establishment and



Mr. D. R. ROSS

operation of the Organization's computer network. Mr. Ross graduated B.Sc.(Hons.) from the University of Queensland in 1961.

Musca Post Mortem

Officers of the Division of Food Preservation recently helped to solve a curious, but rare, problem in the food industry and also demonstrated the practical value of a knowledge of enzyme systems in food products and organic tissues.

The problem was to find if a dead fly found in a can of meat and gravy was in the can when it was sealed at the cannery, or whether the fly had entered after the can had been opened by the customer—as seemed more likely.

In tackling this problem two known facts were considered.

Firstly, the organs of many insects contain enzymes known as phosphatases.

Secondly, these enzymes persist in dead insects for considerable periods of time, if not destroyed by heat.

It was reasoned, therefore, that if active phosphatase were found in the fly, the latter was likely to have entered the can after it was opened; otherwise the enzyme would have been inactivated during the retorting of the sealed can.

It was necessary, however, to establish that the analytical technique to be used was sufficiently sensitive to detect the small amount of enzyme present in a single fly.

Phosphatases liberate inorganic phosphate from certain compounds such as sodium beta-glycerophosphate, and this reaction was made the basis for a delicate test, the liberated phosphate being detected by colorimetric means.

It was possible to detect quite easily the phosphatase present in only half of a fly by the intense blue coloration developed in the test solution.

When the other half of the same fly was processed in a can of meat gravy for thirty minutes at 240°F only a faint blue colour was observed in the test.

A similar result was obtained with another specimen in a can of gravy sterilized in the atmospheric spin cooker for two minutes and spin cooled, the unprocessed half giving a strong positive phosphatase reaction, as before.

The fly in question gave only a faint blue coloration when it was tested directly for phosphatase, thus providing strong presumptive evidence that it had been through the retorting process at the cannery, and had not entered the can at a later stage.

The possibility that it had drowned in the hot gravy of the open can after this had been heated by the customer was excluded by comparative tests which demonstrated conclusively that the can had not been in hot water after labelling; also by the fact that a fly drowned in this way gave a more intense reaction to the test for phosphatase.

Mr. R. K. Mann has joined the Division of Textile Physics, where he will assist in the study of the physical properties of woven and knitted cloth. Mr. Mann graduated B.Sc. from the University of New South Wales this year, having studied in the School of Textile Technology.

Mr. I. C. Smith, who recently joined the Editorial and Publications Section, graduated B.Sc.(Hons.) from the University of Reading in 1945 and has held research and teaching appointments at the Universities of St. Andrews and Glasgow. Mr. Smith will be responsible for editorial work on biological journals.



Mr. I. C. SMITH

Mr. R. N. Sanders has joined the Division of Animal Health, Parkville, where he will act as Scientific Assistant to the Chief. Mr. Sanders graduated B.V.Sc. 1936 from the University of Sydney and was formerly Director of Veterinary Services and Animal Industry in the Department of Veterinary Services, Uganda, East Africa.

Miss J. J. Stuckey, a recent B.Sc. graduate from the University of Sydney, has joined the Division of Animal Genetics, where she will assist in studies on molecular mechanisms of mutation and cell ultrastructure.

Mr. A. Takken has been appointed to the Division of Animal Physiology, Brisbane, to assist with the study of the

effect of nutrition on cattle reproduction and the hormonal synchronization of ovarian cycles for artificial insemination. Mr. Takken graduated B.V.Sc.(Hons.) from the University of Sydney, 1962.

Mr. J. C. O'Kelly has been appointed to the Division of Animal Genetics and is stationed at the Cattle Research Laboratory, Rockhampton. He will assist in a research programme on the physiology of cattle. Mr. O'Kelly graduated B.Sc. from the University of London in 1958 and in 1962 obtained the Diploma in Biochemistry from the Chelsea College of Science.

Dr. K. R. Weller has joined the Division of Chemical Engineering where he will be concerned with theoretical work covering fluid dynamics, mass transfer, reactor design and process dynamics. Dr. Weller graduated B.E. 1959 and Ph.D. 1963 from the University of Adelaide.

Mr. J. R. M. Wolfe has joined the Division of Land Research and Regional Survey to act as Scientific Assistant to the Chief. Mr. Wolfe graduated B.Sc.(Agric.) from the University of Western Australia in 1951 and obtained his M.S. degree at Cornell University in 1958. He was formerly Extension Training and Research Officer in the Department of Primary Industries, Queensland.



Mr. J. R. M. WOLFE

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Printed by CSIRO, Melbourne

C O R E S E A R C H

FOR CIRCULATION AMONG MEMBERS OF CSIRO STAFF — NUMBER 62, MELBOURNE, MAY 1964

NEW ADELAIDE LABORATORY

A new laboratory for the Horticultural Research Section was opened in Adelaide recently by Dr. J. Melville, Director of the Waite Agricultural Research Institute.

The two-storey building erected at a cost of £34,000 on a site adjacent to the Division of Soils, will form the headquarters of the Section.

Research workers in plant nutrition, biochemistry, and nematology will be housed in the new laboratory.

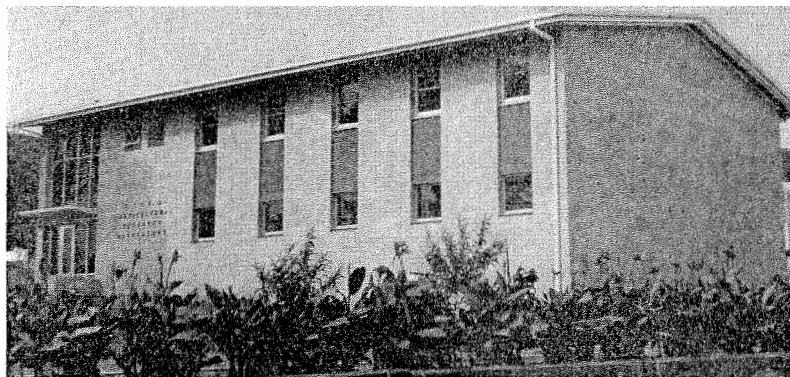
The Section will also conduct studies in controlled environment at the nearby Wine Research Institute.

should reveal the effects of light and temperature on fruit development.

Other work would include hormone studies on the crop-limiting process of fruit set, biochemical studies on the mechanism controlling sugar accumulation in fruit, and

been made on the selection, introduction and breeding of woody perennials specifically adapted to Australian conditions.

Work at Merbein on vine and tree improvement, fruit biochemistry, nematology and nutrition will continue.



At the opening of the Laboratory Dr. Possingham, Officer-in-Charge of the Section, said that the Section's activities were confined to some of the more important woody perennial plants that produce edible fruit.

In particular, these were grape vines and the main tree crops commonly grown under irrigation such as apricots, peaches, and citrus fruits.

Dr. Possingham said that the environmental studies to be conducted by the Section

studies on nutrient uptake.

A considerable programme of nematological research would also be undertaken as nematodes are one of the biggest single limitations to horticultural crop production.

The activities of the Adelaide Laboratory will be closely integrated with those of the Section's research station at Merbein, near Mildura, Victoria.

Merbein will become the centre for the Section's field programmes, and a start had

HONOURS

Mr. A. C. Oertel, of the Division of Soils, has been admitted to the Degree of Doctor of Science by the University of Queensland. The degree was awarded for published work on the measurement and pedological interpretation of trace elements present in soils.

FOREST PRODUCTS FAVORS TIMBER

Work began recently on a unique two-storey laboratory and office building for the Division of Forest Products in South Melbourne. The new structure will be built almost entirely of timber but will have a concrete fire-proofed front to comply with a council ordinance.

Soil Stabilization

A colloquium on soil stabilization in engineering was held in Melbourne last month by the Soil Mechanics Section and was attended by more than seventy people from industrial firms, Government authorities, universities, and CSIRO.

Main emphasis was on the physical and chemical interactions which may occur between the soil and stabilizing additives.

Colloquium members discussed such questions as: How do cement and lime improve the strength and durability of a soft clayey soil?

Is it necessary to "water-proof" a soil to make it stable enough to use as a road pavement?

What chemical and physical processes are involved in the bonding together of clay crystals?

A thorough review of the present state of knowledge of soil stabilization processes showed that some aspects of the above questions remain unsolved.

Wool Men Meet

Research staff of the three Wool Research Laboratories met last month at Lorne, Victoria, to discuss each other's research programmes.

These meetings are held every eighteen months and on this occasion it was the Division of Textile Industry's turn to act as host to the Divisions of Protein Chemistry and Textile Physics.

This three-day conference covered a wide range of subjects from fibre physics and wool chemistry to mechanical processing and finishing.

The meeting concluded with a special dinner after which participants relaxed at a mock conference session.

An item which aroused a good deal of interest concerned high-density baling of wool.

Since high-density baling enables the same amount of wool to be packed into a smaller space, its adoption by the wool industry could mean considerable savings in shipping costs.

Freight charges on wool shipped from Australia total some thirty million pounds a year.

The Division of Textile Physics has been looking at high density packing to see whether compressed wool can be processed satisfactorily.

Current trials have shown no appreciable difference between wool packed in the normal way and wool pressed and banded to a density of 30 lbs. per cubic foot and then stored for six months.

The Division of Protein Chemistry has also been looking at high density packing and has been using vacuum-pressing to produce bales of wool with

densities roughly equal to those of dumped bales.

Bales compressed by the vacuum technique handle well because of their rectangular shape and buyers are satisfied that the bales "show and open up" well.

Aussie Rules

CSIRO Football Club, Melbourne, has again entered a team in the Sunday Social Football Competition.

The Club's immediate aim is to win the Sir Ian Clunies Ross Memorial Shield, at present held by the Taxation Club.

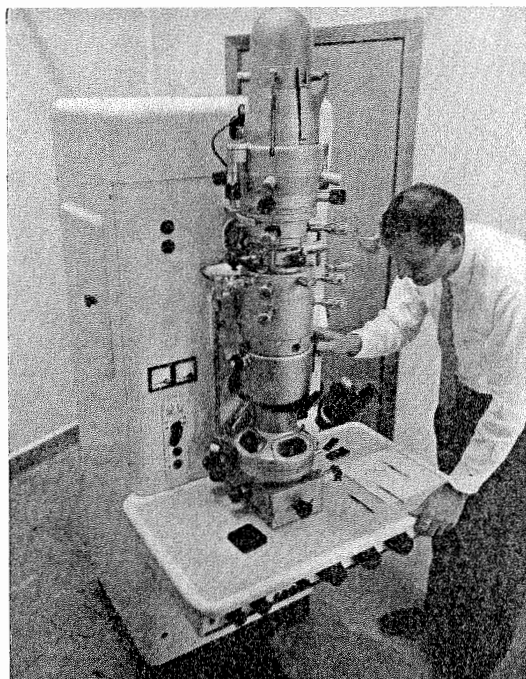
Alan Cross of Head Office was re-elected unopposed to serve his eighth consecutive term as President when the Club recently held its annual meeting.

New players are always needed and any Melbourne aspirants should contact Ted Parker at Head Office.

Commuters

A new school to be opened this month at Humpty Doo will eliminate one of the longest school bus routes in Australia.

In the past, children from the Coastal Plains Research Station, Humpty Doo rice farms, and the Beatrice Hill Research Station have had to travel ninety miles a day to attend school in Darwin.



This electron microscope was recently installed in Canberra and will be used by the Divisions of Plant Industry and Entomology. The instrument cost £16,000 and is capable of magnifications up to 250,000 diameters. It will play an important part in studies by the two Divisions on the relationship between cell structure and function, and in the identification of both plant and animal viruses.

Because of the ease of handling the materials and their cheapness, the cost of this building will be much less than that of a conventional building of similar size.

Mr. J. D. Boyd, Officer-in-Charge of the Timber Mechanics Section, said that, because of the poor foundations at the site—more than one hundred feet of silt, conventional construction would have been extremely costly.

A building of steel and concrete would have required deep and extensive piling or heavy concrete raft foundations.

The use of timber had made this unnecessary.

Although the building is restricted to two storeys it would have been possible to build five storeys in wood without putting down piles.

The main framework of the building is entirely of timber, including columns, main floor beams, floor joists, and flooring.

The columns are of laminated radiata pine, and the main beams have laminated mountain ash flanges with webs made from radiata pine plywood.

Wooden buildings are sometimes regarded as fire hazards but the real fire danger in any building lies not in the materials used in its construction but in its combustible contents.

Safety in large buildings can be ensured only through the provision of appropriate fire fighting equipment, proper design of exits, and the use of fire barriers.

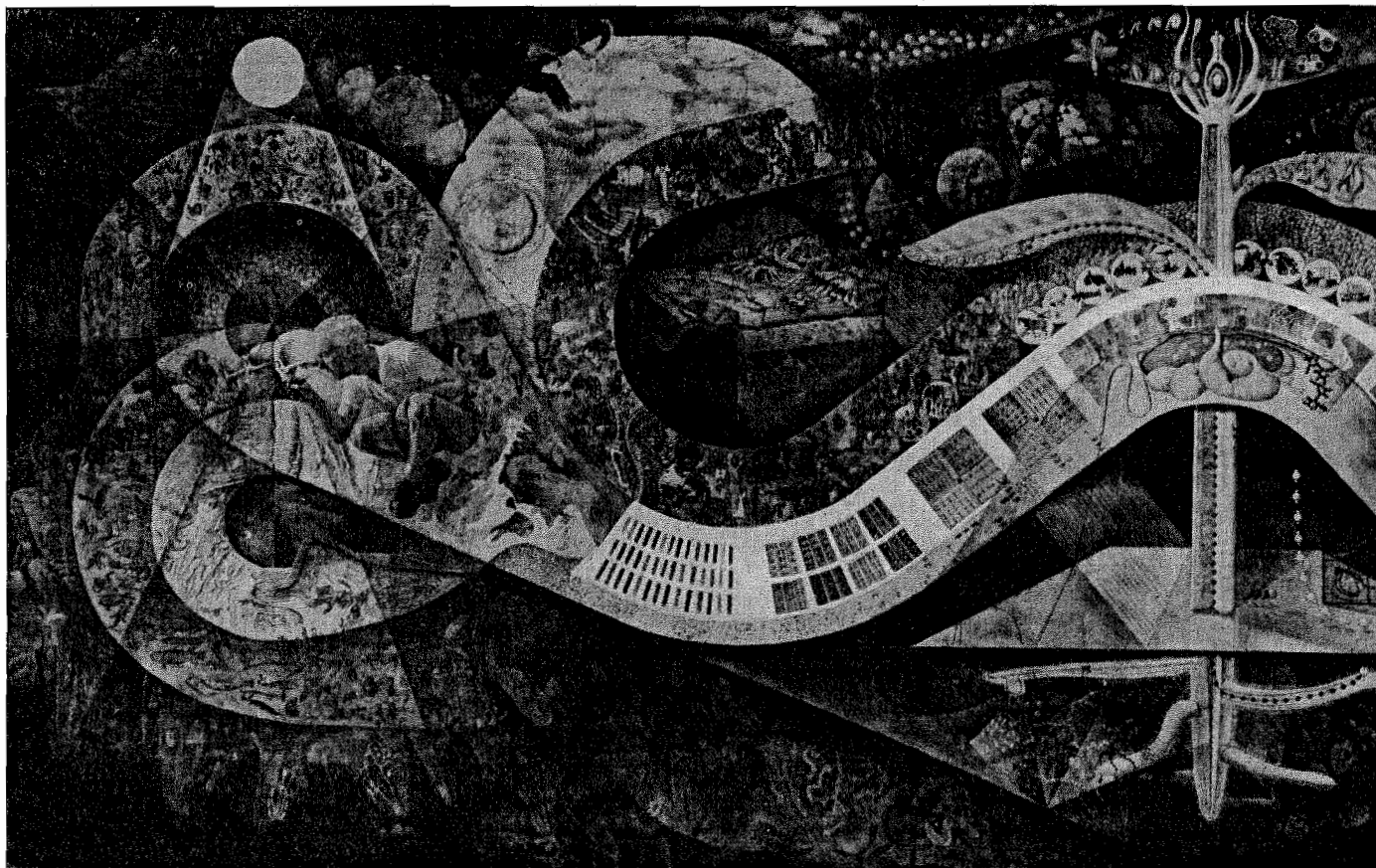
All the main structural members of the new building will have a one-hour fire rating.

APPOINTMENTS VACANT

The following vacancies for professional appointments are current:—

EXPERIMENTAL OFFICER (E01/2) — Division of Building Research. 390/322 (8 May)
RESEARCH OFFICER (RO/SRO) — Division of Animal Genetics. 675/134 (8 May)
RESEARCH OFFICER (RO/SRO) — Division of Animal Health. 201/189 (8 May)
RESEARCH OFFICER (RO/SRO) — Division of Plant Industry. 150/638 (8 May)
EXPERIMENTAL OFFICER (E01/2) — Division of Plant Industry. 130/639 (22 May).

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FRESCO PAINTED FOR LAND RESEARCH

A fresco painted on a wall in the entrance foyer of the Division of Land Research and Regional Survey's new building in Canberra has attracted wide attention and given rise to much comment.

Designed and executed by Mr. R. R. Ingpen, graphic designer of the Agricultural Liaison Unit, of Head Office, the fresco is in colour and twenty feet long and eight feet six inches high.

Supplementary flood lighting has been installed for night time viewing.

The original idea for the painting of the fresco came from Mr. A. F. Gurnett-Smith who at the time was Assistant to the

Chief of the Division of Land Research and Regional Survey.

The fresco illustrates the dynamic balance that Man must achieve with his environment and shows the procedures he adopts to observe, understand and modify his surround-

ings in his continual search for adequate food to satisfy his increasing demands.

The fresco technique, in which water-based paints are

must take into account when planning their activities.

Details of the design were worked out by Mr. Ingpen after weeks of discussion with Divisional officers.

Painting started in August, 1963, and was completed four months later.

Mr. Ingpen said that in designing the fresco he had to involve himself in four separate tasks which are common to the production of all applied art:

to fill the required space pleasantly.

• Having reconciled the conflicting claims of these three sets of inventions, he had to translate them into pigment applied to a flat surface.

Figure 1 depicts the balance that Man must achieve in his environment.

Mass A is Man's natural surroundings, mass B is the environment he fashions for himself.

The details contained in C illustrate the procedures by which Man modifies his surroundings to produce adequate food.

The vertical mass D is the fulcrum of this balance; in the fresco it is represented by a plant, as plants play a dominant role in Man's efforts to balance his environment.

The physical and biological environment is shown in Figure 2.

A is the climate, B is the structure and formation of land, C is the soil, D and E the plant and animal kingdoms respectively, and F represents natural dispersal of plant and animal species.

These major elements of Man's surroundings are observed and recorded by officers of the Division of Land Research and Regional Survey as a basis for the planned utilization of the environment.

G represents Man facing his environment to observe and record its natural resources.

H displays the changes in the proportion of food producers and consumers during the development of human society.

The stages in the investigation and development of land productivity are shown in I, while J symbolizes the resultant agricultural complex of plant, animal, farm, farm mechanization, and consumers.

Problems invariably arise in the development of the agricultural potential of a region, and these require basic observations to be made in areas such as the study of plant environments.

TECHNICAL ASSOCIATION NEWS

Branches and Central Council will hold their elections in the near future to determine who will administer the Association through the new year of 1964-65. In all, there are twenty-two positions for Officers of the Association to be decided by elections. These are the Chairman, Secretary and Treasurer in each Branch, totalling eighteen positions; also the Federal President, General Secretary, General Treasurer and Publicity Officer on Central Council. Unfortunately there are often too few nominations, so that a position is filled by one person from year to year.

The results of the elections are declared at the respective Annual General Meetings where the large attendance matches the enthusiasm of the new committee. The various committees can be positive in their thinking and actions if they know that they have the support of their members.

Co-operation of members with their Divisional delegates is essential for a strong active Divisional group. To the proxies on Council who act on behalf of interstate chairmen, much responsibility is delegated and carried out in a very effective manner.

This year, as in others, a Council-in-Person meeting will be held prior to Annual meetings. In this case it will be on 2 and 3 May, followed by a meeting with the Secretariat and Executive members on 4 May. This will enable the Branch Chairmen to present to their members a full report of the items discussed at both meetings.

It is hoped that by the time of publication of this article all members will have received their copies of the "Gazette", and be fully aware of the possible implementation of a new salary scale. Once again it is expected that at the various Annual General Meetings details can be given of negotiations brought to a successful conclusion.

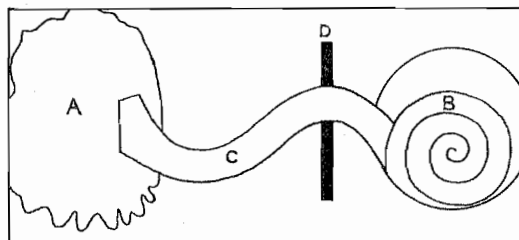


Figure 1

applied to a fresh lime-plastered surface is very old, the first known use being some 2,500 years ago in Egypt.

The technique was in constant use until the seventeenth century, when it lapsed.

It has been revived in the last few years in an attempt to

• He had to invent a set of shapes and colours which would express as symbols his feelings about the theme.

• He had to invent a second set of shapes and colours which would need to remind the spectator of the position

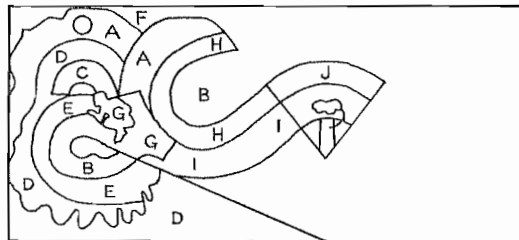


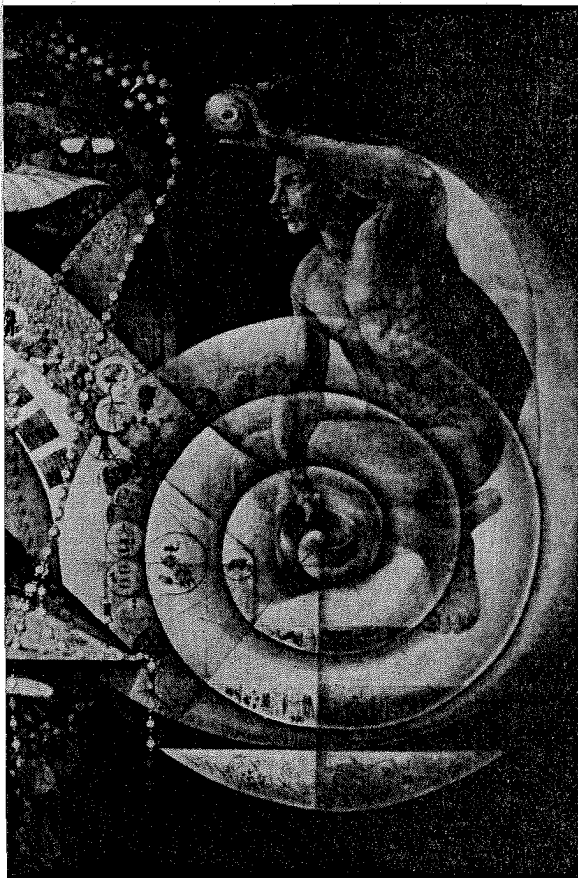
Figure 2

suit the needs of modern architecture.

The fresco is in almost daily use to explain to visitors the aims of the Division and the factors that its research workers

of Man in his surrounding world and how he uses this world to produce his essential requirements.

• These sets of shapes and colours had to be arranged



ARCH DIVISION

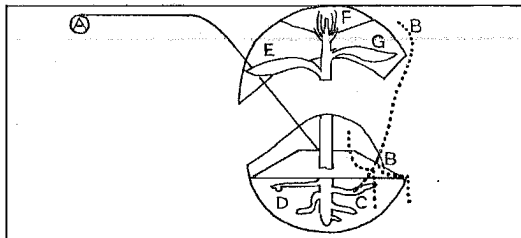


Figure 3

Figure 3 represents a typical plant environment.

A is the energy from the sun and B the water balance struck between evaporation, plant uptake, leaching and run-off.

C and D are, respectively, the inorganic and organic soils, both containing nutrients essential to the plant.

E represents photosynthesis and the production of plant

centre of his environment, against his efforts to control his own population in his left hand.

The left hand holds a human ovum which it shelters from a sperm.

B represents Man's food requirements, and is a pyramid of mass and energy.

C is his technical ability and D his growing knowledge of

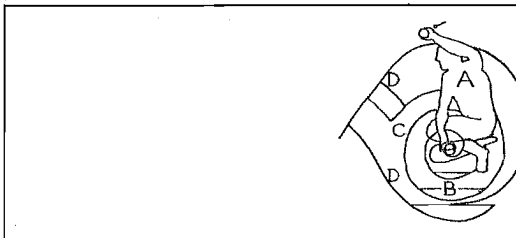


Figure 4

material, F is plant reproduction and development, and G plant predators and their control.

Figure 4 is the mass on the right side of the fresco, and depicts the human environment.

This is the more complex environment where Man is able to consciously modify his surroundings through his awareness of the following:

A, representing the balance between supply and demand. Man balances the food bowl in his right hand, which is at the

the means to conserve resources.

Mr. Ingpen pointed out that the fresco is meant to be closely observed, to seek relationships between heterogeneous elements.

In this way the spectator copies the scientists, for whom observation occupies a key part in the scientific process.

Observation of the fresco will, however, bring people to their own conclusions concerning the relative importance of the various detailed areas.

Si-Ro-Set

The Australian Wool Board has published a leaflet listing Si-Ro-Set processors in each State who are willing to take single garments for treatment. The Wool Board's leaflet states that the Si-Ro-Set process is restricted to new garments.

Si-Ro-Set processors in Australia are at present treating about one million garments a year and the process has been adapted for uniforms by most government departments.

It is also being used extensively overseas.

Creases or pleats made by the Si-Ro-Set process are unaffected by rain, hose-spray or even prolonged immersion in water.

They are also unaffected by dry cleaning and normal wear.

The process is usually restricted to new garments, as stains can develop if used garments are treated.

This staining is due largely to the reaction between the chemicals used and traces of metal picked up in wear and during dry cleaning.

Light-coloured garments are most likely to be affected.

In spite of the possibility of staining, most Si-Ro-Set processors are willing to accept used garments at owner's risk. For dark-coloured garments this risk is quite small.

The leaflet is available from the Australian Wool Board offices in Sydney and Melbourne.

VERY DEEP FREEZE

The first liquid nitrogen food freezing plant to reach Australia was recently imported by a commercial firm, and the Division of Food Preservation provided space and facilities at North Ryde to demonstrate the machine's potentialities to industry.

In recent years large quantities of nitrogen have become available in the United States as a by-product from the isolation of oxygen for rocket fuel.

One potential outlet for this was its use in liquid form as a refrigerant.

For this it has many attractive properties; it has a boiling

point of minus 320°F., it is colourless, odourless, and non-toxic, and is chemically inert.

For freezing food, it can be used either for direct immersion or for spraying of unpacked products, and it provides very high freezing rates.

The vital question of cost now appears to have been satisfactorily solved in the United States.

Liquid nitrogen refrigeration is competitive with mechanical refrigeration provided effective use is made of the residual refrigeration capacity of the low-temperature effluent gas emerging from the freezer.

This may be achieved by using the gas to pre-cool food, or to refrigerate storage rooms.

Provided that the scale and continuity of operations are suitable, it is economically worthwhile to use equipment to re-liquify the cold effluent gas, thus providing a closed thermal system.

The machine temporarily located in the Division's food processing area at North Ryde has a capacity of between 1-1½ tons per hour, and has caused widespread interest.

Mr. H. McIntosh a Canadian deep-freeze expert, demonstrated the capabilities of the machine but encountered trouble with bananas, which could be frozen in the normal way, but would not return to their normal state when defrosted.

Instead, they turned to a mushy black mess.

Mr. McIntosh recounted his technique for freezing live goldfish.

"I lifted a live goldfish from its bowl and carefully tied a piece of string to its tail.

"Then I lowered the fish into liquid nitrogen, taking care to avoid damage to its delicate fins.

"The fish immediately froze at minus 320 degrees Fahrenheit.

"I then returned the fish to its bowl where it quickly returned to normal and swam around."

He explained that the fast freeze locked oxygen inside the goldfish, thus enabling it to be restored to life.

Mr. McIntosh added that the technique will not work on humans.

EUCALYPTS

Dr. Nancy T. Burbidge, of the Division of Plant Industry, has written and published a guide to the eucalypts of the Australian Capital Territory.

The book contains a key to the identification of the Territory's eucalypts based on examination of leaves, buds, capsules and bark.

There are notes on each kind of tree and an indication of where each may be found.

Photographs are by Mr. C. Totterdell of the Division of Plant Industry.

"The Gum Trees of the Australian Capital Territory", by Nancy T. Burbidge, with photographs by Colin Totterdell, published by the authors, 12/-.

Overseas Visits

Dr. J. E. Falk, Chief of the Division of Plant Industry, is visiting centres of plant and agricultural research in Europe and Asia. Dr. Falk will lecture in Switzerland, the U.K., and Japan on the formation, fate and function of porphyrins in plants.

Mr. J. W. Holmes, of the Division of Soils, is making an overseas visit to centres con-

cerned with research on soil moisture. He will also spend some time at the Institute of Nuclear Science, D.S.I.R., New Zealand and at the Argonne National Laboratory, U.S.A., evaluating progress made on the use of tritium for dating and tracing water.

Mr. K. Myers, of the Division of Wildlife Research, is making a five-month visit to New Zealand, U.S.A., U.K., Sweden, Finland, France, Spain, India and Malaysia where he will survey research on rabbits and other small mammals.

Mr. M. M. H. Wallace, of the Division of Entomology, left Australia in April to spend twelve months in North America and Europe. He will evaluate European research work on the bedbug mite, a predator of the lucerne flea. Mr. Wallace will attend the Twelfth International Congress of Entomology in London next July.

In the Swim

A team from Head Office defeated the Division of Building Research by only three points in a recent swimming contest held by the Melbourne Divisions.

Forest Products took third place.

As in previous years, the programme was liberally sprinkled with novelty events to keep the accent on an evening's fun rather than on fiercely organized competition.

In the men's obstacle race twenty-four swimmers discovered that there are easier things to do in a lab coat than swim thirty-three yards.

Air Race

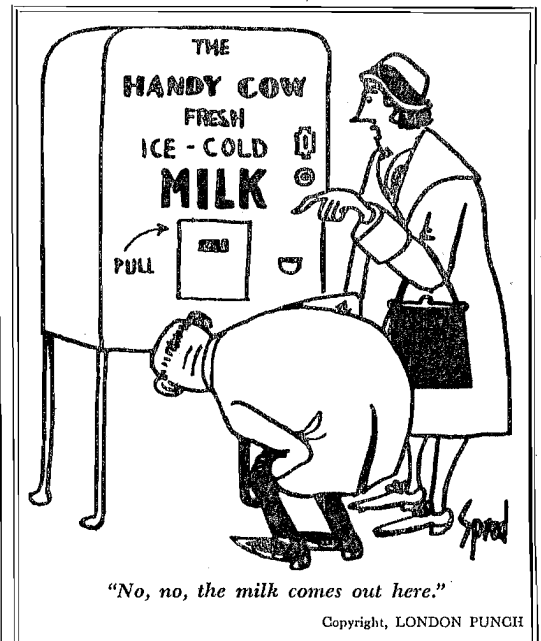
Grahame Brett, of the Pastoral Research Laboratory, Armidale, was a contestant in the Ansett Air Race from Brisbane to Adelaide held over Easter. Accompanied by a navigator, Grahame flew Vica Airtourer 100 VH-TWC.

Of the 146 participants there were only five who, for minor technical reasons, did not complete the 1,400-mile course.

Grahame and his navigator left Armidale on Friday, 27 March, in conditions which were far from good.

Three days later they flew over the Parafield tower, Adelaide, having covered 1,482 statute miles without mishap or trouble.

Grahame and his companion took eighty-ninth place in the race. This placing was based on total race time after the application of handicaps.



"No, no, the milk comes out here."

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APPOINTMENTS TO STAFF

Miss J. D. Allsopp has joined the Division of Applied Mineralogy where she will assist in the development and application of physical and chemical analytical techniques. Miss Allsopp obtained the Associate Diploma of Applied Chemistry from the Royal Melbourne Institute of Technology in 1963 and was previously with the Division of Organic Chemistry.

Mr. J. L. Bannister has been appointed to the Division of Fisheries and Oceanography, Perth, where he will study the structure and dynamics of sperm whale populations. Mr. Bannister graduated B.A.(Hons.)



Mr. J. L. BANNISTER

from the University of Oxford in 1960 and spent six months as a whaling inspector at South Georgia, U.S.A., before joining the National Institute of Oceanography, Surrey, United Kingdom.

Miss M. D. Barrow has been appointed to the Division of Plant Industry to make an ecological study in South Eastern Australia with special reference to the history and



Miss M. D. BARROW

evolution of existing plant communities and soils. Miss Barrow graduated B.Sc.(Hons.) from the University of Leeds in 1954 and obtained her Dip.Ed.(London) in 1955. She was formerly biology mistress at Melbourne Church of England Girls' Grammar School.

Dr. R. A. Bray, a Ph.D. graduate from the University of Wisconsin, U.S.A., has been appointed to the Division of Tropical Pastures where he will initiate breeding studies of lucerne and certain other legumes. Dr. Bray graduated B.Agr.Sc. from the University of Queensland in 1960 and was formerly a research assistant in the Department of Genetics, University of Wisconsin.

Mr. E. R. Cawthron has been appointed to the Division of Textile Physics to assist in research on heat and mass exchange in fibrous beds. Mr. Cawthron graduated B.Sc.(Hons.) from the University of Adelaide in 1963.

Miss G. M. Easton, formerly a Research Assistant in the School of Mathematics, University of New South Wales, has joined the Division of Radiophysics where she will

devise programmes for automatic computers used by the cloud physics group. Miss



Miss G. M. EASTON

Easton graduated B.Sc. from the University of New South Wales in 1962.

Mr. A. M. Evans has joined the Film Unit where he will be responsible for scripting, directing, taking, and editing films. Mr. Evans graduated B.Sc.Agr. from the University of Sydney in 1949 and was a Fulbright scholar at Iowa State College, U.S.A., in 1954. Mr. Evans has had wide experience in radio broadcasting, films, and television and was formerly a freelance writer, film director and broadcaster.

Miss J. M. Hinchy has been appointed to the Division of Food Preservation to study the biology of micro-organisms important in food spoilage and



Miss J. M. HINCHY

food poisoning. Miss Hinchy graduated B.Sc. from the University of Sydney in 1960 and was formerly a biochemist at the School of Public Health and Tropical Medicine, Sydney.

Dr. P. Humble has joined the division of Tribophysics where he will study the properties of crystal defects in



Dr. P. HUMBLE

metals. Dr. Humble is a recent Ph.D. graduate from the University of Bristol.

Mr. S. W. Ihle has joined the Division of Mineral Chemistry where he will assist with the design and operation of high-temperature vacuum equipment and develop techniques for handling metal halides in solid, liquid and vapour states. Mr. Ihle gradu-

ated Dip.Ing. from the University of Technology, Danzig, in 1941 and was formerly a test engineer with Volkswagen (Australia) Pty. Ltd.

Mr. F. K. Keysell has been appointed to the Division of Wildlife Research to assist in studies of the biology of grey kangaroos in New South Wales. Mr. Keysell graduated B.A. from the University of Cambridge in 1962 and came to Australia this year.

Mr. D. C. Knight has been appointed to the Computing Research Section, Adelaide, where he will assist in the establishment and operation of the satellite computer. Mr. Knight graduated B.Sc.(Hons.) from the University of London in 1957 and was formerly a computer programmer at the Weapons Research Establishment, Salisbury.

Dr. Barbara M. McDougall has joined the Division of Soils where she will investigate the chemical nature of plant root exudates, mechanisms of exudation, and the importance of exudates in the nutrition of



Dr. B. M. McDOUGALL

micro-organisms. Dr. McDougall was formerly a Research Assistant in biochemistry at the Massachusetts Institute of Technology. She graduated B.Sc. from the University of Melbourne in 1954 and Ph.D. from the Australian National University in 1960.

Mr. B. F. McKeon, formerly Senior Executive Officer of the Victorian Department of Agriculture, has been appointed as an Assistant Secretary at Head Office. He will handle those phases of the work of the Secretariat connected with the agricultural and biological Divisions. Mr. McKeon graduated B.Agr.Sc. from the University of Melbourne in 1936 and has had extensive experience in cereal research, extension work, and administration with the Victorian Department.

Dr. M. G. C. Mullins, formerly of the East Malling Research Station, Kent, has been



Dr. M. G. C. MULLINS

appointed to the Horticultural Research Section, Adelaide. Dr. Mullins will investigate the environmental control of flowering, fruit development and plant growth. He is a graduate in agriculture from the University of Reading and obtained his Ph.D. from the University of London in 1963.

Visitors from Overseas

Mr. F. Fei Tan Chu, a Colombo Plan Fellow, arrived at the Division of Forest Products in March to commence a two-year period of training, principally in the field of wood anatomy. Mr. Chu, who is a graduate of the National Taiwan University, is a member of the staff of the Forest Department, Sarawak.

Professor J. C. Edozien, Professor of Chemical Pathology, University College, Idaban, Nigeria, visited Australia during March and April as a guest of the Department of External Affairs. He inspected CSIRO laboratories and other research centres in Perth, Adelaide, Melbourne, Canberra and Sydney. Professor Edozien was particularly interested in the organization of Australian scientific research, the organization of agricultural, medical and health services, and the teaching of medicine.

Dr. Tsuneo Kishima, a wood anatomist and Director of the Wood Research Institute, Kyoto University, Japan, recently spent two weeks at the Division of Forest Products, mainly for discussions with the Wood and Fibre Structure Section.

Dr. S. K. Kon, head of the Nutrition Section of the Department of Physiology and Biochemistry, University of Reading, U.K., visited the Division of Dairy Research during a recent trip to Aus-

tralia. During the war Dr. Kon made a close examination of the effect of wartime diets on human milk. He has been Editor-in-Charge of the British Journal of Nutrition and of the Proceedings of the Nutrition Society since these two journals were first published.

Dr. R. Maud, a pedologist on the staff of the South African Sugar Association, Mt. Edgecombe Experiment Station, Natal, is spending one year at the Division of Soils. Dr. Maud was recently awarded the Selby Fellowship by the Australian Academy of Science and will work with Dr. C. G. Stephens on the role of geomorphic processes in soil development.

U. Aye Myint, who is on the staff of the Forest Department, Burma, arrived at the Division of Forest Products early this year for training in timber seasoning. He is in Australia for six months on an F.A.O. Fellowship.

Junior Farmer

Miss Jeanette Leonard, who works at the Irrigation Research Laboratory, Griffith, was a State finalist in the ABC's Junior Farmer Competition for 1964.

Jeanette won the Riverina division at Wagga before going to Sydney for the finals.

Mr. P. Milner, an M.Eng.Sc. graduate from the University of Melbourne has joined the Division of Mechanical Engineering where he will design and develop a programming system for use with the Division's computer link.

Dr. K. Ouchi has been appointed to the Division of Coal Research to investigate hydrogenation and other reactions of aromatic compounds likely



Dr. K. OUCHI

to be present in coal. Dr. Ouchi graduated D.Sc. from Tokoku University in 1956 and was formerly employed at the Resources Research Institute, Japan.

Mrs. J. A. Pearson has joined the Division of Food Preservation to assist in biochemical aspects of studies on the syn-



Mrs. J. A. PEARSON

thesis and biology of cyclopropanoid compounds. Mrs. Pearson graduated M.Sc. from

the University of Sydney in 1951 and from 1949 to 1955 was employed in the Plant Physiology Unit of the Division of Food Preservation.

Dr. H. N. Sinha, an Indian citizen, has been appointed to the Division of Mineral Chemistry to work on beach sand utilization, pressure hydro-metallurgy and gold recovery. Dr. Sinha graduated M.Eng.Sc. from the University of Benares, India, in 1954 and Ph.D. from the University of Melbourne in 1956. From 1958-1961 he was assistant Professor of Technology, Bombay, and since 1961 he has been a research fellow of the Australian Institute of Nuclear Science and Engineering at the University of Melbourne.

Mr. D. J. Ward has joined the Division of Textile Physics where he will assist in the development of yield testing equipment. Mr. Ward graduated B.Sc. from the University of New South Wales in 1963.

Dr. F. B. Whitfield has joined the Division of Food Preservation where he will investigate the chemical and biochemical factors affecting the flavour,



Dr. F. B. WHITFIELD

colour, and texture of frozen fruits and vegetables. Dr. Whitfield obtained his Ph.D. from the University of New South Wales in 1963 and was formerly a research fellow at that university.

Printed by CSIRO, Melbourne

CORESEARCH

FOR CIRCULATION AMONG MEMBERS OF CSIRO STAFF — NUMBER 63, MELBOURNE, JUNE 1964

NEW LAB. FOR WESTERN AUSTRALIA



The construction of a new primary industries laboratory for CSIRO in the Perth suburb of Floreat Park has been recommended by the Parliamentary Standing Committee on Public Works.

The new building, a model of which is shown above, will replace the present headquarters of the Western Australian Regional Laboratory which are temporarily located on the University campus.

The twenty-eight acre site for the new laboratory is opposite the Empire Games Stadium and adjoins University land.

Tenders for the building, which is estimated to cost about £437,000, will be called in the first half of next year.

The laboratory will be constructed of reinforced concrete, will have four floors and a total floor area of 43,000 square feet.

Provision has been made in the design for future installation of air-conditioning.

The Divisions of Plant Industry and Soils will be the two major groups represented in the new primary industries laboratory.

The building will also house workers from the Divisions of Entomology, Fisheries and Oceanography and Mathematical Statistics.

There will eventually be a laboratory staff of one hundred and fifteen.

Dr. R. C. Rossiter, Officer-in-Charge of the Western Australian Regional Laboratory,

said that the Division of Plant Industry would continue its work on plant introduction and nutrition, soil fertility, agronomy, pasture utilization, and pasture chemistry.

The pasture utilization programme would be strengthened in the near future and efforts would be made to commence work on plant breeding and genetics.

The Division of Soils planned to continue and extend its studies on pedology, hydrology, rhizobium survival, soil chemistry, and pine nutrition.

It was expected that the new building would eventually become part of a much larger complex containing a secondary industries laboratory and a section for the Division of Wildlife Research.

Soviet Whalers Visit Melbourne

After seven months at sea a Russian whaling fleet of two factory ships and thirty-two whale chasers tied up at Melbourne in April before returning to Odessa on the Black Sea.

This provided the 1,900 men and women of the fleet with a chance to see the sights of Melbourne; it also provided Dr. M. E. Winfield, of the Division of Organic Chemistry, with an opportunity of obtaining seventy pounds of whale meat for myoglobin research.

Myoglobin, a substance similar to haemoglobin, the red pigment in the blood, is widely distributed in the animal kingdom, and whales have large quantities of it. Myoglobin enables them to store oxygen within their tissues and stay under the water for long periods.

The Russians were able to provide Dr. Winfield with a sample of meat which had been taken from a whale shortly after capture and frozen immediately.

The whale had been caught close to the mother ship and hauled straight on board. The meat had been carved from a selected portion of the carcass under the direction of a medical officer.

In exchange for the meat the Russians accepted three books on Australian fishes.

While the fleet was in Melbourne, Mr. J. E. Cummins of Head Office, Mr. T. R. Cowper of the Division of Fisheries and Oceanography, and Dr. A. F. A. Berson of the Division of Meteorological Physics paid Fleet Commodore Alexei Solyanik an official visit.

Commodore Solyanik, who has made eighteen trips to the Antarctic, said that the fleet had had a very successful season — only one whale short of their quota of 5,140.

Throughout the last season all catchers, at two-hourly intervals, reported the presence or absence of whales, the species, their numbers and direction of travel, existing weather conditions, sea temperature and salinity, and the presence or absence of shoals of surface krill.

Commodore Solyanik said that accumulated information of this nature had assisted the fleet in locating and following whales, and had helped contri-

bute to the season's successful catch.

The usual method of killing whales is by the use of harpoons, the heads of which contain an explosive charge which detonates on impact.

But this method has many disadvantages. Whales killed outright will sink unless the catcher can get alongside to inflate the dead whale with air.

The Russians have now completed a successful series of experiments in which an injection of curare is fired into the whale.

This injection produces a rapid state of anaesthesia and the whale floats until it is picked up.

The curare method should be used on a large scale next season.

Commodore Solyanik said that standard radioteletype equipment on board the factory ship *Sovietskaya Ukraina* enabled the ship's meteorological team to receive international weather broadcasts from which they constructed weather maps.

The ship was also equipped to receive facsimile broadcasts of weather maps from Mirny, the main Russian base on the Antarctic coast, and from Canberra.

Meteorological observations from the *Sovietskaya Ukraina* and other whaling ships are made available to the International Antarctic Analysis Centre and are of great value for southern hemisphere weather map analysis.

Marksman

Mr. R. F. Buchan, of the Chemical Research Laboratories, recently won a place in the Victorian team participating in the interstate shoot of the Australian Clay Target Club.

The interstate match was held in May on the Alexandra Gun Club's range near the Eildon Weir, Victoria.

In fourteen years of competitive shooting Mr. Buchan has won twenty-four championships.



At the Dinner Dance

Miss Jennifer Minchin, of the Division of Mathematical Statistics, was chosen Belle of the Ball at the annual dinner dance held by Melbourne Divisions at the Royale Ballroom last month. She is pictured with Mr. J. E. Cummins of Head Office who presented her with a sash and a bouquet of flowers.

More than six hundred people attended. The award for the best table motif was won by the Chemical Research Laboratories for their ingenious apparatus suitable for home distillation of alcohol.

HONOURS

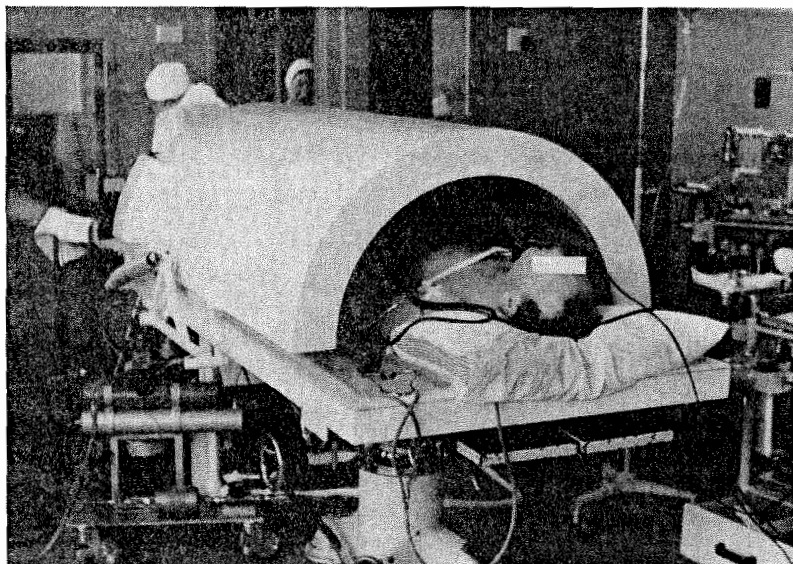
Three CSIRO scientists were among the six people made Fellows of the Australian Academy of Science recently. They were:

Dr. A. T. Dick, of the Division of Animal Health, for "distinguished contributions to the understanding of mineral inter-relations in animals, and particularly for studies of copper poisoning".

Dr. J. D. Morrison, of the Division of Chemical Physics, for "distinguished work in the field of mass spectroscopy, particularly its use in the study of ionization and excitation processes in molecular ions".

Dr. J. P. Wild, of the Division of Radiophysics, for "distinguished contributions to the study of solar bursts in radio astronomy".

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RADIANT COOLER AIDS SURGEONS

A radiant cooler designed and constructed by the Division of Mechanical Engineering is helping surgeons at Prince Henry's Hospital, Melbourne, by reducing the deep body temperature of surgical patients prior to operation.

The cooler is still in the experimental stage but promising results have already been obtained with craniotomy and aortic graft patients at the hospital.

The apparatus, which absorbs radiant heat, is intended to reduce the temperature of a patient weighing about 150 pounds from 98°F. to 86°F. in about one and a half hours.

It offers an alternative to the technique of immersing the patient in an ice bath, commonly used in neurosurgery.

The device consists of a lower cooling panel carrying an inflated mattress on which the patient lies and an upper cooler in the shape of a half-cylinder. The latter is hinged to allow easy access to the patient. The mattress is made of polythene, a material highly transparent to long wave radiation.

Both parts of the apparatus can be run at temperatures down to minus 10°F., and the average skin temperature of the patient can be maintained at about plus 70°F.

The radiant cooling technique applied to surgical

patients is in its preliminary stage and is being carried out by Mrs. E. Kaletsky, of the Division of Mechanical En-

gineering, in collaboration with Dr. C. R. Proctor and Dr. T. P. Crankshaw of Prince Henry's Hospital.

New Films for Release

"Current Research in Entomology", a recent production by the Film Unit will receive its premiere in London next month at the Twelfth International Congress of Entomology.

The film contains extracts from previous films on biological control, the cattle tick, and insect tissue culture, together with a section on the life history and habits of termites. One slow motion sequence shows how soldier termites distract their enemies by squirting them with a secretion which hardens on exposure to air.

Another sequence shows how termites lay scent trails.

The film is in colour and runs for about twenty minutes.

It will not be available for screening in Australia until later this year.

Another recent film by the Unit, "Research on Survival in Bushfires", shows field tests conducted by Dr. A. R. King of the Division of Physical Chemistry on a survival tent made of aluminium foil laminated to fibreglass cloth.

The film shows that a man sheltering under the tent suffers comparatively minor discomfort, even when only several feet away from a wall of flames between ten and thirty feet high.

The tent is not the complete answer to the survival problem of trapped fire fighters, but in the hands of experienced people it can be of considerable use.

The film is shot in colour and runs for about twenty minutes. Screening will be limited to audiences of fire fighters.

Safety Notes Consultant

Dr. D. O. Shiels, who was appointed by the Organization as an industrial health consultant for a three month period from 3 February this year, has agreed to continue as a consultant for a further three months.

Award

The Film Unit has received a Silver Medallion in the 1964 Australian Film Awards for its film "A Matter of Survival—Toxic Solvents".

The aim of the film is to make laboratory workers aware of the safety precautions which should be observed in handling toxic solvents.

The film was entered in the teaching section and was commended for its sharp warning on some of the dangers to be encountered in a laboratory.

Soil Team for N.T.

A party of eight from the Soil Mechanics Section left Melbourne last month to make the first study of the soils of the Northern Territory in relation to engineering problems.

Over the past three years the Soil Mechanics Section has studied problems of engineering development in several areas of Queensland and it will apply the methods of terrain evaluation developed during this work to the Katherine area.

At Katherine the party will be joined by Mr. G. A. Stewart, Chief of the Division of Land Research and Regional Survey.

The Division has already carried out an agricultural study of the Tipperary region in the vicinity of Katherine.

Dr. T. M. Griffiths and Dr. A. Mead, two scientists from the University of Denver, U.S.A., will also join the group at Katherine. They are studying terrain evaluation methods in Australia as part of a world-wide study.

The party will study an area of about 10,000 square miles around the town of Katherine. They will classify the land as to its type and suitability for the building of engineering projects such as roads, dams and airstrips.

An attempt will be made to work out a system of terrain classification, not only of where mountains and rivers are located, but what types of soil exist and their suitability for engineering projects.

With detailed information of this sort available, engineering projects will be worked out eventually by computers.

The party will travel in a group of vehicles equipped for soil mechanics investigations in the field. The first vehicle is a 30 cwt., four-

wheel-drive International Panel Van with trailer attached, which will be mainly used as a transport and supply unit.

A second International panel van will tow a caravan 24 feet long, completely equipped as a mobile soil mechanics laboratory. The third unit is a Land Rover equipped with a drill rig for taking soil samples for testing.

Dr. G. D. Aitchison, Officer-in-Charge of the Section, and leader of the party, said that they would take about one thousand soil samples for testing.

This was a large number of samples considering that major engineering projects usually took less than one hundred.

Following the Katherine survey, a group of scientists from four countries will gather in Darwin to discuss the use of terrain evaluation for studying the engineering problems of underdeveloped areas.

Representatives of United Kingdom, South Africa, U.S.A. and Australia will take part in a Mobile Field Conference which will traverse Northern Australia from Darwin to Cairns during August.

Australia will be represented by officers from the Division of Land Research and Regional Survey and the Soil Mechanics Section.

The object of the Conference is to facilitate the development of the use of terrain evaluation for engineering purposes.

The methods of terrain evaluation used in each country will be applied and examined as the Conference moves across the outback areas.

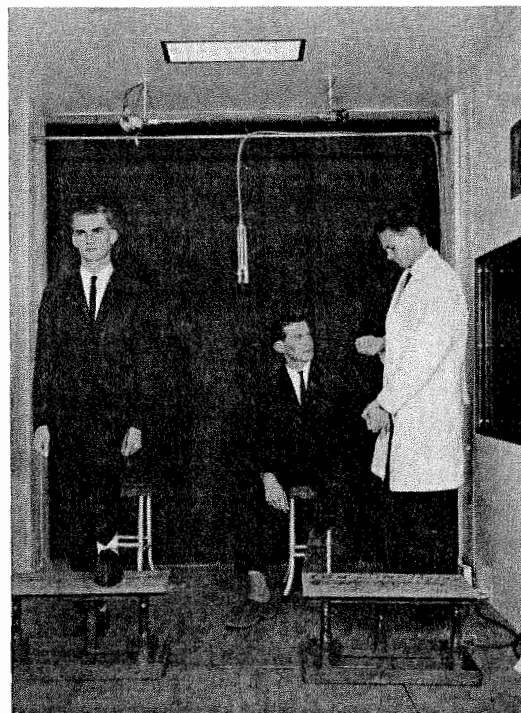
TECHNICAL ASSOCIATION NEWS

The Association's Council-in-Person meeting was held at Head Office on May 2 and 3. Delegates from all branches spent some fourteen hours discussing major items affecting the Organization's technical staff.

Some subjects, such as salary increases, have yet to be fully resolved. Existing anomalies, especially in the T.A. 1 grade, were brought to the attention of the Secretariat at the meeting on 4 May.

Association members should contact their Divisional delegates for information on other agenda items.

Below: Geoff Richards, Bill Menzies, Jack Coombe and Gordon McLennan discuss Gazette items at the Head Office conference.



The two people above wearing suits are taking part in an experiment conducted by Mr. H. G. David of the Division of Textile Physics to find the amounts of moisture retained by woollen suits when worn in various climatic conditions. One of them is engaged in light exercise while the other is having his pulse rate checked by Dr. G. M. Budd of the Department of Public Health and Tropical Medicine. The experiment is being conducted in a wind tunnel at the University of Sydney under controlled conditions of temperature, humidity and wind speed.

IN THE DEEP SOUTH

Mr. Gruntis Grauze of the Division of Meteorological Physics and Mr. Ken Simpson of the Division of Wildlife Research returned to Australia recently after spending four months on Macquarie Island with the Australian National Antarctic Research Expedition (ANARE).

ANARE's biological work is concentrated on Macquarie Island rather than on the Antarctic Continent because of the greater opportunities available on the Island.

Dr. R. Carrick, of the Division of Wildlife Research, who has visited Macquarie Island four times, directs the bird and seal research work.

Bird studies include a general survey of the distribution, numbers, and breeding of all species, the banding of several

The Division of Meteorological Physics has been using Macquarie Island as a base to measure the ozone content of the upper troposphere and lower stratosphere at altitudes between 50,000 and 100,000 feet.

While ozone exists at these levels in concentrations of less than one part in a million, it is an excellent tracer for studying stratospheric wind circulations.

Such studies are providing information of motions in the upper atmosphere, and should lead to improved weather forecasts.

Right: Mr. F. de Silva, of the Division of Meteorological Physics, using a Dobson spectrophotometer at Macquarie Island to measure the ozone content of the upper atmosphere. Left: Conversation piece between wandering albatross and Kent Keith, of Wildlife Research.



Politically part of Tasmania, Macquarie Island is roughly equidistant from Australia, New Zealand and Antarctica. The Island supports at least twenty-one species of breeding birds, two species of breeding seals, and distinctive flora and invertebrate fauna.

Animals and birds have no natural enemies on land, except for feral cats, and so are fearless, conspicuous, and easy to study.

Rats, cats, and rabbits were introduced during the nineteenth century and severely depleted the native fauna and flora.

The Island is now a sanctuary, and has almost recovered from last century's exploitation of its seals and penguins.

CSIRO has been associated with the work of ANARE since 1953.

species for migration records, flipper-banding of royal penguin chicks, and annual checks of the wandering albatross.

The albatross is slowly recovering in numbers after extermination last century by hungry sealers and castaways.

Observations of the elephant seal population have shown that females have their first pup at four to seven years, compared with three years in the exploited under-strength population on the island of South Georgia.

Males at Macquarie Island do not appear in the breeding season until the age of six years and are not fully operational "beachmasters" until about fifteen years old.

At South Georgia they may be beachmasters at six years.

This Month's Overseas Travellers

Dr. E. K. Bigg, of the Division of Radiophysics, is spending five months at the National Centre for Atmospheric Research, U.S.A. Dr. Bigg will also visit research centres in the U.S.A., the U.K. and Europe, and will work on ice nucleus measurements at the Department of Cloud Physics, University of London.

Mr. M. Grncarevic, of the Horticultural Research Section, Merbein, left Australia recently for Syria where he will spend six months as a technical consultant with the Food and Agriculture Organization of the United Nations. Mr. Grncarevic will advise the Syrian Government on modern

methods of producing and processing dried raisins. He will also visit Greece and Turkey to inspect centres of dried fruit production.

Dr. E. F. Henzell, of the Division of Tropical Pastures, is at present visiting pasture research centres in the U.K. and Europe. He will also spend several months in the U.S.A. studying the nitrogen nutrition of pastures and the role of nitrogen in soil fertility.

Mr. W. E. Hillis, of the Division of Forest Products, returned recently from overseas where he attended the 3rd International Symposium on the Chemistry of Natural Products at Kyoto, Japan. Mr. Hillis also attended a Symposium on the Chemistry of Natural Phenolic Compounds at Tokyo University.

Mr. E. D. Mieztis, of the Division of Plant Industry, is at present in the U.K. assisting in the examination of fruit consigned to ports in the U.K. and Europe. This is part of a co-operative experiment organised by CSIRO and the Australian Apple and Pear Board. He will be assisted by staff from the Refrigerated Cargo Research Association and the Agricultural Research Council.

Dr. J. R. Price, Chief of the Division of Organic Chemistry, and Dr. J. W. Loder, also of the Division of Organic Chemistry, returned last month from Japan where they attended the 3rd International Symposium on the Chemistry of Natural Products at Kyoto. While overseas, they also visited research institutes in Thailand, Hong Kong and Japan.

Dr. J. L. Wheeler, of the Division of Animal Physiology, left Australia recently to spend a year visiting research institutes in the U.K., Europe and U.S.A. In U.S.A. he will work on problems of crop utilization by grazing stock. He will also attend the 9th International Grasslands Congress in Sao Paulo, Brazil.

Dr. W. K. Zimmerman, of the Division of Organic Chemistry, left Australia last month for the U.S.A., the U.K. and Europe, where he will spend five months visiting research institutes to study the latest developments in microanalysis.

CONFERENCE

The organizers of the 2nd Australasian Conference on Hydraulics and Fluid Mechanics, which will be held at the University of Auckland, December 6-12, have invited papers on all aspects of fluid mechanics, hydraulics, and pondence should be addressed to the conference convener, C/- The University of Auckland, School of Engineering, Ardmore College, Post Office, Auckland, New Zealand.

EXHIBITION

An exhibition of scientific instruments will be held at Sydney University from 18 to 21 August by the N.S.W. branch of the Australian Institute of Physics.

Enquiries regarding the display of new instruments or the novel use of existing instruments should be sent to the Exhibition Committee Chairman, Dr. J. C. Kelly, School of Physics, University of N.S.W.

Beating the Brigalow

Brigalow suckers in Queensland scrub country are expected to yield to an implement at present on loan to the Division of Tropical Pastures.

Known as the Holt Bush Breaker it consists of three rolling sections each forty inches long and weighing two thousand pounds. Each section has a cast iron core to which is fitted four cutting blades.

The angle of the cut and the weight of the section are claimed to give each blade a cutting power of over sixty pounds per lineal inch.

Two of the three sections are set in line while the central section trails behind.

This combination will cut a swath eleven feet wide, but additional sections can be added to cut a wider swath.

Brigalow suckers must be at least six feet high before the implement will operate effectively on them.

The bush breaker has been used in Africa for the control of sheet erosion. It forms a series of depressions in the soil and these hold rainwater and provide a seed bed for grass regeneration.



"See what I mean? He's a lousy scientist, but a great administrator."

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APPOINTMENTS VACANT

The following vacancies for professional appointments are current:—

ENGINEER—MECHANICAL OR CHEMICAL (Class 2/3)—Division of Protein Chemistry, 462/197 (June 19).

RESEARCH OFFICER, STATISTICIAN (R.O./S.R.O.)—Division of Mathematical Statistics, 410/165 (June 12).

EXPERIMENTAL OFFICER (E.O. 2/3)—Division of Radiophysics, 780/349 (June 12).

EXPERIMENTAL OFFICER (E.O. 1/2)—Division of Entomology, 180/245 (June 5).

EXPERIMENTAL OFFICER (E.O. 1/2)—Division of Textile Industry, 464/328 (June 12).

RESEARCH OFFICER, BIOCHEMIST (R.O./S.R.O.)—Wheat Research Unit, 631/19 (June 12).

Visitors from Overseas

Mr. V. V. Dhruvanarayana, of the Central Arid Zone Research Institute, India, is spending four months in Australia on a UNESCO Fellowship. Mr. Dhruvanarayana is studying ground water resources in arid zones and will visit CSIRO laboratories at Canberra, Griffith and Deniliquin.

Professor J. B. Falls, of the Department of Zoology, University of Toronto, is spending six months sabbatical leave at the Division of Wildlife Research. Professor Falls is studying the significance of bird vocalization and will work with Dr. R. Carrick on the population ecology of the Australian magpie.

Mr. P. J. Jackson, of the Central Electricity Generation Board, Marchwood, England, visited the Chemical Research Laboratories last month to examine techniques in applied chemistry, mineralogy and physico-chemistry. He was in Australia to attend the Institute of Fuel Symposium on the Inorganic Constituents of Fuel, held at the University of Melbourne. Mr. Jackson also visited the Division of Coal Research.

Mr. E. C. Large, who recently retired from the British Ministry of Agriculture's Plant Pathology Laboratory at Harpenden, is visiting Australia to

gather material for two books he plans to write. One of these will be a sequel to his book "The Advance of the Fungi", the other a practical manual on plant disease measurement and survey. Mr. Large visited the Division of Plant Industry last month and will visit each State before returning to the U.K.

Dr. G. Laxer, Director of Product Development and Technical Service of the International Wool Secretariat and

Dr. G. H. Crawshaw, Manager of the I.W.S. Product Development Section, visited Melbourne last month to obtain first hand information on the wool processing research carried out by the Division of Protein Chemistry.

They were accompanied by **Dr. D. F. Louw**, Acting Director of the South African Wool Textile Research Institute.

The three visitors were particularly interested in the work of the Division of Protein Chemistry on the development of a continuous felting process, the prevention of yellowing of white wools, and the development of an extremely rapid setting process. The International Wool Secretariat regards these as three important fields of wool research.

APPOINTMENTS TO STAFF

Miss J. Chia has been appointed to the Division of Animal Health, Sydney, where she will assist in research into



Miss J. CHIA

the biochemical aspects of animal pathology. Miss Chia graduated B.Sc. from the University of Sydney in 1960, and has worked as an analyst for the Department of Customs and Excise, and as a biochemist at the Royal Prince Alfred Hospital, Sydney.

Mr. A. C. Fogerty has been appointed to the Division of Food Preservation, where he will assist in research on the relation between cyclopropanoid fatty acids and egg storage disorders. Mr. Fogerty graduated from the University



Mr. A. C. FOGERTY

of Sydney in 1953, and obtained his M.Sc. there in 1954. For the past nine years he has been conducting research on a wide variety of industrial, pharmaceutical and agricultural chemicals for Drug Houses of Australia and Monsanto Chemicals.

Mr. L. C. Fried has joined the Division of Chemical Engineering, where he will be attached to the Process Development Laboratory. Mr. Fried, a recent graduate of the Royal Melbourne Institute of Technology, will assist in the development of a new process for continuous dyeing of wool.



Mr. L. C. FRIED

Dr. P. Gillard has been appointed to the Division of Tropical Pastures. He will be stationed at the Townsville laboratory, and will work on

the development of productive pastures for tropical Eastern Australia. Dr. Gillard graduated B.Sc. in 1959 and B.Sc. with 1st Class Honours in Biochemistry in 1961 from the University of Witwatersrand, South Africa. He obtained his Ph.D. at the same university in 1963.



Dr. P. GILLARD

Mr. J. W. Hallam has been appointed to the Head Office staff as Safety Officer. Mr. Hallam's prime role will be to encourage an awareness in CSIRO staff of the importance of safety, and to develop the use of safe practices in all the activities of the Organization. He will also collaborate with Divisional Safety Officers, particularly in providing advice and help in such tasks as accident evaluation, and will take part in the development of the Organization's safety policy. Mr. Hallam obtained his Associate Diploma in Applied Chemistry from the Royal Melbourne Institute of Technology in 1947, and was made a Fellow of the Royal Australian Chem-



Mr. J. W. HALLAM

ical Institute in 1962. From 1942 to 1945 he worked as a chemist at the explosives factory at Maribyrnong and St. Mary's. He has been a research chemist at the research laboratories of Australian Paper Manufacturers Limited since 1946, and has been interested in safety for the last twenty years.

Mr. D. H. Maggs has been appointed to the Horticultural Research Section where he will



Mr. D. H. MAGGS

lead a research group at Merbein in fundamental and applied aspects of plant improvement. This programme is to be directed at improving Australian vines and other horticultural plants, and will involve breeding and selection studies. After graduating from Reading University in 1942 he was awarded a Colonial Scholarship to Cambridge and Trinidad. From 1944 to 1950 he was a plant breeder and geneticist with the Colonial Service at the Oil Palm Research Station in Nigeria. Since 1951 he has been a plant physiologist at the East Malling Research Station.

Mr. G. B. Storer has joined the Division of Biochemistry and General Nutrition where



Mr. G. B. STORER

he will assist with investigations into the nutritional biochemistry of ruminant animals. Mr. Storer graduated in Science from the University of Adelaide in 1952, and worked at the Institute of Medical and Veterinary Science, Adelaide, as a biochemist.

Mr. J. Tapping has joined the Division of Physics where he will assist in investigations relating to precision temperature measurement, the development and supervision of techniques for the maintenance of the Commonwealth Standards of temperature, and of calibrations in terms of these. After graduating in Science from the University of Adelaide in 1962, Mr. Tapping worked as a geophysical computer with Geoscismic (Aust.) Ltd.



Mr. J. TAPPING

Mr. R. H. Walker, a recent Science graduate of the Australian National University, has joined the Division of Fisheries and Oceanography, where he will assist in field and laboratory work on the examination and interpretation of collections made during the Division's survey of prawn resources in the Gulf of Carpentaria.

WOOD SAP CORRODES TOOLS

Mechanical wear is not always the only cause of wood-working tools losing their edge; the Division of Forest Products has found that chemical attack can be a major cause of blunting if the wood is cut when wet.

Microscopic examination of a steel tool after it has cut a thin chip a few inches long from a piece of wet radiata pine shows the cutting edge to be corroded.

This corrosion is relatively severe in the case of eucalypts.

Drops of acetic acid, which is the most common acid in woods, cause rapid corrosion of steel at concentrations in which the acid occurs in many woods.

During cutting, mechanical abrasion probably promotes corrosion at even lower concentrations.

Under less acid conditions, solutions of particular substances which are abundant in eucalypts were found to attack steel more rapidly than acetic acid.

These substances are phenolic compounds with a characteristic pattern of hydroxyl groups.

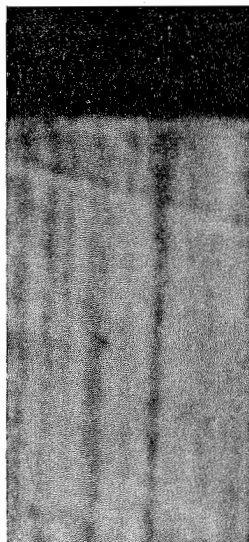
Experiments to reduce blunting have taken advantage of the electrical phenomena associated with chemical attack.

The attack has been suppressed by applying a negative voltage to the cutter, or by connecting it to an aluminium electrode embedded in the wood.

This work could have significance for the cutting of other organic materials containing acids and phenolic compounds capable of reacting with iron.

For example, microtome sectioning, which demands very sharp edges, is one technique which might benefit from recognition and prevention of this type of corrosion.

Below: Photomicrographs of steel cutting edges magnified four thousand times. Left—original state, showing lapping marks. Right—after cutting a chip three inches long in wet eucalyptus wood.



CORESEARCH

FOR CIRCULATION AMONG MEMBERS OF CSIRO STAFF — NUMBER 64, MELBOURNE, JULY 1964

NEW EXECUTIVE MEMBER

Professor Geoffrey Malcolm Badger, Ph.D., D.Sc., F.R.I.C., F.R.A.C.I., F.A.A., Professor of Organic Chemistry at the University of Adelaide, has been appointed to the Executive. Professor Badger, who fills the vacancy caused by the death of Dr. S. H. Bastow, will commence his duties with the Organization next September.

Professor Badger was born at Port Augusta, South Australia, in 1916 and was educated at Geelong College and the Gordon Institute of Technology.

After obtaining his M.Sc. from the University of Melbourne in 1938 he went to England where he obtained his Ph.D. at the University of London. In 1939 he was awarded a Finney-Howell Research Fellowship at the Royal Cancer Hospital, London.

He resigned from the Fellowship in 1941 to undertake war work with I.C.I. in Manchester, mainly on the development of anti-malarial drugs, and in 1943 he joined the Royal Navy as Instructor Lieutenant.

At the end of the war he was awarded an I.C.I. Research Fellowship and went to the University of Glasgow where he received his D.Sc.

He returned to Australia in 1949 to take up a position as Senior Lecturer in Organic Chemistry at the University of Adelaide, and in 1955 he became the University's first Professor of Organic Chemistry.

In the last 25 years, Professor Badger has produced more than 130 scientific papers and has published three books, his most recent being "The Chemical Basis of Carcinogenic Activity".

He has been co-editor of the Australian Journal of Experimental Biology and Medical Science for the last ten years, and is a member of the Advisory Committee of the Australian Journal of Chemistry.

Professor Badger was awarded the H.G. Smith Memorial Medal of the Royal Australian Chemical Institute in 1951 and was made a Fellow of the Australian Academy of Science in 1960.

He has been a member of the South Australian Committee of the Royal Australian Chemical Institute for a number of years and was President of the South Australian Branch of the Institute in 1957.

Professor Badger has been very active in university affairs.

He has been a member of the Executive Committee of the University of Adelaide's Anti-Cancer Foundation for nine years, and a member of the Foundation's Public Education Committee for two years.

He was a member of the Research Executive Committee of the University of Adelaide in 1961-62 and Chairman of the Committee in 1963-64.



Professor G. M. BADGER

He had also been President of the University's Staff Association, Chairman of the Board of Studies in Pharmacy, Dean of the Faculty of Science and a member of the Board of Research Studies.

While Professor Badger has been prolific in his output of scientific work his interests have developed along clearly defined lines.

His earliest work, done with Professor Sir James Cook at the University of London was concerned with the production of cancer by pure hydrocarbons and this has continued to be the dominating influence in his career.

Exploration of the relation between chemical constitution and carcinogenic activity has involved him in extensive synthetic work on polycyclic aromatic hydrocarbons, and on studies of the relative reactivities of different centres in these molecules.

The synthetic work has led to a detailed examination of certain synthetic processes such as the application of activated metal catalysts, with particular reference to desulphurization

reactions, and into the wide field of polynuclear heterocyclic chemistry.

These interests led to Professor Badger's authorship of two books on the chemistry of aromatic and heterocyclic compounds.

More recently they have led to an interest in photochemistry and to synthetic work in the porphyrin group.

But apart from minor excursions into alkaloid chemistry, Professor Badger's continuing interest has been in chemical structure in relation to carcinogenicity.

This has been further exemplified in recent years by studies on the formation of aromatic hydrocarbons at high temperatures.

Canberra Meeting

The Executive and Advisory Council met in the Academy of Science, Canberra, on Wednesday, 20th May, for discussions on the development of the Organization's research programme.

During the morning, Professor A. E. Rudd of the University of Adelaide talked on the need for expanding research for the Australian mineral industries.

Professor Rudd was chairman of a special committee set up by the Advisory Council last November to examine this problem.

He said that expansion of Australia's mineral industry was being impeded by the low level of research on mining, despite noteworthy efforts by the industry itself.

He said that the production of mining products in Australia in 1962, including those that had received primary processing, was valued at £268 million, but the expenditure for research on exploration and mining methods was only about £100,000.

However, a considerable amount of research and development was being carried out to assist the mineral processing industry.

C.S.I.R.O. spent about £400,000 a year on such research, and industry about £1 million.

Professor Rudd said that while expansion of research on mineral treatment was itself desirable, the building up of research on exploration and mining methods was an urgent and major task.

It was unlikely that mining companies would be able to supply further funds to support exploration and research, and the industry would look to the Commonwealth Government for finance.

During the afternoon the Council inspected the Controlled Environment Research Laboratory and the Division of Wildlife Research.

In the evening, the Executive and Advisory Council were joined at a buffet dinner by the Chiefs and Officers-in-Charge of all CSIRO Divisions and Sections.

On Thursday, the Advisory Council and the Chiefs and Officers-in-Charge met jointly.

Discussion centred on planning research to overcome problems of greatest importance to the national interest.

Sir Frederick White said that the Executive was vitally concerned

with maintaining a proper balance in its research to meet new needs created by changes in emphasis in primary and secondary industries.

He said that about 40 per cent of CSIRO's research effort was aimed at problems of the agricultural industry, while another 19 per cent was aimed at assisting those industries which processed the products of Australian agriculture.

About 16 per cent of the Organization's research effort was devoted to providing a background of scientific information of wide concern to a number of industries.

For example, the maintenance of the national standards of weights and measures was a responsibility of CSIRO.

The discoveries of new ore bodies had highlighted the need for research which would allow Australia to take full advantage of her mineral wealth.

At present only 16 per cent of CSIRO's effort was directed towards this.

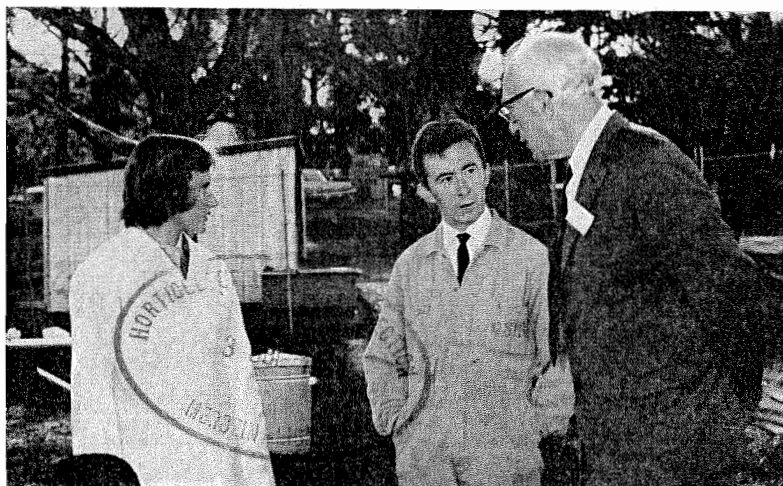
Sir Frederick then went on to say that Australian firms had established their own research laboratories in recent years and this trend was likely to increase.

He said that this move was welcomed by CSIRO as it was only by research within industry itself that new processes and products arose effectively from scientific discoveries.

Such developments also enabled CSIRO to devote more of its efforts to these fields of research which, while important in providing a background to industrial progress, were unlikely to be undertaken by private industry.

On Friday the Executive met with the Chiefs and Officers-in-Charge for discussions on a number of matters including collaboration in research between Divisions, evaluation of research staff, problems in presenting the Organization's budget to the Government, and the Organization's building programme.

Below: Advisory Council member, Professor Sir John Eccles, talks with Miss Meredith Clark and Mr. J. Merchant of the Division of Wildlife Research about their work on kangaroos.



APPOINTMENTS VACANT

The following vacancies for professional appointments are current:

RESEARCH OFFICER (R.O./S.R.O.)—Division of Animal Health.

201/223 (August 14)

RESEARCH OFFICER (R.O./S.R.O.)—Division of Tribophysics.

370/158 (July 31)

RESEARCH OFFICER-CHEMICAL ENGINEER (R.O./S.R.O.)—

Division of Chemical Engineering. 608/41 (July 17).

EXPERIMENTAL OFFICER (E.O. 1/2)—Division of Organic Chemistry. 606/47 (July 17).

RESEARCH OFFICER (R.O./S.R.O.)—Horticultural Research Section. 450/138 (July 30).

RESEARCH OFFICER (R.O.)—Division of Tropical Pastures. 850/214 (July 24).

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To Lead Fibre Research

Mr. W. L. Greenhill, Officer-in-Charge of the Fodder Conservation Section, leaves later this month to take up a position as Plant Fibres Expert with the Thailand Applied Scientific Research Corporation.

Mr. Greenhill has been seconded to the Research Corporation for two years under the Colombo Plan and will lead a research group studying problems of the production and utilization of plant fibres.

The Research Corporation, which has only recently been established, plans to examine problems connected with pro-



Mr. W. L. GREENHILL

duction of kenaf, roselle and jute, especially the extraction of higher quality fibre, and of other plant fibres, including cotton.

T.V. DRAMA

"Wind from the Icy Country", a play for TV by Robert Amos (the nom-de-plume of Bob Schoenfeld of the Editorial and Publications Section) will be presented in Melbourne on Channel 2 on July 29th at 8.30 p.m.

Production will be by Patrick Barton with Brian James, Patsy King, and Norman Kaye in the leading parts.

Like Bob's earlier prize-winning play "When The Grave Diggers Come", this play is set in the Far East.

SCIENCE AND GOVERNMENT

"Scientific research and government are more closely intertwined in Australia than in almost any other country," Senator Gorton told a meeting of the Victorian Branch of the Officers' Association last May.

In other industrial countries, he said, large enterprises contributed vast sums to research, and made large gifts to outside Foundations which did not always work in fields of interest to the donor.

This situation, however, was relatively unknown in Australia.

One function of government in Australia, therefore was to provide the finance required for scientific research.

Senator Gorton continued, "A good case can be made to show that a country like Australia cannot afford to contribute less than half its national income to scientific research.

"A similar case can also be made for defence, for roads, for health, for education, and so on.

"These cases are unanswerable, and the conclusion is that we cannot afford to do all the

things we cannot afford not to do.

"The Government is therefore forced to make arbitrary decisions as to how much money can be provided for any given field of work, and this decision is not necessarily related to what needs to be done."

A further function of government, said Senator Gorton, was to decide where the major effort should be made.

He emphasized that this was a job for the government not the scientist.

"Many choices are possible", he said, "and the government must decide on the most desirable according to its vision of the future of Australia."



Senator J. G. GORTON

"For instance, is the most important task the development of the Northern Territory?"

"Or should there be more emphasis on agricultural development, or research into problems of secondary industry so that our own industrial processes are developed and our foreign exchange saved?"

"Or should we devote our efforts to pure science—if there is such a thing—and spend the major part of our money on projects which, although not likely to produce results of immediate value, may eventually lead to something revolutionary?"

Senator Gorton said that a third function of government was to decide what instrumentality would carry out the Government's decision.

"Should the work be concentrated in CSIRO?"

"To what extent should Universities do research in the same field?"

"How much money should be provided to encourage industry to participate?"

"Should other governmental or semi-governmental bodies be brought in?"

"The responsibility for such decisions must again be taken by the Government."

Senator Gorton added that he would prefer not to see all research done by any one of these bodies, and that he would not like all research to be concentrated in CSIRO.

He believed that Universities should do more.

If it seemed likely that CSIRO's expansion in a field meant that the Universities would drop out, then he would prefer to see CSIRO restricted and the Universities get more money.

He was not worried that overlap and duplication might occur, but would be concerned if in such a situation there was inadequate exchange of information between individuals in different institutions.

The more people there were involved in trying to solve a problem, then, providing there was adequate co-operation, the greater the chance of reaching a solution.

Senator Gorton said that the fourth function of government in relation to science was the provision of proper administration.

"Good scientists believe their field of science is the only thing that matters", he said.

"This is how it ought to be and they should not be required to work out the plans of some building, or ensure that approved buildings and equipment are obtained by the date required."

"Nor should they have to make sure that all money allocated for the year is spent and does not return to consolidated revenue."

"These are the jobs of an administrative section quite outside scientific research although if a scientist can do it, then so much the better."

"The good administrator is familiar with regulations and knows how to cope with them."

"After performing the above functions, the Government should get out of the picture because it is not competent to tell those assigned to the task how to go about their project, or query whether the results can be shown to be scientifically valid."

"One can safely leave criticism of scientific results and theories to the scientists."

REVUE

More than one hundred and thirty people turned up to the Annual Revue and Dance of the Division of Textile Physics last month.

The Revue consisted of a sketch "Maxbeth" or "How Not To Succeed When Really Trying", "It's Your Party"—a political lampoon, and "Pride of the Regiment"—a sketch set in darkest Africa.

"Candid Camera", a film showing the Division's staff at "work", proved enlightening.

The Hermitage Singers gave a delightful performance of folk music and Mr. W. McLaughlin showed his versatility by making music with a saw and a lemon leaf.

During the Revue a didjeridoo played by Des Liddy came to an untimely end when a member of the audience attacked it with an axe.

Left: Miss Gwen Donars and Mr. J. Smith in "Pride of the Regiment".

Below: Party candidates Mr. J. Algie, Mr. M. Robinson and Mr. R. Gamble attempt to pacify irate voter Miss Cheryl Cliff.



Memorial Lecture

Dr. J. R. Vickery, Chief of the Division of Food Preservation, delivered one of the three lectures given at Cambridge on June 16th to commemorate the centenary of the birth of Sir William Hardy, the founder of food science.

Dr. Vickery spoke on Hardy's contribution to the application of science in the food and refrigeration industries.

The other lecturers were Sir Eric K. Rideal, formerly Professor of Chemistry at King's College, University of London, and Professor A. V. Hill, for many years Foulerton Research Professor of the Royal Society.

Sir William Hardy, who died in 1934, was Director of the Food Investigation Board which was set up in England at the end of the First World War.

He was also the first superintendent of the Low Temperature Research Station for Biochemistry and Biophysics at Cambridge.

Sir William Hardy was equally at home in both the physical and biological sciences, and originated the concept of food research as a field of applied biology.

HONOURS

Dr. R. C. Gifkins of the Physical Metallurgy Section, has been elected Federal President of The Australian Institute of Metals.

Mr. J. C. Griffith of the Division of Textile Physics, has been awarded a Ph.D. by the University of Sydney for a thesis on the effect of detergents on wool.

Mr. L. L. Muller of the Division of Dairy Research, has been awarded a Silver Medal by the Australian Society of Dairy Technology for a paper on new techniques which reduce the loss of casein during manufacture and at the same time improve the quality.

Dr. A. L. G. Rees, Chairman of the Chemical Research Laboratories, has been elected Secretary (Physical Sciences) of the Australian Academy of Science.

Overseas Visits

Dr. E. G. Bowen, Chief of the Division of Radiophysics, is at present in the U.S.A., at the invitation of the Lincoln Laboratory of the Massachusetts Institute of Technology, to discuss the design and construction of giant radio telescopes. He will also visit other research centres in the U.S.A. including the National Centre for Atmospheric Research at Boulder and the Jet Propulsion Laboratory at Pasadena.

Dr. H. E. Dadswell, Chief of the Division of Forest Products, left Australia last month for the U.S.A. where he will attend the annual meeting of the Forest Products Research Society in Chicago. He will also visit forest product research laboratories in Canada and England before attending the 10th International Botanical Congress in Edinburgh.

Dr. W. T. Denholm of the Division of Mineral Chemistry left recently to visit tin smelters and tin research laboratories in Malaysia, India, the Middle East, the U.K. and North America. He will be absent for a period of four months.

Dr. P. W. Geier of the Division of Entomology has left Australia to spend nine months visiting research institutes in Japan, the U.K., Europe and North America. He will also attend the 12th International Congress of Entomology in London.

Dr. A. R. Gilby of the Division of Entomology left last month for the U.S.A. where he is to spend nine months at the Department of Biology, Yale University, as a Research Associate. During this period he will attend the International Congress of Biochemistry in New York and visit research institutes in the U.S.A. and Canada. Dr. Gilby will return to Australia via the U.K.

Dr. T. S. Gregory, Chief of the Division of Animal Health, left Australia last month for the U.S.A., the U.K. and Europe. He will attend the 3rd International Meeting on Diseases of Cattle at Copenhagen and the 1st International Congress of Parasitology at Rome before returning to Australia via Israel and Thailand.

Dr. J. B. Langridge of the Division of Plant Industry left Australia recently to spend twelve months at the Pasteur Institute in Paris where he will conduct a study of the genetic structure of beta-galactosidase. Dr. Langridge may also visit the U.S.S.R., Poland and Czechoslovakia before returning to Australia.

Dr. B. Milligan of the Division of Protein Chemistry left Australia in May for a short visit to the U.S.A., after which he will travel to the U.K. where he is to spend a year working with the Natural Rubber Producers Research Association. Before returning to Australia in 1965, Dr. Milligan will attend the 3rd International Wool Textile Conference in Paris.

Dr. R. M. Moore, Assistant Chief of the Division of Plant Industry, left Australia last month to visit research centres in the U.K., Europe and the U.S.A. He will be absent for a period of nine months, and during this period will attend the International Botanical Congress at Edinburgh and the 9th International Grassland Congress in Sao Paulo, Brazil.

Mr. M. D. Murray of the Division of Animal Health left Australia recently for the U.S.A., the U.K. and Africa,

where he will visit research centres concerned with the study of blood-sucking insects which transmit diseases of animals and man, and also screwworm of cattle. He will be away for three months.

Dr. J. V. Possingham, Officer-in-Charge of the Horticultural Research Section, has left Australia for the U.S.A., the U.K. and Europe, where he will spend four months visiting horticultural research institutes. He is to attend the International Botanical Congress and will return to Australia via the U.S.S.R., India and Thailand.

Mr. J. E. Saunt of the Irrigation Research Laboratory, Griffith, is at present in the U.S.A., where he will spend three months visiting cotton research centres. He will return to Australia via the U.K., the U.A.R. and Israel.

Mr. K. L. Taylor of the Division of Entomology is at present visiting India before travelling to Europe, the U.K. and North America. He will visit research institutes in connection with the Division's programme on the biological control of *Sirex* wasp. He will also attend the 12th International Congress of Entomology in London.

Dr. M. V. Tracey of the Wheat Research Unit left Australia last month for the U.S.A. and the U.K. where he will visit research institutes engaged in work on cereal proteins and on separation and fractionation of plant proteins and cereal lipids. In New York Dr. Tracey will attend the 6th International Congress of Biochemists.

Dr. P. C. Wailes, of the Division of Organic Chemistry left Australia recently for the U.S.A. where he will spend



LULLABY OF BIRDLAND

The wedge-tailed eagle in our picture has not been lulled to sleep; it is a skin specimen from the collection of the Division of Wildlife Research. Professor A. Starker Leopold who is examining the specimen, is Professor of Zoology at the University of California, Berkeley, and is spending five months with the Division working on the wedge-tailed eagle. Professor Leopold is one of the world's foremost vertebrate ecologists and is an authority on the ecology of deer and American wild turkeys. Before coming to Australia he worked on the American golden eagle.

twelve months at the University of California working on organo-metallic compounds. He will return to Australia via U.K. and Europe.

Dr. D. F. Waterhouse, Chief of the Division of Entomology, has left Australia to visit research institutes in Thailand, the U.K., Europe and North America. He will attend the 12th International Congress of Entomology in London, the I.W.B.S. Assembly in Prague, and the I.W.F.R.O. Symposium in Oxford.

TECHNICAL ASSOCIATION NEWS

Another month has passed and still the negotiations for a salary rise have not been concluded. However, Council has been assured by the Secretariat that every effort is being made to reach agreement between CSIRO and the Public Service Board in order to submit a firm offer, along the broad lines of the AAESDA decision, to the Technical Association.

Most of the new Branch Committees held their first meeting during June and Central Council will be meeting on the third Tuesday in the month as usual. It is expected that Council meetings will be held at the Division of Animal Genetics at Ryde for the convenience of members. It is hoped that we can publish Council and Branch Committee members' names in the next issue of "Coresearch".

In the meantime it may be opportune to list the Branch Proxies who do considerable work on Council requiring only regular correspondence from their Branch to guide them.

Victoria—Harry Gillet (Division of Physics).
South Australia—Dawn Davies (Division of Animal Genetics).
Queensland—Kevin Wasson (Division of Applied Physics).
Western Australia—David Hollis (Division of Animal Physiology).
A.C.T.—Ron Coyte (Division of Animal Physiology).

The newly elected Publicity Officer and Editor of the "Gazette" is Tom Dagg of the Division of Animal Physiology.

Tom hopes to produce an edition of the "Gazette" as soon as negotiations have been concluded and ratified concerning the salary rise for Technical Staff.

However, to ensure publication at the appropriate time the Editor will require contributions from members and Branch Committees.

This means that, sufficient contributions forthcoming, we can publish details of a new determination by the Arbitrator immediately they are known to Council.

By this means we can let members have the details much sooner.

If you have anything to say which is worthwhile printing don't hesitate to send it on to The Editor, CSIRO Technical Association Gazette, P.O. Box 144, Paramatta, N.S.W.

Obituary Notices

Dr. J. P. FUNK

Dr. Josef Peter Funk, of the Division of Meteorological Physics, died in Munich last month after an operation.

Dr. Funk had accepted an invitation to spend six months working as Guest Professor with Professor F. Möller, Director of the Meteorological Institute of the University of Munich.

He left Melbourne in May to take up this appointment, but became ill while travelling and was admitted to hospital on his arrival.

After graduating from the University of Vienna in 1956, Dr. Funk came to Australia to take up a position as Development Engineer with A.W.A. in Sydney.

He joined the Division of Meteorological Physics in 1957 and established an international reputation in the study of atmospheric radiation.

He was a member of the World Meteorological Organization Working Group on Special Radiation Instruments and Observations and of the International Society of Biometeorology.

In 1960 he was awarded the Dorton Prize by the Royal Meteorological Society for a paper on an improved polythene shielded net radiometer.

Dr. Funk was a man of strong personal sincerity who brought to his work enthusiasm and a high degree of originality, particularly in the field of instrumentation.

His loss will be keenly felt by his colleagues as well as his friends outside the Division of Meteorological Physics.

Miss L. PLUNKETT

Miss Lillian Plunkett of the Editorial and Publications Section died last June after a painful illness which she endured with dignity.

Only a few months ago, she had been at her desk editing the "Australian Journal of Chemistry" and the "Australian Journal of Applied Science".

Miss Plunkett graduated in Science from the University of Sydney in 1923 and obtained the Diploma of Education at Oxford in 1934.

After carrying out research in Denmark, France, and England she joined the Division of Radiophysics in 1944. She became a member of the Editorial Section in 1950.

Miss Plunkett's contribution to the progress of Australian science was as distinguished as it was unobtrusive. She edited "Applied Science" and "Chemistry" from the day these journals were established.

With very little precedent to guide her, she had to cope with printers who were inexperienced in mathematical typesetting, artists who had never prepared scientific diagrams before, and impatient authors who in those days were inclined to look down on Australian journals with disdain.

How well she succeeded can be seen on the bookshelves of every major scientific library in the world.

Beyond that, she was a woman of extremely active mind, of a wide range of interests, and of a generous, lovable nature, always ready to "adopt" an author in difficulties or an overburdened colleague.

Australian science has lost a superb editor and, even more lamentably, the community has lost a truly valuable human being.

Mrs. D. LEWIS

Mrs. Dora Lewis, who for the last eleven years has wheeled her tea trolley around the corridors of Head Office, died suddenly last May after a short illness.

She was perpetually cheerful and was often heard as she went on her daily round singing the old time songs of the music hall.

Mrs. Lewis was a wonderful personality and was held in affection by all. She will long be remembered by her many friends at Head Office.

Visitors from Overseas

Professor A. E. Bell, Chairman of the Population Genetics Institute, Purdue University, who has been awarded a Fulbright research grant to spend nine months at the Division of Plant Industry, arrived in Canberra last month. Professor Bell will be working on the establishment of a Trifolium Laboratory for the testing of genetic theory of selection and the initiation of model experiments in the Division's Genetics Section.

SAFETY LAST

The recent transfer of the Sydney Regional Administrative Office from the National Standards Laboratory in the University Grounds to new premises in Crowsway was not without incident.

One of the last minute duties of the Regional Administrative Officer was to issue pistols to future payroll escorts.

A hurried summary of requirements for Police inspection, safe custody and Treasury regulations concluded with a demonstration of safe handling drill.

"Slip the cartridge case into position and push home."

"Safety catch on."

"At the first warning of danger, hold the pistol in the right hand, pointing out of harm's way. So."

"Safety catch off."

"Grasp the finger grip with the left hand, pull back and release."

"This carries a bullet into the firing chamber."

"Safety catch on."

"Now, if you pull the trigger, nothing will happen—like so."

BANG!!

"Funny. I could have sworn I put the safety catch on."

Dr. H. O. Mönig, Scientific Adviser to the Prime Minister of South Africa visited Australia last month. He was completing a world tour during which he examined questions of national science development. During his tour of Australia he called at Head Office for discussions with the Members of the Executive and the Secretariat. He also visited the Chemical Research Laboratories and the Division of Animal Health, as well as other government departments.

Dr. H. P. Stadler from the Department of Inorganic Chemistry, University of Newcastle-upon-Tyne, arrived in Melbourne last month where he is to spend four weeks at the Division of Chemical Physics. Dr. Stadler an x-ray crystallographer is to study the electron diffraction work of the Division.

Beatlemania

Beatlemania even finds its way into the hallowed halls of science.

If any undue excitement was noticed by visitors and telephone inquiries to Fisheries and Oceanography during the recent Beale assault, it was probably because Kathy Trout had learnt that she was one of 32 finalists from 10,000 applicants to attend Paul's birthday party.

Sponsored by a Sydney newspaper, seventeen girls were selected for the champagne and birthday cake supper but the other finalists were not forgotten.

Kathy and the others were invited to the hotel next evening to meet their idols—and Kathy is still starry-eyed.

APPOINTMENTS TO STAFF

Dr. M. Anson has been appointed to the Division of Building Research where he will assist in research on the conduct and management of building operations. Dr. Anson, who graduated B.A. with 1st Class Honours in Engineering Science from the University of



Dr. M. ANSON

Oxford in 1959 and obtained his Ph.D. at Imperial College London in 1962, has been working with the Engineering and Water Supply Department of South Australia.

Dr. E. B. Britton has been appointed to the Division of Entomology where he will be responsible for the organization and curation of the Coleoptera in the Australian National Insect Collection which is housed in the Division's Museum. Dr. Britton graduated B.Sc. from the University of Wales in 1933. He obtained his M.Sc. in 1935 and his D.Sc. in 1960. Since 1935 he has worked as curator and taxonomic entomologist at the British Museum (National History). He has been in turn Secretary, Editor and Vice-President of the Royal Entomological Society

of London and has acted as Entomological Editor for the Annals and Magazine of National History for the past eight years. Before taking up his appointment he will attend the International Congress of Entomology in London.

Miss L. E. Banfield has been appointed to the Division of Chemical Physics where she will assist in research on the application of mass spectroscopy to fundamental problems in chemical physics. Miss Banfield, a recent science graduate of the University of Western Australia, has been working temporarily with the Division of Applied Mineralogy.



Miss L. E. BANFIELD

Miss E. Davies has joined the staff of the Division of Dairy Research where she will be studying fat-protein interactions in dairy products. Miss Davies recently obtained her M.Sc. degree from the University of Melbourne.

Dr. W. T. Denholm has joined the Division of Mineral Chemistry where he will be responsible for originating and developing new techniques for chemical treatment of Australian ores. Dr. Denholm graduated B.Met.E. in 1947 and M.Eng.Sc. in 1952 from the University of Melbourne and obtained his Ph.D. at the University of Adelaide in 1960. He was until recently head of the Department of Metallurgy at the South Australian Institute of Technology.



Dr. W. T. DENHOLM

Mr. P. H. Frost has joined the Computing Research Section. Mr. Frost who recently obtained his Diploma in Numerical Analysis and Automatic Computing at the University of Cambridge has been working as a research assistant in the Mathematical Laboratory at Cambridge.

Dr. B. R. Grant has been appointed to the Division of Fisheries and Oceanography where he will join a research group studying the biochemistry of phytoplankton, particularly the unicellular diatoms and dinoflagellates. Dr. Grant graduated B.Sc.Agr. from the University of Queensland in 1958 and was awarded a Fulbright Scholarship to Purdue University where he obtained

his M.Sc. in 1960 and his Ph.D. in 1962. Since 1962 he has been engaged as a post-doctoral student at the University of California.



Dr. B. R. GRANT

Mr. L. A. Y. Johnston has joined the Division of Animal Health. He will be stationed at Townsville, where he will be responsible for studies on the epidemiology of bovine babesiosis in the tropical environment and the resistance of cattle to infestation with ticks. Mr. Johnston, who graduated B.V.Sc. from the University of Queensland in 1957, has been working as Veterinary Officer with the Queensland Department of Primary Industries, at their Animal Health Station, Oonoonba.

Mr. J. D. Kerr has been appointed to the Division of Mathematical Statistics, and will be stationed at the Division of Fisheries and Oceanography where he will assist and advise with statistical problems related to research programmes and in the collection and maintenance of records relating to fish populations. Mr. Kerr is a recent science graduate of the University of Queensland.



Mr. J. D. KERR

Dr. D. J. Langridge has joined the Computing Research Section. Dr. Langridge, a science graduate of the University of London, worked from 1949 to 1959 with the U.K. Ministry of Supply and from 1959 to 1962 with the U.K. Atomic Energy Authority. He has been working in Australia at the Electronics Data Processing Branch of the Department of Defence.

Mr. B. R. Thompson has been appointed to the Division of Animal Health where he will assist in investigations of helminth infections in sheep in Southern Australia. After graduating from the University of Edinburgh in 1951 Mr. Thompson worked as Provincial Veterinary Officer in Northern Rhodesia until 1953. From 1954 to 1960 he was senior veterinarian to the Putaruru Veterinary Club, New Zealand. He was engaged on a working holiday in Europe during 1961-1962 and on his return to New Zealand joined the Department of Agriculture.

Printed by CSIRO, Melbourne



C O R E S E A R C H

FOR CIRCULATION AMONG MEMBERS OF CSIRO STAFF — NUMBER 65, MELBOURNE, AUGUST 1964

David Rivett Medal Awarded

At the annual general meeting of the CSIRO Officers' Association last month, Lady Rivett presented the 1964 David Rivett Medal jointly to Dr. C. H. Gallagher of the Division of Animal Health and Dr. E. O. P. Thompson of the Division of Protein Chemistry for outstanding research in the biological sciences.

Dr. Gallagher received the award for his work on the pathological effects of carbon tetrachloride when administered into the trachea or rumen of sheep, and Dr. Thompson for his chemical studies on proteins.

This was the first occasion of the presentation of the medal which has been instituted by the Officers' Association to honour the memory of the late Sir David Rivett, formerly Chief Executive Officer and subsequently Chairman of the Council for Scientific and Industrial Research.

The award will be offered every two years for outstanding research by members of the Organization's research staff, alternate awards being intended for work in the biological and physical sciences.

The design for the medal is taken from a plaque, executed by well known Melbourne sculptor, Andor Meszaros, which is to be placed in the David Rivett Laboratory now being built for the Division of Chemical Physics near Monash University.

The design symbolizes the power of the scientific approach in piercing the clouds of ignorance and superstition and arriving at the truth. Ignorance and superstition are represented by primitive masks and other symbols of witchcraft, while in front of them the rising sun of enlightenment spreads its rays.

Dominating the whole scene is the head of Sir David Rivett representing the human intellect.



PHYSICAL METALLURGY HEAD

Professor M. E. Hargreaves has been appointed Officer-in-Charge of the Physical Metallurgy Section following the decision of Professor H. W. Worner to relinquish this position.

Professor Worner has been Officer-in-Charge of the Section since 1956.

He graduated from the University of Melbourne in 1944 as Bachelor of Metallurgical Engineering.

The following year he joined CSIRO and in 1947 he was awarded a CSIRO studentship which enabled him to proceed to the Cavendish Laboratory at Cambridge University where he obtained his Ph.D.

He returned to Australia in 1949 and joined the Division of Tribophysics, where he became a leading member of a group which carried out pioneering quantitative research on stored energy in plastically deformed metals and alloys.

These studies were combined with elegant measurements of the electrical properties and densities of metallic materials in order to throw new light on the extremely important ways in which crystal imperfections affect the well-known mechanical characteristics of metal and alloys.

In 1961 a group comprising Dr. L. M. Clarebrough, Dr. Hargreaves and Mr. M. H. Loretto, was awarded the David Syme Research Prize of the University of Melbourne in recognition of outstanding publications dealing with research on stored energy and crystal imperfections in metallic substances.

During his period of service in the Division of Tribophysics, Professor Hargreaves also concerned himself with the metallurgical aspects of bearing metals and alloys.

He is an active member of the Australian Institute of Metals, and has been President of the Melbourne Branch of the Institute since the beginning of 1963.



Professor M. E. HARGREAVES

Professor Hargreaves, who was formerly with the Division of Tribophysics, was appointed to the Chair of Physical Metallurgy in the University of Melbourne this year.

ESSAY

The A.C.T. Group of the Royal Institute of Public Administration has invited entries for an essay competition to be decided later this year.

Entrants may choose any subject relating to the historical development, or critical appraisal of some specific contemporary aspect or problem of public administration in Australia.

Entries should reach the Honorary Secretary of the A.C.T. Group, Mr. J. M. Williamson, c/- Department of Immigration, Canberra, A.C.T., by 31st August.

APPOINTMENTS VACANT

The following vacancies for professional appointments are current:

- RESEARCH OFFICER (R.O.)—Division of Entomology. 180/286 (August 28).
- RESEARCH OFFICER (R.O./S.R.O.)—Division of Entomology. 180/282 (August 28).
- RESEARCH OFFICER (R.O./S.R.O.)—Division of Radiophysics. 780/364 (August 28).
- SCIENTIFIC SERVICES OFFICER (S.S.O. 1/2)—Division of Textile Industry. 464/337 (August 28).
- SCIENTIFIC SERVICES OFFICER (S.S.O. 1/2)—Division of Protein Chemistry. 462/201 (August 28).
- RESEARCH OFFICER (R.O./S.R.O.)—Division of Tropical Pastures. 830/215 (August 21).
- EXPERIMENTAL OFFICER (E.O. 1/2)—Division of Applied Physics. 750/317 (August 21).
- RESEARCH OFFICER (R.O./S.R.O.)—Division of Animal Physiology. 245/302 (August 21).
- SCIENTIFIC SERVICES OFFICER (S.S.O. 2/3)—Division of Plant Industry, Duntroon. 132/143 (August 7).

Salary Rises For Technical Staff

CSIRO technical staff, draftsmen and tracers are to receive salary increases ranging from £52 to £548 a year.

The increases, which have been back-dated to 9th September, 1963, follow the decision of the Public Service Arbitrator last February in the Commonwealth Public Service "Technical Grades" case.

Since February, the new rates and the reasons given in support of them have been discussed with the CSIRO Technical Association, the Australian Association of Engineers, Surveyors, Draftsmen and Architects, and the Commonwealth Public Service Board.

The Executive has now decided that, subject to the retention of long standing practices specific to CSIRO, the new rates should be applied to CSIRO staff with similar classifications.

The new salary rates are shown below. These rates are nominal and are for men only. The salary rates for women are £154 less than the corresponding rates for men.

Nominal salary rates may be converted to actual rates by adding £185 in the case of men and £138 in the case of women.

Designation		Before 9/9/63 £			After 9/9/63 £		
T.A.	Gr. I	818	860	902	870	920	970
D.A.	Gr. I	944	986		1020	1070	
T.A.	Gr. II	1042	1084	1126	1120	1170	1220
D.A.	Gr. II	1168					
T.A.	Gr. III	1210	1252	1294	1270	1320	1370
D.A.	Gr. III						
T.O.	Gr. I	1322	1364	1420	1420	1470	1520
D.O.	Gr. I	1476	1532		1570	1620	
T.O.	Gr. II	1546	1602	1658	1670	1745	1820
D.O.	Gr. II						
S.T.O.	Gr. I	1672	1728	1784	1900	1975	2050
S.D.O.	Gr. I						
S.T.O.	Gr. II	1798	1854	1910	2140	2230	2320
S.D.O.	Gr. II						
S.T.O.	Gr. III	1924	1980	2036	2350	2440	2530
C.D.O.	Gr. I						
S.T.O.	Gr. IV	2050	2106	2162	2530	2620	2710
C.D.O.	Gr. II						

Agricultural Education Survey

Dr. R. N. Farquhar of the Agricultural Liaison Unit has been seconded to the Australian Council for Educational Research for twelve months to undertake a study of agricultural education and training in Australia.

Dr. Farquhar will examine the facilities in each State for training people for careers in agriculture including research and extension.

ing facilities, the development of new kinds of training, and the modification of existing systems.

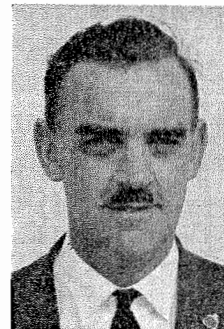
This study will be complementary to the work of the Committee on Tertiary Education of the Australian Universities Commission.

Dr. Farquhar is well qualified for the study. He has a farm background and was educated at an agricultural high school and an agricultural college before going on to University.

He graduated B.Agr.Sc. from the University of Melbourne in 1950 and spent the next few years with the Tasmanian Department of Agriculture working both in research and extension.

He joined the Agricultural Research Liaison Section in 1956 and from 1958 to 1960 was Ford Foundation Fellow and Fulbright Scholar at Cornell University in the field of agricultural extension education.

He received the degree of Doctor of Education from Cornell in 1961.



Dr. R. N. FARQUHAR

His survey will thus include both pre-university training at schools and agricultural colleges, and university training at both under-graduate and post-graduate levels.

He will also examine the need for the expansion of exist-

C 607/085.3) CO S(COR.)

FLYING FOKKERS AND DRIFTING SAND

Deborn Rock, lying somewhere between the coastal city of Perth and the goldfields of Kalgoorlie, never made a more cheerless impression on aero-mechanic George Howard as in those summer months of the year 1932.

But it is neither the noise of the possums which chase across the tin roofs hissing, nor the bleating of the sheep in the loading pens by the station that keeps Howard sleepless night after night.

Translated from a review of the book "Heisser Sand" (Hot Sand) by German author C. C. Bergius.

Again and again he thinks he hears the voice of his friend Captain Barlow, and if Howard is to believe his superiors in the Government Research Institute, the CSIRO, this is the voice of a dead man.

For Captain Barlow, who set out more than four months ago on a research flight over the dry Australian bush, has vanished.

The search which was undertaken immediately was fruitless, and even Pamela Barlow has given up all hope of ever seeing her husband alive again.

Only Howard continues to believe that he is alive, and his indignation is intense when he discovers that CSIRO has already appointed a successor to Captain Barlow.

One afternoon, cheerless and sad, Howard is tinkering with the newly arrived single-engined Fokker which will now be

flown by a stranger. But suddenly he listens and then rushes as if electrified from the hangar. The engine noise, becoming louder in his ears, can only come from the very machine in which Barlow took off 136 days before.

When the bi-plane, showing signs of emergency repairs, has landed, Howard races speechless to the machine and to the bearded pilot who, laughing and waving, clambers out.

After the first emotional greeting the mechanic learns Captain Barlow's unbelievable story which will now circle the world by telegraph.

When Sir Geoffrey Higgins, head of the CSIRO, hears of the unexpected return of the man believed to be dead, he anticipates impending embarrassment.

It is too late for him to cancel the appointment of the Englishman, Durban, and he has, in addition, reason to believe that there exists between Durban and Barlow's wife Pamela a certain personal relationship.

Captain Barlow appears at first to be unaware of this, and indeed it goes against his pilot's code of ethics to yield his command of the plane to a man who is unfamiliar with the country.

However, the tricks of the Australian countryside—the heat over the landing strip which suddenly lets the plane sag on landing, dried-out watercourses which make flying by the map so difficult, and sudden changes of wind which can force a machine imperceptibly off course—cause



The CSIR Ski Club occasionally attracts some odd types. One of the latest to join its ranks is this Norwegian beatnik photographed near the Falls Creek ski lodge by Building Research photographer Eric Smith.

troubles for the Englishman, as does the stubborn mechanic who now, as always, backs Captain Barlow.

In this way the Captain soon wins back the command of the Fokker which had been taken away from him. But still the Englishman will not admit defeat.

Does he not hold the trump card in the person of Pamela Barlow?

The contest is decided in a dangerous flying race, crossing the Australian continent from south to north, and the murderous sand wastes of the Never-Never have the final word.

NEWS IN BRIEF

Professor

Dr. A. B. Wardrop, of the Division of Forest Products, has been appointed Professor of Botany at the University of Tasmania.

O.B.E.

Mr. E. C. Langfield, of the Division of Land Research and Regional Survey's Coastal Plains Research Station, and Mr. T. A. Frankcomb, Member of the Tasmanian State Committee, were awarded the Order of the British Empire in the Queen's Birthday Honours List.

Governor

Dr. I. W. Wark of the Executive has been made a governor of "The Ian Potter Foundation". Sir Ian Potter, a leading Melbourne shareholder and company director, established the foundation recently as a charitable trust with a gift of shares worth about £1 million.

Doctor

Mr. C. H. Williams, of the Division of Plant Industry, has been admitted to the degree of Doctor of Science by the University of Adelaide.

M.P.'s for Council

Mr. K. E. Beazley, M.P., Federal Member for Fremantle (W.A.), and Mr. C. R. Kelly, M.P., Federal Member for Wakefield (S.A.), have been appointed to the Advisory Council.

Chairman

Dr. J. Melville, part-time member of the Executive and Director of the Waite Agricultural Research Institute, has succeeded Sir John Crawford as Chairman of the Australian Wool Industry Conference. The Conference is the ruling body of the Australian wool industry.

Visitor

Dr. W. L. Francis, Director of the Grants and Information Division, Department of Scientific and Industrial Research, United Kingdom, spent several days with CSIRO last month. Dr. Francis visited Head Office, the Chemical Research Laboratories, the National Standards Laboratory, the Divisions of Tribophysics, Textile Industry, and Food Preservation, and the radiotelescope at Parkes.

Exhibition

CSIRO will be one of the main exhibitors in a Science Exhibition to be held in Melbourne this month.

The exhibition has been arranged by the Science Teachers' Association of Victoria to mark the Association's 21st anniversary.

It will be held in conjunction with the Association's 13th Annual Science Talent Search in the western annexe of the Exhibition Building from the 7th to 15th August.

The Divisions and Sections taking part in the CSIRO exhibit include Chemical Engineering, Chemical Physics, Dairy Research, Mechanical Engineering, Meteorological Physics and Ore Dressing.

OBITUARIES

Mr. A. K. JAMES

Mr. Arthur Kevin James, of the Canberra Regional Administrative Office, died on 22nd June at the age of 37 years.

Mr. James joined the Canberra Administrative Office in 1947 as a junior clerk in the Salaries Section and at the time of his death held the post of sub-accountant.

He was for some time an active member of the CSIRO Canberra Social Committee and was responsible for organizing the first CSIRO Ball in Canberra.

Together with Len Richards, of the Sydney Administrative Office, he introduced the annual CSIRO football match between Sydney and Canberra. He will long be remembered by his many friends at Canberra.

Mr. H. JONES

Mr. Harold Jones, of the Division of Animal Physiology at Prospect, died on 2nd July.

Mr. Jones, who joined CSIRO in 1953, was senior animal attendant at the laboratory.

He was one of the first animal attendants employed by the Organization.

Mr. Jones was devoted to his work and will long be remembered by his friends at Prospect.

Credit Society May Raise Loan Maximum

The Directors of the CSIRO Co-operative Credit Society are at present giving close consideration to the possibility of raising the maximum for individual loans from £1,000 to £2,000, and it is hoped to reach a firm decision on this shortly. Meanwhile the governors have announced that there are still ample funds available to members wishing to obtain loans, and that there is practically no waiting period provided borrowers can provide adequate security.

Membership of the Society is open to all officers and employees of the Organization. The minimum requirement for membership is the purchase of five £1 shares in the Society. These may be purchased outright or by fortnightly instalments.

In the case of permanent officers, a lien on the borrower's superannuation contributions will be adequate security for most purposes, unless the borrower is a relatively new appointee and his contributions are small.

In such cases, registered mortgages on property owned by the borrower or assignment of life assurance policies (if the surrender value is sufficient) may be offered as security.

The maximum amount the Society can lend is £1,000, repayable over a period of five years at £9/5/11 a fortnight.

The total amount of money paid back on such a loan amounts to just over £1,200, so that the effective interest is equal to a flat rate of a little more than 4 per cent.

The Society carries the cost of the death-indemnity cover, under which policy the loan is automatically discharged in the event of the death of the borrower.

TECHNICAL ASSOCIATION NEWS

On the front page of this issue, the long awaited salary increases for technical staff are fully discussed. As all members should have received copies of the latest Bulletin 64/3 distributed immediately after our acceptance of the scales, we are hopeful of some further articles for the "Gazette".

Association Office-Bearers 1964/65

Central Council

Federal President: Mr. E. Murray (Coal Research).
General Secretary: Mr. W. Menzies (Animal Genetics).
General Treasurer: Mr. D. Rose (Food Preservation).
Publicity Officer: Mr. T. Dagg (Animal Physiology).

Western Australian Branch

Chairman: Mr. J. Beresford (Regional Lab.).
Secretary: Mr. J. Hill (Regional Lab.).
Treasurer: Miss J. Adams (Regional Lab.).

South Australian Branch

Chairman: Mr. N. Buchley (Biochemistry).
Secretary: Mr. J. Pickering (Soils).
Treasurer: Mr. B. Belling (Biochemistry).

A.C.T. Branch

Chairman: Mr. R. McInnes (Entomology).
Secretary: Mr. J. Deans (Plant Industry).
Treasurer: Mr. A. Axelson (Plant Industry).

Queensland Branch

Chairman: Mr. R. Waite (Tropical Pastures).
Secretary: Mr. R. Panitz (Tropical Pastures).
Treasurer: Mr. J. Coote (Tropical Pastures).

Victorian Branch

Chairman: Mr. J. Little (Fodder Conservation).
Secretary: Miss M. Seels (Building Research).
Treasurer: Mr. W. Stark (Dairy Research).

New South Wales Branch

Chairman: Mr. L. Clague (Radiophysics).
Secretary: Mr. J. Corcoran (Coal Research).
Treasurer: Mr. N. Bryant (Physics).

Council hopes that both non-financial as well as financial members will take advantage of this list with a view to giving financial support as well as moral support to the Association.

It is only with 100 per cent. membership that we can expect to gain maximum benefits for Technical Staff.

This Month's Overseas Travellers

Dr. R. D. Brock, of the Division of Plant Industry, recently visited Rome where he delivered a paper to the 3rd International Conference on the Peaceful Use of Atomic Energy. Before returning to Australia he discussed irradiation techniques with geneticists in India.

Dr. O. H. Frankel, of the Executive, left last month to represent the Australian Academy of Science at a meeting in Paris of the International Council of Scientific Unions to discuss the International Biological Programme, and a meeting of the International Union of Biological Sciences in Prague. Dr. Frankel will also attend the International Botanical Congress in Edinburgh, before returning to Australia via the U.S.A.

Dr. F. F. Gardner, of the Division of Radiophysics, left last month for Europe, the U.K. and the U.S.A., where he will visit observatories concerned with measurement of the polarization of radio sources. Dr. Gardner will be away for six months.

Mr. H. A. Haantjens, of the Division of Land Research and Regional Survey, left Australia recently to visit research institutes in Africa, Europe, North America, the West Indies, Japan and Malaysia, where he

will study recent developments in land use classification and soil survey work. He will be away for a period of six months.

Dr. P. E. Madge, of the Division of Land Research and Regional Survey, left Australia recently to visit research centres in Africa before travelling to London to attend the XIIth International Congress of Entomology. Dr. Madge will return to Australia via the U.A.R., Israel, India and Ceylon.

Dr. J. A. Mills, of the Division of Biochemistry and General Nutrition, left last month to visit Europe, the U.K. and North America. Dr. Mills will attend the International Symposium on Carbohydrate Chemistry at the University of Münster. He will be away for three months.

Dr. E. H. Ramshaw, of the Division of Dairy Research, has left Australia for the U.S.A., the U.K. and Europe to study problems of the use of casein in the food industry. He is to attend a meeting of the American Dairy Science Association at Tucson, U.S.A., and the Gas Chromatography Symposium at Brighton, U.K. Dr. Ramshaw will be away for three months.

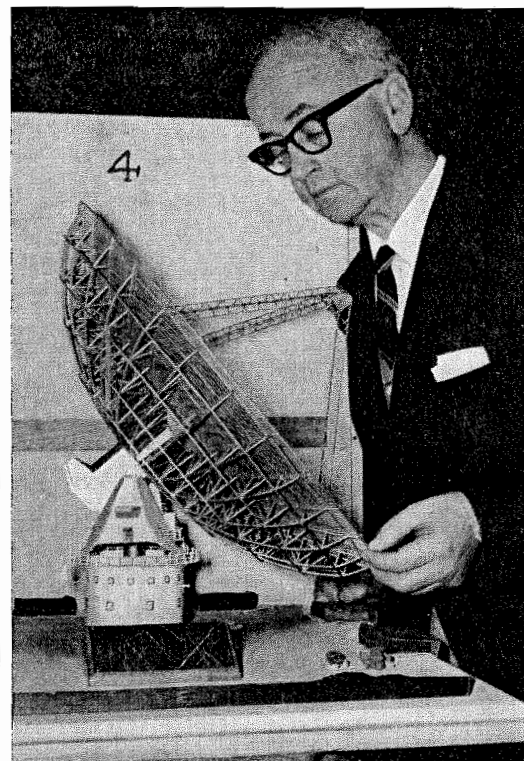
Mr. G. M. Stiff, of the Division of Chemical Physics, is

at present in the U.S.A. visiting research institutes before leaving for the U.K. and Europe. Mr. Stiff will return to Australia later this month.

Mr. A. J. Watson, of the Division of Forest Products, left Australia in June for Europe and North America, where he will visit pulp and paper research institutes. He will also attend the International Symposium on Lignin, Cellulose and Hemicellulose at Grenoble, a meeting of the American Chemical Society at Chicago, and the Mechanical Pulping Symposium in Vancouver.

Mr. L. G. Wilson, Assistant Secretary, left last month for the U.K., where he will attend the Administration and Management of Research and Development course at Cambridge. He will also visit universities and research organizations in Europe, the U.S.A. and Israel. He will be away for six months.

Dr. M. E. Winfield, of the Division of Physical Chemistry, is at present in the U.S.A. where he will attend the International Symposium on Oxidations and Related Redox Systems at Amherst. Dr. Winfield will also visit the U.K., Europe, the U.S.S.R. and Japan.



MODEL FOR MOSCOW

The Australian Ambassador in Moscow, Mr. Stewart Jamieson, recently presented a model of the Parkes Radiotelescope to the Moscow Polytechnic Museum.

The model, which was made by the Institute of Applied Science of Victoria, was given in response to an earlier gift of two model jet airliners which the Moscow Museum presented to the Institute in 1961.

A reception to mark the presentation was attended by V. A. Kirilin, Vice-President of the Academy of Sciences and the Director of the Museum, G. P. Kozlov.

Kirilin and Kozlov both emphasized the value of contact with scientific organizations and the need for further expansion of such contact between Australia and the U.S.S.R.

A number of Soviet reporters and photographers attended the function and a brief film of the reception was shown on Moscow television that evening.

Our picture shows the Director of the Victorian Institute of Applied Science, Mr. R. H. Fowler, with the 2 foot high model.

MEAT BOARD APPOINTMENT

Dr. M. C. Franklin, of the Division of Animal Physiology, has been seconded to the Australian Meat Board as Executive Officer of the Australian Cattle and Beef Research Committee.

This committee uses the funds provided by a levy on cattle slaughtered — matched by money from the Commonwealth Government — for cattle and beef research.

Dr. Franklin will assist the Committee in assessing the relative value to the beef cattle industry of research projects proposed or being undertaken with finance provided by the Committee.



Dr. M. C. FRANKLIN

He will also be responsible for implementing the Committee's decisions.

Dr. Franklin obtained his M.Sc. from the University of New Zealand in 1927 and his Ph.D. at the University of Cambridge in 1933.

He joined CSIRO in 1939 and has worked mainly in the fields of animal nutrition and drought feeding.

ARCHIVIST

Sir George Currie has been engaged by the Executive as consultant on the development of CSIRO archives.

At some future date it is hoped that the papers collected by Sir George will provide an historian with suitable material for writing a history of the Organization.

Sir George, a former Vice-Chancellor of the University of Western Australia, was a member of the Division of Plant Industry staff from 1929 to 1939.

He is at present enquiring into the formative years of the original Advisory Council for Science and Industry.

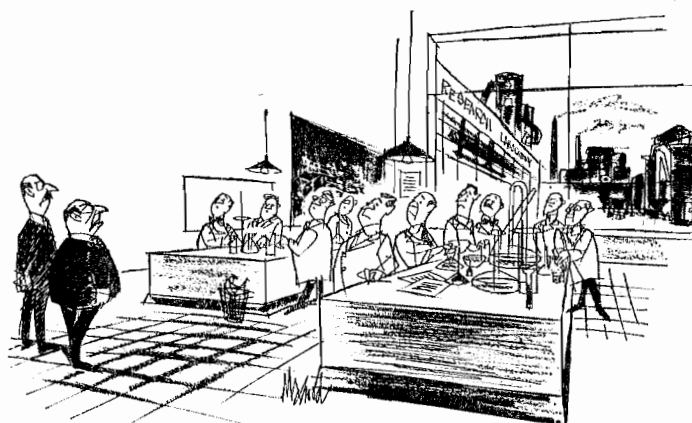
Sir George would appreciate any suggestions or information as to the location of any early historical documents relating to the early history of the Organization, or its personalities, which may be held in private collections.

Any correspondence should be addressed to Sir George Currie, c/- The Chairman's Office, CSIRO, P.O. Box 109, Canberra, A.C.T.



"As soon as I heard that 'Eureka'! I knew somebody had received an offer from America."

THE BRAIN DRAIN — COMMENT BY PUNCH



"Let's have it straight, men. Who was humming 'The Star-Spangled Banner'?"

Copyright, LONDON PUNCH

New Appointees

Dr. B. J. Austin has been appointed to the Computing Research Section. Dr. Austin graduated B.Sc. in 1958 from the University of Otago, New Zealand and obtained his M.Sc. from that University in 1959. He recently obtained his Ph.D. at the University of Cambridge.

Mr. C. E. G. Bennett, a recent science graduate of the University of Western Australia, has been appointed to the Division of Applied Mineralogy where he will assist in research in the field of mineral-organic complexes.

Mr. D. E. Boyd has joined the Editorial and Publications Section. Mr. Boyd, who graduated B.Sc. from the University of Melbourne in 1961, has been working with the Victorian Department of Lands and Survey in the Research Section of the Vermin and Noxious Weeds Control Board.

Mr. B. M. Brown has joined the Division of Mathematical Statistics. He will be stationed at the National Standards Laboratory where he will assist



Mr. B. M. BROWN

in the design and analysis of experiments. Mr. Brown graduated B.Sc. (Hons.) from the University of Melbourne in 1963.

Mr. P. R. Cary has joined the Irrigation Research Laboratory where he will assist in research concerned with wine grape quality and the response of vines to irrigation. Mr. Cary,



Mr. P. R. CARY

a Science graduate of the University of London, has been working with the N.S.W. Department of Agriculture as a fruit quality chemist.

Mr. D. J. Cole has joined the Division of Radiophysics where he will carry out a programme on research in radio astronomy. Mr. Cole graduated B.E.E. (Hons.) from the University of Melbourne in 1941 and was previously employed by CSIRO at the Division of Electrotechnology from 1941 to 1948. From 1948 to 1953 he worked with the Department of

Technical Education and the University of N.S.W. He spent a year as visiting assistant Professor at the University of Illinois, U.S.A., in 1954, and on his return to Australia became lecturer in Electrical Engineering at the University of N.S.W. For the past year he has been on sabbatical leave, which he spent at the Australian National Radio Astronomy Observatory, Parkes.

Mr. W. B. Elder has joined the Division of Mechanical Engineering where he will develop design techniques for aeration systems in grain silos. Mr. Elder, who holds the Diploma of Mechanical Engineering of the Gordon Institute of Technology, was awarded a three year Federation of British Industries Scholarship in 1957 to the U.K. Since his return to Australia in 1960 he has worked with the International Harvester Company of Australia.

Mr. W. O. Jones has joined the Division of Animal Health where he will assist in research into biochemical aspects of



Mr. W. O. JONES

parasitology. Mr. Jones graduated B.Sc. from the University of Sydney in 1955 and has been working as a biochemist with the Royal North Shore Hospital, Sydney.

Miss J. Lockhart has joined the Division of Animal Genetics, where she will assist in the virus research programme. Miss Lockhart, who graduated B.Sc. from the University of Tasmania in 1963, has been working with Cadbury, Fry-Pascall Pty. Ltd. as an analytical chemist.

Dr. W. B. McGlasson has joined the Division of Food Preservation where he will undertake research on the physiology of fruits after



Dr. W. B. MCGLOSSON

harvesting, especially in relation to disorders occurring during ripening and storage. Dr. McGlasson graduated B.Ag.Sc. from the University of Adelaide in 1951. He has worked with the South Australian Department of Agriculture since 1951 as a horticultural research officer, but spent the years 1959 to 1962 at the University of California where he obtained his Ph.D.

BIG WIN FOR BOWLING TEAM



Tension was high and expressions rapt as members of the CSIRO and Department of Immigration bowling teams watched the vital bowl with which CSIRO won the Public Service Pennant last June. The Pennant is the most widely sought after sporting trophy in the Public Service and some forty-two teams competed for it. This was the first time that CSIRO has won the competition, which has been going for thirty-five years. The CSIRO team members were all from the Division of Plant Industry and were captained by Dr. C. Barnard. Our picture shows, from right to left, Mr. E. Dowling, Mr. J. Shannon and Mr. G. Lemon with members of the Department of Immigration team.

Dr. K. G. McLaren has been appointed to the Division of Coal Research as Scientific



Dr. K. G. McLAREN

Assistant to the Chief. Dr. McLaren graduated B.Sc. in 1960 and M.Sc. in 1960 from the University of N.S.W. and obtained his Ph.D. at the University of Cambridge in 1962. He has been working at the Defence Standards Laboratories of the Department of Supply since 1958, but from 1960 to 1962 he was seconded to the Cavendish Laboratory at Cambridge.

Mr. I. G. Morgan has been appointed to the Division of Applied Physics where he will



Mr. I. G. MORGAN

conduct research on high voltage techniques and the be-

haviour of insulating materials under high voltage conditions. Mr. Morgan, who graduated B.Sc. from the University of London in 1950, has been working since 1951 with the Central Electricity Board, Leatherhead, U.K., where he led a research group studying problems in the field of power transmission and distribution.

Dr. N. S. Parker has joined the Division of Food Preservation where he will conduct and supervise research on the re-



Dr. N. S. PARKER

lationship between rheological properties of foods and the factors determining their quality. Dr. Parker graduated B.Sc. from the University of Durham in 1951 and obtained his Ph.D. at the same University in 1954. From 1954 to 1957 he worked with the U.K. Atomic Energy Authority and since then has been working with Rowntree and Company, U.K., as a research physicist.



Mr. E. SUZUKI

Mr. E. Suzuki has been appointed to a fellowship in the Division of Protein Chemistry where he has been working as an International Award Fellow since 1963. He will assist in research on the structure of fibrous proteins, peptides, and amino acids, before and after chemical modification. Mr. Suzuki graduated B. Engineering from Yokohama National University in 1955 and worked previously with the Textile Institute of Japan.

Mr. F. A. Sweet has been appointed to the Division of Chemical Engineering where he will undertake fundamental and applied research in various fields of physical chemistry. Mr. Sweet, who graduated B.Sc. from the University of London in 1942, has been working since 1945 with the U.K. Department of Scientific and Industrial Research at their Fuel Research Station and the Warren Spring Laboratory. From 1955 to 1957 he was seconded to the University of London to work with Sir Eric Rideal.

Dr. B. M. Thomas has been appointed to the Division of Radiophysics where he will conduct research in radio-astronomy. Dr. Thomas, who



Dr. B. M. THOMAS

graduated B.Eng. (Electrical) in 1960 and M.Eng.Sc. in 1961 from the University of Melbourne, obtained his Ph.D. at the same university this year.

Printed by CSIRO, Melbourne

CORESEARCH

FOR CIRCULATION AMONG MEMBERS OF CSIRO STAFF — NUMBER 66, MELBOURNE, SEPTEMBER 1964

£19¼m. for CSIRO

CSIRO will have a total Budget for 1964/65 of £19,252,800 for capital and non-capital items of which £15,230,500 will be provided from the Treasury, £2,694,300 from the Wool Research Trust Fund and £1,328,000 from contributory sources.

Treasury Funds

Of the amount of £15,230,500 to be provided by the Treasury, £12,100,000 is for non-capital and £3,130,500 for capital expenditure.

The non-capital allocation represents an increase of £1,500,000 (about 14%) over that available for 1963/64.

However, salary commitments arising from increments and adjustments to a number of wage awards, including Research Scientists, Scientific Services Officers, and technical and ancillary staff, will absorb £817,000 (almost 55%) leaving £683,000 for other non-capital purposes.

Of the latter amount the Executive had to provide a substantial sum (£349,000) to meet commitments concerned with:

- Cabinet decisions relating to the Computing Research Section, the Pasture Research Laboratory at Townsville, and leather research.
- Increases in grants and studentships.
- The transfer to new premises of the Divisions of Chemical Physics and Mineral Chemistry, and the Regional Administrative Offices at Sydney and Canberra.

The remaining £334,000 of the additional funds received for non-capital purposes has been used by the Executive:

- To raise maintenance provisions to more adequate levels.
- To provide for increases in travelling, casual labour, and overtime.
- To increase the equipment allocations for some Divisions, particularly for items costing less than £5,000.

Apart from the additional positions granted for the new activities of the Computing Research Section and the Pasture Research Laboratory at Townsville, the Executive has been allocated sufficient positions to cover definite commitments and to allow for the establishment of a small positional "pool".

The capital allocation from the Treasury is divided into two categories—those controlled by CSIRO and those handled by the Department of Works and the Department of the Interior.

The first group absorbs £2,035,000, the major share (£1,500,000) of which, is to provide for the computer network which will come into operation during October.

The balance is to cover the final payment on the radio-telescope, the purchase of major items of equipment costing over £5,000, and the replacement of obsolete items of equipment costing over £5,000.

Almost four-fifths of the funds allocated for projects under the Department of Works (£1,073,000) will be needed for buildings under construction.

These include the Chemical Physics Laboratory, Clayton; the Poultry Research Unit, North Ryde; the workshop building for the Division of Plant Industry, Canberra; and the accommodation for the Computing Research Section at Canberra, Sydney and Melbourne.

Major buildings to be commenced during 1964/65 include the Western Australian Regional Laboratory, acoustic reverberation chambers for the Division of Building Research, and laboratory accommodation for the Division of Mineral Chemistry.

An amount of £22,500 has been provided in the vote of the Department of Interior for the acquisition of sites and buildings for CSIRO during 1964/65.

Wool Funds

The Executive hopes to obtain from the Australian Wool Board (the body controlling wool research funds) an allocation of £2,694,300, comprising £2,490,000 for non-capital and £204,300 for capital expenditure.

The allocation of £2,490,000 for non-capital items represents an increase of £343,300 (about 14%) over the sum available for 1963/64.

Here again a substantial sum (£218,000) is absorbed in increased salaries expenditure resulting chiefly from the numerous wage adjustments which became effective during 1963/64.

The Board has been asked to allocate 39 new positions

BIG GRANT FOR FOUNDATION

The Chairman of the Board of Governors of the Ian Clunies Ross Memorial Foundation, Sir Owen Dixon announced last month that the Foundation had received a grant of £100,000 from the Wolfson Foundation of London.

The grant brings the total money now available to the Foundation to more than £400,000.

The Foundation, which was established several years ago to commemorate the late Sir Ian Clunies Ross, has as its Patron His Royal Highness the Duke of Edinburgh.

The Foundation plans to build a five-storey building in Melbourne, to be known as Clunies Ross House, which will house the National Science Centre.

The grant from the Wolfson Foundation will be used to build and furnish the associated conference facilities to serve the National Science Centre.

The Director and Secretary of the Wolfson Foundation said that the Trustees appreciated both the national and international importance of the proposed Science Centre and were extremely happy to be associated with the project.

Sir Owen Dixon said that this tribute from overseas was most encouraging to the Governors of the Ian Clunies Ross Memorial Foundation and was a significant indication of the importance of the proposed Centre.

The Wolfson Foundation of London was founded nine years ago by Sir Isaac Wolfson, Chairman and Managing Director of the Great Universal Stores Limited of England, to advance education and health in the United Kingdom and Commonwealth.

Since its establishment it has made grants totalling some £9,000,000.

which will permit limited expansion of some research projects.

The balance of the increased allocation of wool funds is being used to raise the provisions for travelling, equipment and maintenance.

The expected allocation (£204,300) for capital items is £107,300 less than the previous year.

Textile machinery, plant and developmental expenditure will absorb £104,300 leaving £100,000 for several building projects including the completion of the Virology Laboratory at Maribyrnong for the Division of Animal Health, and the commencement of stage 2 of the Mill building at Ryde for the Division of Textile Physics.

Contributory Funds

Increased funds to the extent of £209,100 are available from contributory sources which will enable expansion to take place in some fields.

Some two-thirds of this increase is for capital expenditure; the remainder is for non-capital items.

The major capital project to be financed from contributory sources is the radio-heliograph at present under construction at Narrabri for the Division of Radiophysics.

There is also a substantial sum (£131,335) available from the Cattle and Beef Research Trust Account for capital expenditure.



Above. Mr. J. Cummins, Executive Officer and Treasurer of the Ian Clunies Ross Memorial Foundation, shows the Trust Secretary, Mr. G. B. Gresford, the letter from the Wolfson Foundation advising of the £100,000 grant.

BIGGER LOANS LIKELY

At a special meeting to be held at Head Office on Wednesday, 9th September, the Directors of the Credit Society will recommend to shareholders that approval be given to extend the loan maximum to £2000.

At present the loan maximum is £1,000, repayable over a period of 5 years. If this recommendation is approved by the shareholders, the

Directors will accept applications for loans of up to £2,000.

It is envisaged that such loans would be in the nature of first mortgage loans, but other applications would be considered, provided adequate security was available to support the loan, e.g. a lien on superannuation payments of nearly this amount.

Such loans would be repayable over a maximum period of 10 years, and repayments would be at the rate of about £11 a fortnight.

The Directors have arranged for a "disability cover", as well as the already existing "death indemnity cover", to protect borrowers for shorter term and the proposed longer-term loans.

This cover is designed to safeguard not only the borrower in the event of his or her premature retirement from active duty due to sickness, but also the investor in the Society.

The cost of such cover, as with the death indemnity cover, will be met by the Society.

In anticipation of the demands which would be made on the Society's resources if this recommendation is acceptable to shareholders, the Society is happy to accept further deposits from investors.

The attractive investment rate of 6% is offered to these investors, and money is repayable virtually on call.

OBITUARY

Miss Joyce Hardy, of the Translation Section, died suddenly on the night of 11th August, in Brisbane, where she was temporarily stationed at the Division of Tropical Pastures.

Miss Hardy came to the Translation Section in 1957 from the Defence Standards Laboratories. Except for six months at the National Standards Laboratory, Sydney, in 1960, and her recent temporary transfer to Brisbane, she was stationed at Head Office.

She obtained her B.A. at the University of Melbourne in 1948, with first-class honours and the Final Prize in Germanic Languages.

To Dutch, German and French she added, after graduation, Russian, Swedish, Danish, Norwegian, Italian, Spanish and Portuguese.

She possessed the abilities required of a scientific translator in outstanding measure, together with a cheerful and attractive personality.

Her sudden death at a comparatively early age is a heavy loss to all who knew her.

APPOINTMENTS VACANT

The following vacancies for professional appointments are current:

EXPERIMENTAL OFFICER (E.O. 1/2)—Division of Applied Physics, 750/297 (25th September).

EXPERIMENTAL OFFICER (E.O. 1/2)—Division of Protein Chemistry, 462/205 (11th September).

EXPERIMENTAL OFFICER (E.O. 1/2)—Division of Protein Chemistry, 462/206 (11th September).

EXPERIMENTAL OFFICER (E.O. 1/2)—Division of Tribophysics, 370/151 (11th September).

RESEARCH SCIENTIST (R.S./S.R.S.)—Division of Fisheries and Oceanography, 320/297 (4th September).

Funds available to CSIRO for 1964/65			
	Non-Capital £	Capital £	Total £
Treasury funds ..	12,100,000	3,130,500	15,230,500
Wool funds ..	2,490,000	204,300	2,694,300
Contributions ..	1,021,800	306,200	1,328,000
Total ..	15,611,800	3,641,000	19,252,800
Funds available to CSIRO for 1963/64			
	Non-Capital £	Capital £	Total £
Treasury funds ..	10,600,000	1,806,000	12,406,000
Wool funds ..	2,146,700	311,600	2,458,300
Contributions ..	945,900	173,000	1,118,900
Total ..	13,692,600	2,290,600	15,983,200
Funds available for 1964/65 compared with 1963/64			
	Non-Capital £	Capital £	Total £
Treasury funds ..	1,500,000	1,324,500	2,824,500
Wool funds ..	343,300	107,300	450,600
Contributions ..	75,900	133,200	209,100
Total ..	1,919,200	1,565,000	3,484,200

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AUSTRALIAN-MADE GAS LASERS

One of science's newest tools, the continuous-wave gas laser, has been developed on a commercial basis by Australian research scientists. Only five years ago the idea of producing a laser was the subject of speculation among scientists around the world.

Now an Adelaide company, Scientific Optical Laboratories Pty. Ltd., is marketing a portable continuous-wave laser.

This commercial model was developed by the company in collaboration with research workers at the Division of Physics.

It was only in 1960 that the first laser was built by an American scientist, Dr. Theodore Maiman.

So now is the laser that only a limited range of applications have been developed for it.

Some suggested uses include "death-ray" guns and communication beams.

The Australian laser has been designed for the needs of universities and other teaching institutions.

It sells for about half the price of imported instruments.

A laser produces a beam of light with special characteristics. The name stands for "light amplification by the stimulated emission of radiation".

Lasers are a development from a device known as a maser ("microwave amplification by stimulated emission of radiation"), which appeared on the scientific scene in 1955.

Light waves and microwaves are basically similar in character.

It was realized that the maser idea might be extended into the shorter wavelengths and higher frequencies of infra-red radiation and visible light.

Following this line of research, by 1960 Dr. Maiman had developed the first laser, with a rod of synthetic ruby as the essential optical element.

This gave bursts of light of high energy but of exceedingly short duration.

The light generating ability of the ruby rod is based on its unique characteristic of releasing absorbed energy as light of a single wave length.

In operating the laser, stored electrical energy is discharged into the ruby rod through a



Above. Dr. J. V. Ramsay of the Division of Physics with a continuous-wave helium-neon laser.

flash lamp wrapped spirally around it. This flash lamp is similar to the flash tubes used in high-speed photography.

Much of the light energy released by the flash is absorbed by the atoms of the ruby.

The intensity of the laser beam is amplified by bouncing the light back and forth between reflecting surfaces on the ends of the ruby crystal until all of the stored energy is released.

As the light generated by the ruby builds up to a critical level a portion of it bursts through the partially reflecting surface at the end of the ruby.

The beam emitted is very narrow and spreads only slightly, even over relatively long distances.

Production of the beam takes less than four-thousandths of a

second from the switching on of the flash lamp.

Dr. Maiman's laser, with its solid-state ruby element, can only be operated discontinuously.

From the time of its appearance in 1960, much research was undertaken throughout the world into methods of producing continuous operation lasers.

The first group to achieve continuous operation was the Bell Telephone laboratories.

In 1961 they reported the operation of a laser with a mixture of the gases helium and neon as the working material.

It produced infra-red radiation and further research by Bell Telephone led to the production of helium-neon lasers giving an output of red light.

A laser of this type, built in 1962 by a group in the Division of Physics led by Dr. J. V. Ramsay, was the first gas laser to operate in Australia.

The light from a gas laser is produced in a way that gives it special characteristics.

In the helium-neon laser, the mixture of gases is held in a narrow silica tube.

Outside the tube at each end is a mirror which reflects a high proportion of the light falling on it.

An electric discharge raises the energy of helium atoms and some of these transfer energy to neon atoms by colliding with them.

This results in the production of a large number of excited neon atoms capable of emitting radiation.

Some of the excited atoms emit radiation spontaneously. This radiation can stimulate other excited neon atoms to emit.

Radiation emitted along the tube is reflected by the mirrors and passes through the gas again, stimulating further emission.

Thus radiation along the axis builds up to a high intensity and some of it passes through

TECHNICAL ASSOCIATION NEWS

At the moment there are a number of items being discussed at Council and Head Office which are of interest to all members.

Our Association must form a policy on our attitude towards "negligent driving" of CSIRO vehicles. This matter is under discussion at the moment and the Branch Secretaries would welcome helpful suggestions from members, especially as to responsibility for a decision on "negligent". We have for some time shown concern over Technical Staff driving CSIRO vehicles and hope that this matter will be resolved shortly.

Another item under discussion by Council and Branches is the suggestion that the next Council-in-Person Meeting be held in Sydney followed by the President and General Secretary spending a day at Head Office to resolve the items concerned. In this matter, the reduction in the cost is quite large; however, it will be a matter for the Branches to decide.

By the time this issue is read our "Gazette" will again be distributed. For the first time the Editor has had an excess of copy. Fortunately the articles held over will still be relevant to the next issue. We hope that members will find this issue of sufficient interest to write to the Editor with comments and/or contributions.

Also by the time this goes to print the General Secretary will be visiting the Brisbane area and expects to see most of the laboratories and all of our members. Possibly a report of the General Meeting proposed for this visit may be included in the next issue of "Coresearch".

It is pleasing to note that the "CSIRO Laboratory Craftsmen" Association has been duly constituted and has just completed its elections. Council wishes the Association smooth sailing on an often turbulent sea.

Council expects to have the reports from two sub-committees available to Branches shortly. They are the Certificate sub-committee and the Constitution sub-committee. The reports from both will require full consideration from Branches. Whilst Certificates may not be as important in some States as in others, the Constitution of our Association is important to all members and they should peruse the proposals fully. It is hoped that we can issue a large number of copies to each Branch.

In conclusion, would any member who desires further information on these or any other items, please contact the respective Branch Secretaries or the General Secretary. They are listed in last month's "Coresearch".

the mirrors, forming the output beam.

One of the most promising possibilities for the use of continuous wave lasers is in communications, since the laser beam has an information carrying capacity enormously greater than radio waves because of its higher frequencies.

Some use has already been made of laser beams in the testing of optical components and the alignment of complex optical instruments.

Other possible applications are in accurate length measurements and in establishing extremely precise standards of frequencies.

News in Brief

Lectureship

Dr. J. A. Beattie of the Division of Soils in Canberra has been appointed senior lecturer in soil science in the Faculty of Agricultural Science of the University of Tasmania.

Opening

The Computing Research Section's Canberra laboratory will be officially opened by Sir John Cockcroft, O.M., K.C.B., C.B.E., F.R.S., on the 17th September, 1964.

The opening will be attended by the Minister-in-Charge of CSIRO Senator Gorton, the Executive, Advisory Council members, Chiefs and Officers-in-Charge of Divisions and Sections, representatives of universities, Government Departments, and members of industry.

Visitor From France

Monsieur André Maréchal, who is Délégué Général of the Délégation Générale à la Recherche Scientifique et Technique and principal adviser to President De Gaulle on scientific matters, visited Australia last month.

The prime purpose of Monsieur Maréchal's visit was to attend the International Commission for Optics Conference in Sydney which was organized by the Australian Academy of Science.

Monsieur Maréchal also visited Canberra where he met with members of the Executive, and was also a guest of the Division of Plant Industry, where he inspected the controlled environment research laboratory.

R.O.'s By Any Other Name

As from 3rd August the various designations of Research Officer have been changed to Research Scientist.

Visitor From London

Mr. W. Hartley, Chief Scientific Liaison Officer, London, will visit Australia in October and November.

This will be the first time Mr. Hartley has been back to Australia since he was appointed Scientific Attaché, Washington, in 1961.

During his stay in Australia, Mr. Hartley will meet for discussions in Melbourne with the Executive and the Secretariat.

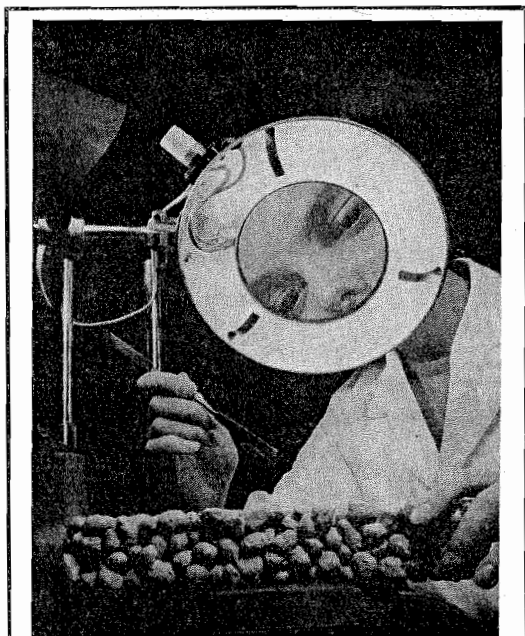
He will also visit Divisions in Melbourne, Canberra, Sydney, and Brisbane before returning to London via the U.S.A.

Committee Member

Dr. H. R. Dadsell, Chief of the Division of Forest Products, has been nominated as the CSIRO representative on the Standing Committee on Forestry of the recently formed Australian Forestry Council.

The members of the Council are the Minister for National Development, the Minister for Territories, and the Ministers responsible for forests in the States.

The Standing Committee on Forestry, which will support the Council, consists of the Heads of the various State and Commonwealth Forest Services and representatives of Commonwealth Departments having a responsibility for forestry matters.



"Macroscopic examination of no-fines light-weight aggregate concrete" is the formal title of this informal study of Miss Maureen Feels of the Division of Building Research. The Division's photographer Mr. Eric Smith is responsible both for the photograph and the title.



Cambridge Cox Pays Us A Visit

Mr. Robert Stanbury, who coxed the Cambridge crew to victory in this year's boat-race against Oxford, is spending three months with the Division of Mechanical Engineering in Melbourne.

Mr. Stanbury is an honours student in Mechanical Sciences at Cambridge University and hopes to graduate next year.

He is one of a group of one hundred and nineteen English undergraduates working in Australia during their summer vacations under a scheme sponsored by the Inter-University Australia Committee.

The students each paid £150 towards their trip which has been subsidized by the Australian Government and by British and Australian industry.

The scheme was begun two years ago to foster understanding between Britain and Australia.

The organizers of the scheme

MOBILE FIELD CONFERENCE IN NORTH

Last month a group of sixteen scientists and engineers from the U.K., South Africa, U.S.A. and Australia met in Darwin to discuss the use of terrain evaluation methods in the engineering development of underdeveloped areas.

There is widespread interest throughout the world in the physical interpretation of terrain features for both agricultural and engineering development.

Australia was represented at the meeting by Mr. C. S. Christian of the Executive, and officers of the Division of Land Research and Regional Survey, the Division of Soils, and the Soil Mechanics Section.

Following the discussions in Darwin, the Conference delegates travelled by bus through the Northern Territory and northern Queensland to Cairns, accompanied by supporting staff and four other vehicles.

The methods of terrain classification which have been developed by the Division of Land Research and Regional Survey and applied in these areas, were presented and discussed and compared with the systems used in other countries.

The object of the conference was to facilitate the development of a useful system of terrain classification as an aid to the planning design and construction of roads, airfields, and other engineering structures in underdeveloped areas.

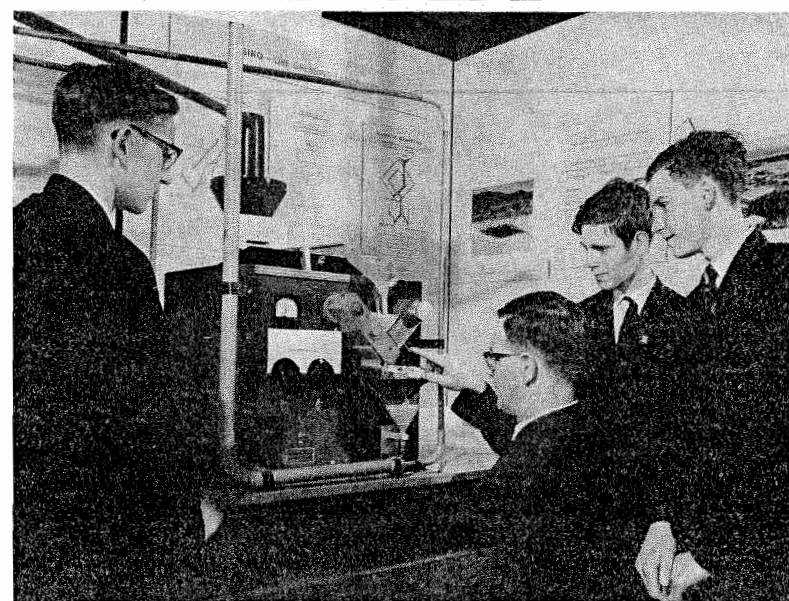
hope that the students will like Australia so much that they will return here on a permanent basis.

The Royal Commonwealth Society has assisted with accommodation for the students and has arranged various social functions for them.

While in Australia, Mr. Stanbury is attached to the

Division's Solar Energy Group, where he is working on the design of a suitable air flow meter in a solar air conditioning cycle.

Our picture shows him chatting with Victorian 2,000 metres sculling champion Ron Willis on the banks of the River Yarra in Melbourne.



the work has special significance or value to Australia, or is connected with some aspect of Australian life.

Each nomination should be accompanied by a citation justifying the nominee's claim for consideration by the Committee with reference to his principal achievement or field of achievement.

A list of the nominee's publications should also be included, with an indication of those specially relevant to the citation.

Twelve typewritten copies of each nomination and supporting material should be lodged with the Chairman of the Committee, C/- The Australian National University, Box 4, P.O., Canberra, A.C.T., on or before 25 September, 1964.

The Committee will not consider nominations made by any person on his own behalf.

Britannica Awards

Encyclopaedia Britannica Inc. has established a scheme of awards in Australia in recognition of outstanding contributions associated with Australia in the fields of Art, Education, Literature, Medicine and Science.

The Award in each nominated field will be made for a contribution or development of outstanding merit originating in Australia, or having direct connection with or benefit for Australia.

Each Award will consist of a gold medal, a diploma bearing a citation and £5,000.

The Committee for the Natural and Applied Sciences is concerned with the following disciplines — Physics, Chemistry, the Applied Sciences, Mathematics and Biological Sciences, and invites nominations of persons who have made outstanding contributions of the kind described above and of contemporary importance.

The Award is open to scientists whose relevant work has been carried out mainly in Australia. It is also open to Australians whose relevant work has been done mainly abroad, provided in these latter cases that

SCIENCE EXHIBITION

CSIRO was one of the main exhibitors in the "Science in the Development of Australia Exhibition" which was held in Melbourne from 7th to 15th August.

The exhibition, which was arranged by the Science Teachers' Association of Victoria to mark the Association's 21st anniversary, was attended by more than 70,000 people.

It was held in conjunction with the Association's 13th

Annual Science Talent Search.

The CSIRO stand, which occupied an area of 25 feet by 50 feet, featured nine displays from six Melbourne divisions and sections.

The Division of Dairy Research demonstrated the separation of milk proteins by gel filtration and the Division of Chemical Physics put on a display on atomic absorption spectroscopy.

The Division of Meteorological Physics showed how radiation, convection, and conduction could be measured and Ore Dressing Investigations featured a laboratory-sized electrostatic and magnetic separator recovering minerals from beach sands.

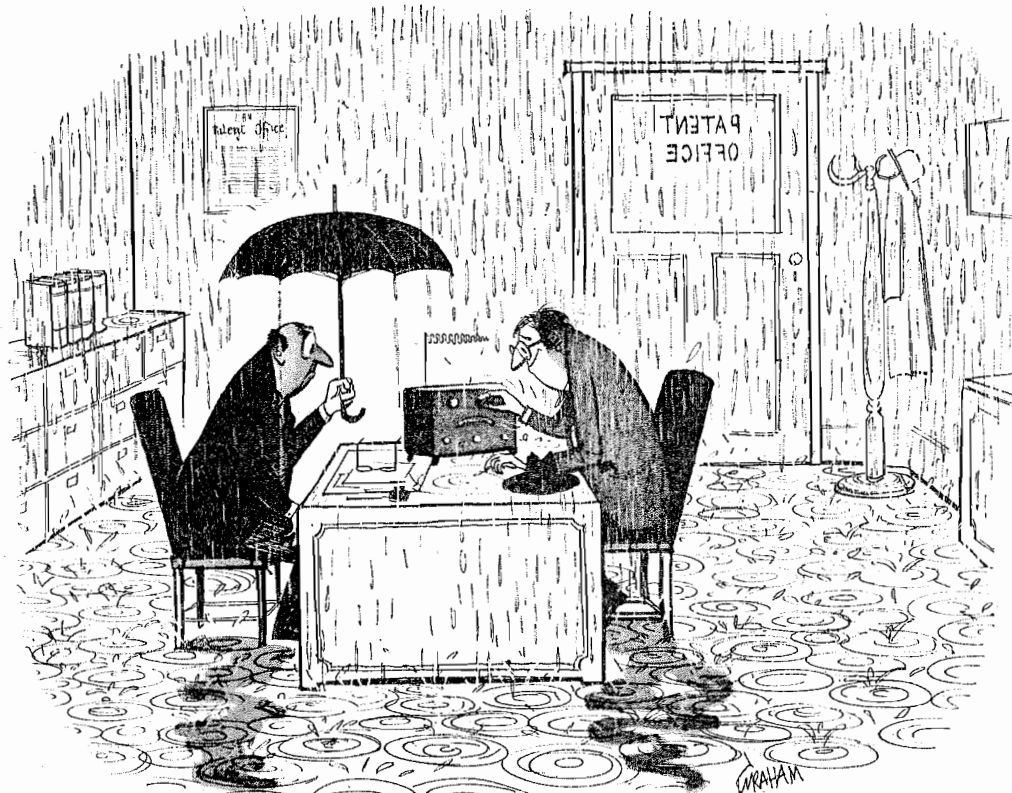
Two methods of obtaining fresh water from salt water—solar distillation and vapour compression distillation—were demonstrated by the Divisions of Mechanical Engineering and Chemical Engineering.

The Division of Mechanical Engineering also displayed one of the special cabinets designed for the Canberra phytotron, while the Division of Chemical Engineering had two other exhibits—the cyclosizer, and a fluidized bed reactor.

Left, Mr. S. Hudson of Ore Dressing Investigations demonstrates magnetic separation of beach sand minerals to a group of schoolboys.

Below, A general view of the CSIRO stand.





Copyright London Punch

OVERSEAS VISITS

Dr. B. Dawson, of the Division of Chemical Physics, left Australia recently for the U.S.A. He has been invited to participate in a specialist conference on "Charge and Spin Density", which will be held at the Syracuse University's Sagamore Conference Centre. Dr. Dawson will also visit the U.K. before returning to Australia later this month.

Dr. C. H. Gallagher, of the Division of Animal Health, left Australia recently for the U.S.A., the U.K. and Europe. In New York Dr. Gallagher will attend the International Congress of Biochemistry and in Paris the Fifth International Congress of Angiology. He will also spend two weeks at the Wenner Grens Institute in Stockholm, working with Professor Ernster on intracellular electron transport and oxidative phosphorylation. Dr. Gallagher will be away for five months.

Mr. A. F. A. Harper, of the Division of Physics, left recently for the U.S.A. where he will attend the 9th International Conference on Low Temperature Physics at Columbus, Ohio, and visit research centres before travelling to the U.K. and Europe. Mr. Harper will return to Australia via India, Thailand and New Guinea.

Mr. R. H. Riordan, of the Division of Mechanical Engineering, left last month for the U.S.A. where he will spend nine months working at the Department of Electrical Engineering of the University of California. Mr. Riordan will return to Australia via the U.K., where he will visit the National Physical Laboratory, Manchester University, and the London College of Science and Technology.

Dr. A. F. Reid, of the Division of Mineral Chemistry, left Australia recently for Europe where he will present a paper at the 8th International Conference on Co-ordination Chemistry at Vienna. After visits to research centres in

Italy, Germany, France and the U.K., he will travel to the U.S.A. where he will spend fifteen months at the Cornell University, Ithaca.

Mr. W. C. Swinbank, of the Division of Meteorological Physics, left last month for the U.S.A. where he will attend the Symposium of the International Ozone Commission of U.G.G.I. and also a conference of the Committee on Atmospheric Sciences of the National Research Council of the U.S. National Academy of Sciences. He will visit research centres in Canada before travelling to the U.K. and Europe.

Dr. A. W. Wylie, of the Division of Mineral Chemistry, left last month for Geneva where he will attend the 3rd United Nations Conference on Peaceful Uses of Atomic Energy. He will also attend the 8th International Conference on Co-ordination Chemistry at Vienna. Before returning to Australia he will visit research centres in the U.K. and North America.

WORLD RECORD

The Division of Protein Chemistry recently smashed the world record for breaking up a piano which was established earlier this year by Melbourne University students.

By carefully tipping a piano from a moving truck they bettered the world record of 2 minutes by 1 minute 58½ seconds.

The piano was being returned to the Head Office Social Club at the time, having been borrowed for the Protein Chemistry "Woolshed" Dance.

The Division established yet another record by rebuilding the piano and delivering it back to Head Office in better condition than when it was borrowed.

Members of the Social Club were among the first to congratulate the Division on their splendid achievement.

Premiere of Bird Film

The Film Unit's most recent production "Bird Banding in Australia" had its premiere at the I.C.I.A.N.Z. Theatre, I.C.I. House, Melbourne, on August 26th.

Some 70 guests, including representatives of Commonwealth and State Departments, naturalists and bird banders attended the premiere.

The film opens with a shot of Namjira, a mission aborigine spearing a magpie goose. On the bird's leg he finds a metal band.

The film then takes us back to the time when the bird was banded and shows how banding

helps biologists to collect information essential for the study and conservation of rare species and the control of pests.

Produced in collaboration with the Division of Wildlife Research, Government Departments, and bird banders, the film is intended for general screening and television to encourage the general public and school children in particular to report findings of banded birds.

WASHINGTON VACANCY

Any young stenographer planning a working holiday in the U.S.A. may be interested in the vacancy which exists at the Office of the Australian Scientific Attache in Washington for a Senior Stenographer.

Fares to and from Washington would be the responsibility of the individual and not the Commonwealth.

Mr. L. Peres, Acting Assistant Secretary at Head Office, would be pleased to hear from any CSIRO staff or friends of staff who may be interested in this post.

H'MM

"It is important to know whether an organoaluminium alkoxide exists as such in solution or as a mixture of trialkylaluminium and aluminium alkoxide, and under what conditions a trialkylaluminium and an aluminium alkoxide may be mixed to give an organoaluminium alkoxide."

"This kind of question has only been answered occasionally and often uncertainly in the past."

(Extract From CSIRO Annual Report 1963/64)

Research In Peace

The Division of Entomology has obtained a lease on the Townsville morgue for a further seven years to serve as a *piet-a-terre* for those of its officers engaged in research in northern Queensland.

A report that Head Office is currently negotiating a long term lease of the Canberra morgue has not yet been confirmed.

Meeting In Tonga

Dr. Nancy Burbidge of the Division of Plant Industry left last month for Tonga where she attended a conference of the Pan-Pacific and South-east Asia Women's Association.

Dr. Burbidge is the international secretary of the Association. The theme of the conference was the preservation of cultural heritage from the past to the present.

After the conference Dr. Burbidge attended a three day seminar in Fiji on the role of the P.P.S.E.A.W.A. in the field of education during the United Nations development decade.

Tick Research Field Station

A new field station for research into cattle tick control is being established at Jimboomba, on the Logan River, near Beaudesert in south-eastern Queensland.

The 1,000-acre site, to be known as Glenlogan Field Station, was purchased with funds made available by the Australian Cattle and Beef Research Committee.

It is hoped to start research work at the new property in about three months.

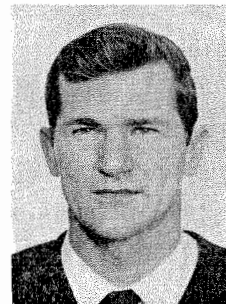
At present, cattle tick control, tick-borne cattle diseases and worm diseases in cattle are studied by the Division of Animal Health, at the veterinary laboratory at Yeerongpilly, Brisbane, and at the Amberley Field Station.

The Division plans to intensify its studies of tick problems and the Amberley Field Station is regarded as inadequate in area and facilities.

The Amberley Field Station will be used solely by the Division of Entomology when the new station is opened.

APPOINTMENTS TO STAFF

Mr. I. D. Martin has been appointed to the Division of Applied Mineralogy where he will assist in investigations of slag attack phenomena and the development of firing tech-



Mr. I. D. MARTIN

niques of high temperature refractories. Mr. Martin, a science graduate of the University of Western Australia, has been working for this Ph.D. degree at the Australian National University.

Mr. N. F. Clark has joined the Administrative staff at Head Office. Mr. Clark graduated B.Eng. (Civil) from the University of Queensland in 1961. He has been working as an engineer in the Queensland Department of Main Roads.

Miss K. Stocks has joined the Division of Coal research as Librarian. Miss Stocks is an Arts graduate of the University



Miss K. STOCKS

of Sydney and has been working as senior cataloguer at the Victoria University, Wellington, New Zealand.

Printed by CSIRO, Melbourne

COMPUTER LABORATORY OPENED

The Chancellor of the Australian National University, Sir John Cockcroft officially opened the Computer Laboratory in Canberra on Thursday, September 17. The new laboratory is the headquarters of the Computing Research Section and houses a Control Data 3600 computer.

This machine will be the central installation in CSIRO's £1½ million computing network and is the most powerful computer system in Australia today.

When completed, the network will include three smaller subsidiary Control Data computers at Sydney, Melbourne and Adelaide.

Although much of the work load for the basic network of computers will arise from CSIRO's own research work, the computing facilities will be available to other research workers.

The Computer Laboratory will be run on a service basis and it is expected that research workers from universities, the Atomic Energy Commission, the Bureau of Meteorology, the Aeronautical Research Laboratories, the Bureau of Mineral Resources, the Division of National Mapping, and the Ionospheric Prediction Service will be among those using the facilities.

The idea of a computing network goes back several years ago to when Australian scientists began realizing that a considerable expansion in computing facilities was needed in Australia.

Following a detailed study of the situation, CSIRO, in conjunction with the Australian Universities Commission, the Australian Atomic Energy Commission, and various other Commonwealth Departments, drew up plans for the best means of supplying computing facilities to meet both immediate and future needs.

A report was then submitted to the Commonwealth Government.

Since most research groups in Australia are located in widely separated capital cities it was considered necessary to avoid over centralization of computing facilities.

The report therefore called for the establishment of a computer network consisting of a large and powerfully equipped central computing system located at Canberra together with a number of smaller subsidiary systems located in Sydney, Melbourne and Adelaide.

The report also recommended that a group of people specialised in computing techniques should be established in Canberra to maintain and improve the facilities and to carry out basic research in computing methods and automatic data processing.

As a result of these proposals, the Commonwealth Government agreed in 1962 to provide

£1,500,000 for the establishment by CSIRO of a computing network for the use of scientists in CSIRO, universities, and Commonwealth Departments and Authorities.

Specifications for the computing equipment were prepared by a special committee



Sir JOHN COCKCROFT

of Australian scientists including representatives of the Atomic Energy Commission, the Australian Universities Commission, and CSIRO, under the chairmanship of Professor S. A. Prentice, Professor of Electrical Engineering at the University of Queensland.

Tenders were invited and the contract was awarded to Control Data Corporation of Minneapolis, U.S.A., for supply of a Control Data 3600 computer with a wide range of peripheral input and output devices for installation at Canberra. The contract also included three Control Data 3200 computers for installation at Adelaide, Melbourne and Sydney.

The subsidiary computers will be capable of handling most types of computing arising from scientific research work in Adelaide, Melbourne and Sydney areas. However, if problems become too big for them or if they become temporarily over-loaded, work will be transferred to the central computer.

One of the subsidiary 3200's has already been installed in the Adelaide University Civil Engineering Annex and is now in operation, while a second 3200 is being installed in the National Standards Laboratory in Sydney.

The third subsidiary computer will arrive in Melbourne this month and will be installed in the new laboratory which is being built for the Division of Chemical Physics near Monash University.

Salary Increase For Research Scientists

After protracted negotiations lasting nearly two years increases in salaries for research scientists have finally been approved by the Public Service Arbitrator.

The new scales, which are operative as from and including 21st April, 1964, are as follows:—

Research Scientist	£2260-2370-2480-2590*-2700-2810-2920
Senior Research Scientist	£3050-3180-3310*-3440-3570
Principal Research Scientist	£3700-3850-4000*-4150-4300
Senior Principal Research Scientist	£4505-4655
	* Efficiency Bar

The rates shown are nominal and are for men only. The salary rates for women are £154 less than the corresponding rates for men.

Nominal salary rates may be converted to actual rates by adding £185 in the case of men and £138 in the case of women.

The salaries of the designations above Senior Principal Research Scientists were not the subject of the Arbitration hearing and new salaries for these designations have been

introduced by the Executive by administrative act.

The new rates for these designations are:

Chief of Division Grade 1 or Chief Research Scientist Grade 1 £5,030.

Chief of Division Grade 2 or Chief Research Scientist Grade 2 £5,405.

Chief of Division Grade 3 £5,780.

Chief of Division Grade 4 £5,980.

The method of adjustment from the old scales to the new salaries prescribed by the Arbitrator for designations Research Scientist to Senior Principal Research Scientist was not the subject of debate in the hearing.

This matter was left to the respondents with recourse to the Arbitrator where necessary by the relevant Staff Associations.

However, at the time of going to press, finality had not been reached between the Executive and the Public Service Board.



Mr. Mboya Pays a Visit

During his recent visit to Australia, Kenya's Minister for Justice and Constitutional Affairs, Mr. Tom Mboya, visited the Division of Plant Industry where he saw some of the plant material collected in East Africa last year by a CSIRO team.

The plants are at present undergoing initial testing in Canberra in preparation for intensive selection, breeding and improvement at the Division of Tropical Pastures.

East Africa, which is at present experiencing a shortage of scientific staff to further its more intensive improvement work, will benefit in future years when Australia is able to return improved material to East Africa for rural development.

Mr. Mboya said he was keenly interested in the scheme of making available improved plant material because it tied in with extensive capital investments from Britain and the World Bank, which were concerned with the promotion of beef ranching schemes and the cattle industry in general.

Our picture shows Mr. Mboya with the Chief of the Division of Plant Industry, Dr. J. Falk.

INSTITUTE FELLOWS

Mr. W. W. Bryan of the Division of Tropical Pastures, Dr. T. J. Marshall of the Division of Soils, and Dr. N. S. Noble, who retired last year as Editor and Officer-in-Charge of the Editorial and Publications Section, have been made Fellows of the Australian Institute of Agricultural Science.

Mr. W. W. Bryan was the first man in Australia to put hybrid maize seed into commercial production. Hybrid maize has revolutionized maize production both in Australia and overseas.

One of his other achievements has been to provide the basis for highly productive pastures on the coastal lowlands of south-east Queensland, long considered useless.

Dr. T. J. Marshall realized early that soil fertility in Australia was generally lower than in the other great agricultural countries.

His work showed the alarming effect on Australian soils of continuous cereal cropping and has been extensively used to arouse farmers to the dangers of improper management of their soil. The importance of this work has been internationally recognized.

Dr. N. S. Noble spent years studying and developing methods of controlling insect pests through parasitic wasps which attack them. These include pests known to most gardeners such as whiteflies, the green vegetable bug and the fruit-fly.

In 1947 he was appointed to CSIR to help establish a series of national scientific journals which the Council proposed publishing in collaboration with other scientific bodies. Under Dr. Noble's direction the CSIRO journals were developed to their present high standard.

Film Society Wants Members

The 314 Film Society which screens film classics on the third Thursday evening of each month at Head Office has a number of vacancies for new members.

The Society is now in its fifth year and some of the classics shown recently include: "Stagecoach", "Navigator", "Fury", "World of Apu", "Ugetsu", "Citizen Kane", and "Birth of a Nation".

Coming attractions include: "Saturday Night and Sunday Morning", "Mon Oncle", "On the Waterfront", and "Death of a Salesman".

The annual subscriptions are £1.5.0 single and £1.15.0 double.

APPOINTMENTS VACANT

The following vacancies for professional appointments are current:

EXPERIMENTAL OFFICER (E.O. 1/2) — Division of Food Preservation. 300/319 (9/10/64).

EXPERIMENTAL OFFICER (E.O. 1/2) — Division of Organic Chemistry. 606/51 (9/10/64).

EXPERIMENTAL OFFICER (Biochemist) (E.O. 1/2) — Horticultural Research Section. 490/145 (9/10/64).

RESEARCH SCIENTISTS (Chemists/Biochemists) (R.S./S.R.S.) — Division of Protein Chemistry. 464/203 (16/10/64).

RESEARCH SCIENTIST (Physicist or Electronics Engineer) (R.S./S.R.S.) — Division of Protein Chemistry. 462/204 (16/10/64).

RESEARCH SCIENTIST (Organic or Inorganic Chemist) (R.S./S.R.S.) — Division of Organic Chemistry. 606/49 (16/10/64).

607/085-3/rm S(COR)

THE COMPUTER NETWORK

The great value of modern computers lies in their ability to make very complex calculations very quickly. They can handle masses of data accumulated over a long period and can work out relationships which would otherwise be beyond the capacity of man within any reasonable period.

For example a fairly simple experiment in which several species of grasses and legumes are grazed by sheep can produce an enormous amount of data.

Such experiments commonly continue for five to ten years.

Pasture cuts are made at frequent intervals, the sheep are weighed perhaps once a week, their fleece weights are measured and samples of wool taken to determine fineness.

Added to these observations are records of temperature, humidity, and rainfall.

There may also be hay cuts and periods when the sheep are fed back some of the fodder previously conserved.

All these records add up to an immense amount of data which is not only difficult to handle because of its sheer bulk, but also extremely difficult to interpret in terms of the relationship of one factor to another.

This is where the computer comes into its own, quickly and accurately it can provide the research worker with an answer which might otherwise take him months of hard calculation to obtain.

Although the new computers have only been available for a matter of weeks, research workers in CSIRO, universities, and Commonwealth Government Departments have already put them to good use.

The Division of Land Research and Regional Survey has been studying how competition between plants for nutrients affects their growth, while the Division of Fisheries and Oceanography has been analysing the results of scallop and prawn catches in order to forecast potential catches.

The Division of Building Research has studied the transfer of heat in buildings and the Division of Textile Industry the transfer of heat in fabrics.

The Division of Animal Genetics is studying the effects of inbreeding on the development of animals and the Division of Radiophysics is using the computers to calculate the position of radio sources in outer space and to analyze the masses of data coming from the Parkes radiotelescope.

The Division of National Mapping of the Department of National Development is using the computer to convert the angles and distances measured by surveyors in the field into a network of control points, covering the whole of Australia, on which highly accurate mapping can be based.

The Bureau of Meteorology is at present engaged in a pilot study for a computer system to accept telegraphed messages and to analyse and draw weather maps automatically.

Further studies will be aimed at producing a twenty-four hour forecast of the pressure pattern.

The vast store of meteorological data will be treated by automatic methods and some programs have already been produced to assist with flood forecasts.

The Commonwealth Department of Works has used the computers to calculate stresses in reinforced concrete columns of different cross sections so that columns can be designed with the desired strength, while using the least amount of material.

The central unit for the network of computers is the Control Data 3600 in Canberra—the most powerful computer operating in Australia.



The subsidiary computers in Sydney, Melbourne and Adelaide are Control Data 3200's.

The Adelaide machine is already operating, the one for Sydney is now being installed and the 3200 for Melbourne is due by air from Minneapolis this month.

The 3600 in Canberra has a core store or memory of 32,768 words, each containing 48 bits of information.

It has a store access time of 0.7 microseconds. This means additions can be carried out at a rate of nearly 500,000 per second and multiplications at 250,000 per second.

The system has eight magnetic tape units, each capable of transferring up to 120,000 characters per second. Any four of these units can transfer information to or from the computer simultaneously.

Printed results can be recorded at a total rate of 30,000

characters per second and two automatic plotting devices provide graphical results.

A number of visual display units to be installed shortly will provide for a highly flexible mode of input and output which will also allow very high speed photographic recording of output in graphical and textual form.

This will play an important part in research requiring immediate communications between the 3600 and the user.

There is also a high speed card reader, a card punch, two paper tape readers, and two paper tape punches.

The 3600 is capable of considerable expansion. The store can be increased eightfold to 262,144 words and additional central processing units can be added to share the same store.

With equipment of the capability of the 3600, it is important that its operation should not be beyond the scope of the ordinary scientist or research worker.

Control Data has simplified the use of the very high speed 3600 system with a set of utility program which not only control the flow of data but autom-

The console of the Control Data 3600 and the eight magnetic tape units. A Control Data card reader is on the right.

atically convert the program symbols used by the scientist into a form suited to immediate use by the computer.

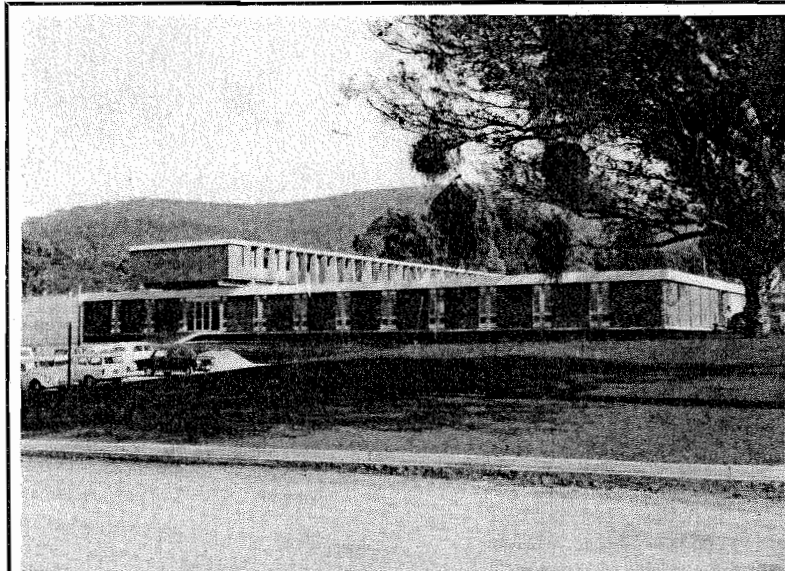
The Control Data 3200 subsidiary computers for Sydney, Melbourne and Adelaide each have a magnetic core store of 16,384 24-bit words.

The 3200 can execute a quarter of a million simple operations in one second.

Each system will have three magnetic tape units, a paper tape reader, a paper tape punch, card reader and punch, two line printers and a graph plotter.

Each system is capable of being expanded at least fivefold.

Canberra staff of the Computing Research Section will include ten research workers, eight numerical analysts and programmers who will act as consultants to those using the computer, eight people responsible for computer operation and data punching, and six others.



The new Computer Laboratory was designed by the Canberra branch of the Commonwealth Department of Works and was built at a cost of £165,000 by Kennedy and Bird Pty. Ltd. The building is broadly cross-shaped in plan. The short section of the cross is of single storey construction and the longer section of two storeys. The building is supported on concrete pier and beam footings.

The structure is of reinforced concrete construction with external finishes of exposed concrete frame and face brick infill panels. The window frames are of aluminium and are double glazed in the computer area.

The Control Data 3600 computer, together with electrical and mechanical plant rooms, administration areas, library and staff amenities, is located on the ground floor. The computer is housed in a special air-conditioned dust-free room. The removable floor, wall partitions, windows, and ceiling of the section in which the computer and its ancillary equipment are installed are based on a common module. This allows flexibility for possible future arrangement and layout.

The first floor houses a series of programming offices and an instruction room. Office windows on the first floor face north east and south west. Sun protection of these offices is provided by a combination of precast concrete blades and horizontal hoods. The site has been landscaped and provision has been made for off-street parking for both visitors and staff.

Electronic Poets

A young man in Florida has just taught a computer to write poetry. He feeds the machine 78 words, including 20 simple phrases, sets it to use noun, adjective, verb in orderly sequence, and the machine grinds out 30 poems a minute.

Here is a sample:

*Darkly the peaceful trees crash
In the serene sun
While the heart heard
The swift moon stopped silently.*

By Russel Baker of the New York Times.

The author of these lines is IBM-709. Capable of only 42,000 mathematical additions per second, it is considered obsolete among modern computers, which may account for the brooding tone of some of its best lines. (For example: "The darkly reality grew harshly"; "Fearfully the silent fields faded"; "The heavy landscape crashed suddenly".)

Nevertheless, obsolete or not, IBM-709 will eventually be able to turn out 500 poems a minute, according to forecasts from Tallahassee.

The pity is that there is no practical use for this talent. Poetry nowadays sells little better than horse collars, and

any poet who cannot fortify his income with a curmudgeon act or lecture-circuit jokes is hard put to pay the milkman.

IBM-709 can expect nothing but contempt from his fellow computers. It is painful to imagine him turning up at class reunions and computer conventions. "That's old 709," the high-speed boys will whisper, "he's down to writing poetry."

At the bar, running tetra-meter through his tubes, he will be hounded with subtle sneering questions. "How many poets have you put out of work this year, 709?"

And, "Why don't you come up to Washington this fall and help us call the election six minutes before the polls close?"

Being a poet has its compensations, however, and in time 709 will discover them. One of these is that most ladies, or at least most ladies whom a computer would want to spend an evening with, would far rather have a poem than a red-hot election statistic.

News In Brief

R.A.C.I. President

Dr. G. M. Badger of the Executive has been elected President of the Royal Australian Chemical Institute.

H. G. Smith Medal

Dr. J. M. Swan of the Division of Organic Chemistry and Dr. D. J. Brown of the John Curtin Medical School have been jointly awarded the 1964 H. G. Smith Memorial Medal of the Royal Australian Chemical Institute.

President

Mr. G. Loftus Hills, Chief of the Division of Dairy Research, has been elected President of the Australian Society of Dairy Technologists.

Doctorate

Dr. J. J. Kowalczewski of the Division of Mechanical Engineering has been awarded a Doctorate of Technical Sciences from the Eidgenössische Technische Hochschule, Zurich.

Honorary Member

Professor Emeritus J. A. Prescott, a former Chief of the Division of Soils and a former Director of the Waite Agricultural Research Institute, has been named an honorary member of the International Society of Soil Science in recognition of his contributions to Soil Science.

Posthumous Award

The late P. G. Schinckel, who was formerly with the Division of Animal Physiology, was posthumously honored last August when the Australian Society of Animal Production at its fifth biennial conference in Sydney made him a Fellow.

Bursaries

Royal Society and Nuffield Foundation Commonwealth Bursaries have been awarded to Dr. Margaret C. Anderson of Cambridge University and Dr. Dr. K. M. King, Assistant Professor in the Soils Department of Ontario Agricultural College, to work with CSIRO for five months.

Dr. Anderson will work with the Agricultural Physics Section of the Division of Plant Industry on light penetration at various levels in pine forests. Dr. King will study micrometeorology and evaporation at the Division of Meteorological Physics.

Soil Science Congress

The General Assembly of the International Society of Soil Science has unanimously accepted the invitation of the Australian Soil Science Society to hold the Ninth Annual Soil Science Congress in Australia in 1968.

Rural Advisers See Plant Industry

Last month a group of thirty-three farm management advisers from Queensland, New South Wales, Victoria, and South Australia spent two days at the Division of Plant Industry learning something of the scope and details of its research programme.

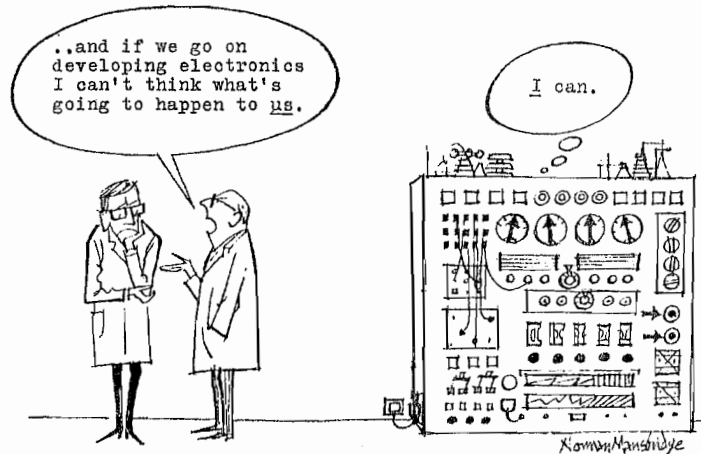
The first day was taken up by discussions and addresses on investigational work and the second day was spent in inspecting the Division's Field Station at Ginnenderra.

The Division hopes to make this an annual event.

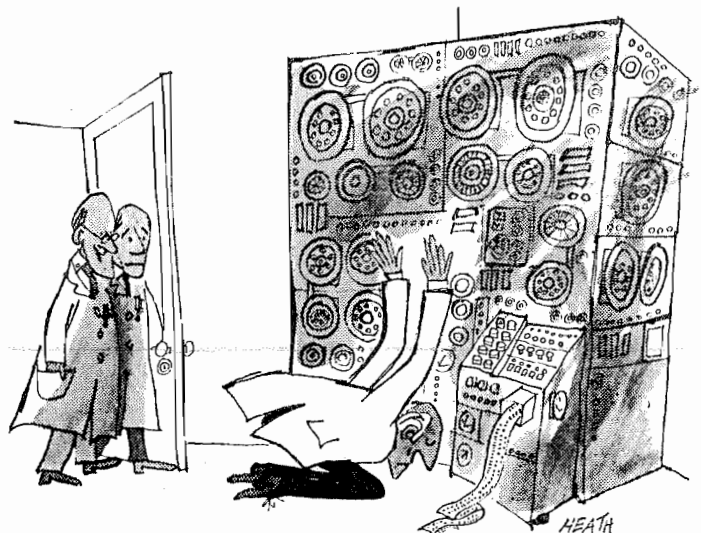
Wool Committee

The Australian Wool Board has recently established a Wool Textile Research Advisory Committee. To avoid confusion with the CSIRO Wool Textile Research Committee which co-ordinates the research activities of the three CSIRO Wool Divisions, the name of the CSIRO Committee has been changed to the Wool Research Laboratories Committee.

The members of the Committee are Dr. F. G. Lennox, Chief of the Division of Protein Chemistry (Chairman); Mr. V. D. Burgmann, Chief of the Division of Textile Physics; Dr. M. Lipson, Chief of the Division of Textile Industry; and Mr. C. Garrow of the Division of Protein Chemistry (Secretary).



WILL IT COME TO THIS?



"I think Smithson's on to something pretty big!"

Copyright London Punch.

OVERSEAS VISITS

Dr. R. Brewer of the Division of Soils left Australia last month to attend the 8th International Soil Science Congress in Bucharest, Rumania, which included a pre-congress tour of the U.S.S.R. Dr. Brewer also attended the 2nd International Working Meeting on Soil Micromorphology at Arnhem, Holland. He will return to Australia via the U.K. and the U.S.A.

Mr. C. A. Gladman of the Division of Applied Physics left last month for Italy to attend the International Institution for Production Engineering Research Conference at Stresa. Mr. Gladman will also visit the U.K. before returning to Australia later this month.

Dr. T. Grace of the Division of Entomology left Australia recently for Europe and the U.K. where he will visit research centres engaged in the study of insect tissue culture. Dr. Grace will also visit the U.S.A. and Japan before returning to Australia.

Mr. D. F. Kelsall of the Division of Chemical Engineering is at present visiting the U.S.A. where he will present a paper to the 7th International Mineral Processing Congress in New York. Mr. Kelsall will visit research centres in the U.K. He will be away for three months.

Mr. V. J. McAllan of the Division of Physics left Australia last month for Canada where he will spend twelve

months with the Division of Applied Physics of the National Research Council, Ottawa, as a visiting scientist.

Dr. M. J. Mulcahy of the Division of Soils left last month for India and the U.S.S.R. en route to the 8th International Soil Science Congress in Bucharest, Rumania. Dr. Mulcahy will visit research centres in the U.K. and Africa before returning to Australia in November.

Dr. G. A. Stewart, Chief of the Division of Land Research and Regional Survey, left Australia last month for Toulouse, France. Dr. Stewart will attend the UNESCO Conference on Principles and Methods of Integrating Aerial Survey Studies of Natural Resources for Potential Development. He will be away from Australia for two weeks.

Dr. J. W. Suiter of the Physical Metallurgy Section left last month for the U.K. where he will attend the International Conference on Field Ionization and Field Emission at Cambridge. Dr. Suiter will also visit research centres in the U.K., including four weeks with the Metallurgy Department at Cambridge University, before returning to Australia later this month.

Dr. D. S. Taylor of the Division of Textile Industry left Australia for Japan and the U.K. where he will visit research centres engaged in projects related to worsted processing. Dr. Taylor will return to Australia via the U.S.A.

Mr. E. G. Thwaite of the Division of Applied Physics left last month to visit research centres in the U.K., Europe and U.S.S.R. Mr. Thwaite will also attend the Annual Meeting of the Optical Society of America in New York, and then return to Europe for further visits before returning to Australia.

Dr. J. R. Vickery, Chief of the Division of Food Preservation, left Australia recently for the U.S.A. where he will attend the International Conference on Radiation Preservation of Food. Dr. Vickery will also visit the U.K. and Europe, where he will attend a meeting of the Executive Committee of the International Congress of Food Science.

Dr. D. J. Walker of the Division of Biochemistry and General Nutrition left Australia in August for the U.S.A. where he will attend a symposium on the Physiology of Digestion in the Ruminant, at Iowa State University. Dr. Walker will also visit the U.K. and Europe before returning to Australia.

Mr. H. K. Welsh of the Division of Applied Physics left recently for Europe where he will attend a Faraday Society General Discussion of Dislocations in Solids at Göttingen, West Germany. Before returning to Australia Mr. Welsh will visit research centres in the U.K., the U.S.A. and Japan.

BIGGER LOANS NOW AVAILABLE

At a special meeting of shareholders of the CSIRO Co-operative Credit Society last month, it was unanimously agreed to raise the loan maximum to £2000.

Loans of this amount may be repaid over 10 years at £11 a fortnight, but can be paid back over a shorter term if preferred.

Interest is still at the rate of 7½ per cent. adjusted quarterly.

The Society will carry the cost of the death indemnity cover as before, but will also carry the cost of the disability cover, which has now been arranged to protect borrowers in the case of forced retirement from active duty due to ill health.

In such an event the loan will automatically be discharged.

Adequate security must be available to support loan applications, such as a lien on payments to the superannuation fund and first and second mortgages on property.

More details of the disability cover will be given in the Annual Report of the Society, which will highlight the activities of the Society.

Membership of the Society is open to all officers and employees of CSIRO, and may be obtained by purchase of five £1 shares in the Society.

Loans amounting to over £250,000 have been made to members of the Society during the last twelve months.

Pioneer

The first woman computer programmer, according to Sir John Cockcroft, was the Hon. Augusta Ada Byron, Countess Lovelace, daughter of Lord Byron.

She endeavoured to use Babbage's "difference engine" to predict the winner of a horse race.

She bet and lost, and had to pawn her jewellery.

SAFETY EXPERT

At the request of the Executive, Dr. D. O. Shiels has agreed to continue in a specialist advisory capacity so that use can be made of his extensive knowledge and experience in medicine and industrial hygiene.

If his services are required he may be contacted through the Head Office Safety Officer.

New Appointees

Dr. C. Abraham has been appointed to the Computing Research Section. Dr. Abraham graduated B.Sc. from the Hebrew University of Jerusalem in 1959 and M.Sc. in the same year from the Weizmann Institute.



Dr. C. ABRAHAM

stitute of Science in Israel. He has been working at the Weizmann Institute in the Department of Electronics, where he recently completed his Ph.D. thesis on the theory of micro-magnetics.

Mr. A. W. S. Johnson has been appointed to the Division of Chemical Physics where he will work with the electronic diffraction group. Mr. Johnson graduated B.Sc. (Hons.) in 1958 and M.Sc. in 1960 from the University of Western Australia. Since then he has been working for his Ph.D. at the same University.



Mr. J. S. ARMSTRONG

Mr. J. S. Armstrong has been appointed to the Computing Research Section as Education Officer.

cer. Mr. Armstrong is a Science graduate of the University of Manchester, and has been working as lecturer in Electrical Engineering at the Heriot-Watt College in Edinburgh.

Dr. P. J. Fullager has been appointed to the Division of Wildlife Research, where he will undertake studies of the ecology of rabbits and the effects of different strains of myxomatosis on rabbit populations. Dr. Fullager, who graduated B.Sc. from the University of London in 1960, recently completed his Ph.D. at the Royal Veterinary College, London.

Dr. R. K. Scopes has been appointed to a post-doctoral fellowship in muscle biochemistry in the Division of Food Preservation where he will undertake research on the physical and chemical changes which take place in muscles after death. After graduating B.A. from Cambridge University in 1961 he worked at



Dr. R. K. SCOPES

the Low Temperature Research Station of the Agricultural Research Council at Cambridge. Dr. Scopes obtained his Ph.D. recently for his thesis on the denaturation of muscle protein in post-mortem conditions.

Mr. J. A. B. Palmer has been appointed to the Computing Research Section, where he will assist with numerical analysis problems. Mr. Palmer, who graduated B.Sc. in 1959 from the University of St. Andrews, has worked with Leo Computers Ltd. as a senior programmer and with the Central Electricity Generating Board as mathematical statistician.

KATHY TROUTT IN RECORD DIVE

Seventeen-year-old Katherine Troutt of the Division of Fisheries and Oceanography recently set the Australian record for women skindivers by descending 302 ft.

Katherine, who took up skindiving only eight months ago, said afterwards: "It's easier than surfing and less dangerous."

"But," she admitted, "it's a bit scary down there."

"I was so nervous I didn't notice much of anything. A school of sharks could have been watching me."

Katherine was accompanied by the southern hemisphere men's depth champion (Mr. Wally Reynolds) on the nine-minute dive.

Both wore lead belts and were tied together.

Mr. Reynolds said afterwards he had to tap Katherine on the shoulder to make her drop a second lead belt she was carrying to keep her from sinking too deep.

Katherine said she remembered reaching the 300-foot mark, but could not remember dropping the second belt.

Mr. Reynolds said that 300 ft. is considered the absolute limit for safety.

Commented Katherine: "I don't see the danger in it."

She and Mr. Reynolds made the dive from a specially equipped launch five miles off Sydney Heads.

Katherine became interested in skin-diving only last January.

She learned the sport at a skin-diving school organized by Mr. Reynolds.

He said the instructors were agreed she was about the best pupil they had coached.

"She's a natural in the water," said Mr. Reynolds.

Before yesterday Katherine had only made three dives deeper than 75 ft.

When she dived to 200 ft., without any ill-effects on Saturday she decided to go for the record next day.

The previous record was 242 ft.

The record dive was measured



ured by an echo-sounder as well as a measured rope called a shot-rope, which the divers held during the dive.

Katherine said she would not be trying for Mr. Reynolds' record of 327 ft. "Well, not for a while, anyway."

New Books On Pastures

The Division of Tropical Pastures and the Division of Plant Industry have been responsible for two recently published books on pastures.

"Some Concepts and Methods in Sub-tropical Pasture Research" has been published by the Commonwealth Agricultural Bureaux as Bulletin 47 of the Commonwealth Bureau of Pastures and Field Crops.

This book was written by officers of the Cunningham Laboratory in Brisbane and was edited by a five man committee under the joint chairmanship of Mr. W. W. Bryan and Mr. J. E. Coaldrake.

It is written primarily for the person with a basic training in science and the agricultural scientist who is new to pasture research, rather than for the experienced research worker.

At present extensive areas of undeveloped land in the sub-tropics and tropics offer great scope for increased production of meat, milk and animal fibres, especially through the use of ruminants on pastures and forage crops adapted to difficult climates and soils.

However, much of the knowledge of pasture development in cool-temperate and "Mediterranean" regions is not directly applicable in sub-tropical and tropical regions; techniques for research on tropical pastures are still in a state of flux, and the relevant literature is sparse.

The bulletin attempts to remedy the situation by setting out the ideas and methods developed by members of the staff of the Cunningham Laboratory during some twenty years of experience in the lower latitudes of Australia.

It deals with the many problems of synthesizing entirely new pasture communities derived from legumes and grasses introduced from different parts of the world, and of gaining high animal production from infertile soils.

The discussion covers all stages of pasture development from the ecological assessment of new regions, through the selection or breeding of new plants (especially legumes), the correction of nutrient and rhizobial deficiencies, chemical analysis of plants and soils, to the evaluation of animal production on statistically designed grazing experiments.

The other book, "Grasses and Grasslands" has been prepared by officers of the Division of Plant Industry and edited by Dr. C. Barnard. It is published by Macmillan and Company.

It aims at bringing together under one cover some of the knowledge and experiences of grasses and grasslands which has been accumulated by officers of the Division.

While the Australian scene has been used freely in illustration, the book presents an up-to-date world-wide view of the biology of grasses.

The first chapter presents a picture of the historic development of grasses and grasslands in relation to the animals, including man, which feed upon them.

The next nine chapters deal with different phases of the biology of grasses including botanical classification and relationships, distribution, morphology and anatomy, germination, quantitative analysis of growth, relationships between growth and environment, reproductive mechanisms, cytogenetics, and selection methods for species improvement.

The last four chapters deal with the plant communities of grasses or grasslands, their evolution and distribution, nutrition, and utilisation in grazing and soil conservation.

Printed by CSIRO, Melbourne

SMALL BORE RIFLE TEAM



The Division of Food Preservation now has a small bore rifle range beneath its Food Science Building. The range was built by enthusiastic members of staff who constitute the CSIRO Small Bore Rifle Club. The club has thirty-five members, including several women, and membership is open to the staff of the Division of Food Preservation and other CSIRO Divisions at North Ryde.

Shooting takes place at lunch time and after work. In a recent competition within the Division of Food Preservation, the Canning Section team won the J. R. Vickery shield, which is named after the Chief of the Division, with an aggregate score of 274.5 out of a possible 303. The highest individual score (98.3 out of 101) was obtained by Mr. G. Ziemelis. Club members have obtained creditable scores in N.S.W. State Championships, and some of them have entered for forthcoming competitions.

Our picture shows Mr. P. Rutledge, Mr. G. Ziemelis and Mr. P. Board of the Canning Section rifle team, with Dr. J. R. Vickery, who is holding the shield named after him.

CORESEARCH

FOR CIRCULATION AMONG MEMBERS OF CSIRO STAFF — NUMBER 68, MELBOURNE, NOVEMBER 1964

Mr. WHITLAM SPEAKS ON CSIRO

There was an almost total lack of strategy or policy for science in Australia, the Deputy Leader of the Opposition, Mr. G. Whitlam, told the House of Representatives last September.

Mr. Whitlam was the only Member of the House to speak at any length on CSIRO during the debate on the estimates of CSIRO and the Department of National Development.

He said that Australia spent less than £50 million annually on scientific research and of this only about £8 million was spent by industry.

"By any international comparison, our expenditure on scientific research is pitifully inadequate," he said. "I shall give four yardsticks."

"First, in the United States, expenditure on scientific research amounts to 3 per cent of the gross national product, in the United Kingdom 2.5 per cent, in Canada 1 per cent and in Australia .7 of 1 per cent.

"Secondly, scientists and engineers represent 7 persons per 1,000 of the population of the Soviet Union, 4.5 persons in the United States, 2.6 persons in Britain and 2.7 in Australia.

"Thirdly, the chemical industry in Switzerland spends on research more than is spent by the whole of Australia.

"Lastly, each of the Bell Telephone, du Pont and General Electric companies in the United States employs more scientists than are employed in the whole of Australia.

"This year there will be an increase of £3.3 million available to CSIRO compared with the amount expended last year, but despite this, there is insufficient provision in the estimates for the growth of scientific staff.

"Last year CSIRO had 1,678 personnel, classified as research officers, experimental officers, scientific services officers and draftsmen.

"This year the number will be increased by only 34, an increase of 2 per cent. The annual increase should be at least 5 per cent, and preferably 7 per cent, if the CSIRO is to carry out its existing activities properly and embark on new projects.

"Another feature of these estimates is the tendency of CSIRO to rely on outside grants to bridge the gap in its finance.

"Most of these outside funds are received from the Wool Research Trust Fund and various other funds connected with primary industry.

"These outside funds are very welcome and CSIRO returns very good value for the money spent from these funds.

"However, the tendency to rely on outside funds is not desirable if it leads to undue emphasis on applied research in new projects.

"To be fruitful, pure and applied science must proceed hand in hand.

"The CSIRO should have sufficient finance to undertake more industrial research. But



Mr. E. G. WHITLAM

just as important, manufacturing industries should themselves be undertaking more research.

"One factor limiting what they do in this field is the number of them that are controlled from overseas. The Government should give tax concessions to encourage industry to conduct more research.

"The Government should also examine the possibility of abolishing payroll tax on research staff.

"It should also consider the high duties on imported scientific equipment which we do not make ourselves.

"It is clear from these estimates that the Government has little intention of increasing substantially the amount spent by CSIRO on research.

"Perhaps the Government has in mind spending more on the universities when the committee brings down its report on tertiary education.

"They certainly need more money for research, but where will the Ph.D. graduates resulting from the expenditure get jobs if the CSIRO does not expand?

"Expenditure on research needs to be greatly increased right throughout the whole field of scientific activity—government, universities and industry.

"At present CSIRO is very restricted. Any organization like this should have a special fund for the Executive to deploy at its discretion to start off research into new fields likely to be significant to the nation.

"Since this would be an initiating fund it need not be very large, but it could speed up the process of getting new developments off the ground.

"There is also a clear need for CSIRO expenditure to be planned over a greater period.

"It is five years since the computer laboratory was mooted within CSIRO. Such a time lag should be cut down.

"In the light of the present critical position of science in Australia, these estimates give no grounds for encouragement.

"The Government is adopting a quite short sighted approach to expenditure on scientific research.

"The Australian people are justifiably proud of the work of the CSIRO. The organization should, however, be more forthright in its annual reports in putting its point of view and pointing out to the Parliament the critical state of scientific research in Australia, not only in its own institution but throughout the community.

"At present Australia is seriously lagging in scientific research. We are too dependent on other countries.

"In these estimates the Government shows how little it appreciates the need for that science strategy for which the Chairman of the CSIRO called last January in his Presidential Address to ANZAAS."

Holiday Flats

Members of CSIRO in Melbourne or Geelong may be interested in the shares which the Angelsea Holiday Club has for sale.

The shares, which cost £100 each, entitle their owners to rent a holiday flat at Angelsea for £2 a week.

Further details can be obtained from the Club Secretary, Mr. J. Lavery, at Head Office.

New Arrangements For Head Office

As from last month Head Office has been reorganized into three groups—the Secretariat Branch, the Agricultural and Biological Sciences Branch, and the Industrial and Physical Sciences Branch.

The need for this has arisen from the growing size and complexity of CSIRO, the need for closer contact between the Executive and the Divisions and Sections, and the increasing business to be done with Government departments, industry committees and associations, and industrial firms. There are also inevitable difficulties to be coped with in the period during which the Executive in Canberra is separated from the Head Office in Melbourne.

While the Executive is responsible for the overall scientific policy and management of CSIRO, it is the function of Head Office to assist in the development, elucidation and implementation of this policy.

The Secretariat Branch will be responsible for the co-ordination of scientific policy and administration; for all general administrative matters and the provision of services related to finance, personnel, works and buildings, publicity, international affairs, and special projects and services; for the administration and co-ordination of the Regional Administrative Offices and for the services in the Executive's Office in Canberra.

The Agricultural and Biological Sciences Branch will be responsible, in association with the Executive, for matters affecting the agricultural and biological Divisions; for the provision of advice to the Executive and the Secretary in this field and the interpretation of Executive policy to the relevant Divisions; for advice and assistance to the Executive in the review and assessment of new and existing research programmes; for keeping in close touch with agricultural

industry and with agricultural bodies and committees; and for the provision of an agricultural liaison service.

The Industrial and Physical Sciences Branch will be responsible, in association with the Executive, for matters affecting the industrial and physical sciences Divisions; for the provision of advice to the Executive and Secretary in this field and the interpretation of Executive policy to the relevant Divisions; for advice and assistance to the Executive in the assessment of new and existing research programmes; for keeping in touch with industry generally and with industry bodies and committees; and for the provision of an industrial liaison service.

The Industrial and Physical Sciences Branch will continue to be responsible for handling negotiations with industry for contract-sponsored or other forms of co-operative research, and for all CSIRO patent activities.

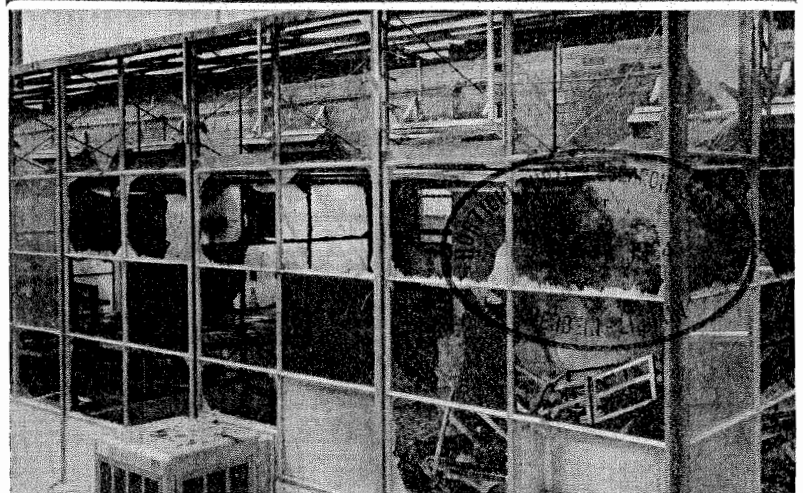
The Secretary, Mr. G. B. Gresford, who will be in charge of the Secretariat Branch, will also be responsible for the overall co-ordination of the three branches.

While retaining his present responsibility for certain Divisions and Sections, Mr. Ives will be in charge of the Agricultural and Biological Sciences Branch.

Mr. Lewis, who will have the title of Executive Officer, will be in charge of the Industrial and Physical Sciences Branch.

The Industrial Research Liaison Section will cease to exist as a separate section and its activities will be incorporated in the Industrial and Physical Sciences Branch of Head Office.

FIRE GUTS CANBERRA GLASSHOUSE



Important insect-control investigations received a severe set-back last month and damage valued at more than £8,000 was caused when a fire swept through a specially-equipped insect house of the Division of Entomology in Canberra. Five rooms of the glasshouse section were destroyed and the roof of the building damaged. The main experiments affected were concerned with the plague-loest, the light brown apple moth, and a parasite of the weed, St. John's wort. Fortunately some field studies can be used to help reconstruct the experiments. The cause of the fire is not known but there are no suspicious circumstances.

APPOINTMENTS VACANT

The following vacancies for professional appointments are current:

- RESEARCH SCIENTIST (RS/SRS)—Division of Animal Health. 202/230. (27/11/64.)
- RESEARCH SCIENTIST (RS/SRS)—Division of Forest Products. 290/708. (27/11/64.)
- RESEARCH SCIENTIST (RS/SRS)—Division of Building Research. 390/326. (13/11/64.)
- RESEARCH SCIENTIST (RS/SRS)—Division of Land Research and Regional Survey. 618/158. (27/11/64.)

2 607/085/3/CO S(COR)

SENATE DEBATES CSIRO ESTIMATES FOR 1964-65

The 1964-65 Estimates for CSIRO were debated in the Senate on the 1st and 13th of October. A number of Senators rose to speak on the Estimates, and various questions arising from the debate were answered by Senator Gorton.

Senator Murphy (New South Wales) said that Australia was proud of CSIRO, and the international reputation of its work.

He said, "There is no doubt that the Executive and the officers of the Organization constitute a band of brilliant and dedicated men devoted to the pursuit of knowledge and the enlightenment of mankind, especially in relation to primary and secondary industries in Australia."

After discussing various aspects of the Organization's activities he continued, "Scientific work in a community such as ours should be planned on a long term basis."

"Science cannot be dealt with on the basis of year to year planning. There ought to be some indication in these estimates that the Organization is being dealt with on a long term basis so that it can make the plans it would desire to make for future years."

Senator Murphy also criticized secondary private industry for failing to exert pressure on the Government for more research into secondary industry.

He said that some of the failure on the part of secondary industry was due to the fact that most secondary industry was owned by overseas firms uninterested in promoting research in Australia.



Senator L. K. MURPHY

However, there were very many small firms with a tremendous stake in the development of our industry whose future depended on increasing research into secondary industry.

He continued, "The provision which has been made for such research is completely inadequate when one considers the importance of secondary industry in the community, the numbers dependent upon it for their employment, and the part it has to play in the future of Australia."

In reply to Senator Murphy, the Minister-in-Charge of CSIRO, Senator Gorton, said, "It would be quite possible to make a case for the whole of the Federal Budget to be spent in various fields of scientific research, just as it would be possible to make a case for it to be spent on education or on defence."

"Research in CSIRO is only a part of the scientific research that is being carried out at the present time. We must not forget the research done by the universities, by the Australian Atomic Energy Commission and by the State Departments of Agriculture in various fields."

"But the Government, having made funds available to CSIRO, it is then the Executive's responsibility—and it is one in which, except in exceptional

cases, the Minister would be reluctant to interfere—to decide the fields in which the money that has been allocated should be spent."

Senator Kennelly (Victoria) said that CSIRO was one of the most important instrumentalities affecting the welfare of Australia.

"I have tremendous admiration for the work that is done by CSIRO," he said, "But the thing that amazes me is the small amount of money that is made available to an organization whose research and discoveries help so many people."

"It is extremely small when compared with the amount of money that is made available to similar organizations in other countries."

Senator Murphy said that there was a great deal of dissatisfaction in the community because there had been no real increase in the work carried out by CSIRO.



Senator P. J. KENNELLY

"There is some increase in the overall provision for the Organization but when one looks at the increases due to awards of the Conciliation and Arbitration Commission, one finds that most of the additional vote will be taken up by such increases and also by large amounts such as the increased vote for scientific computing equipment."

"The feeling of a great number of persons who are knowledgeable in this field is that the Organization is at a standstill and that the Government is not very sympathetic to it."

"This is a very bad atmosphere for such a great organization."

"Will the Minister explain why such a poor provision is being made for the CSIRO in view of the great national demands for scientific research which are not being fulfilled by other organizations such as universities and private companies?"

In reply Senator Gorton said, "The question has been raised whether the Government should have made more money available to the CSIRO. I can only say that I believe the Government is making sufficient money available to CSIRO to allow it to grow."

"The extent of the growth which should be allowed this or any other Government instrumentality obviously always will be a matter of debate."

Senator Scott (Western Australia) said that although this year's appropriation had been increased by about 25 per cent, he felt that a lot more could be spent on CSIRO.

He said that some people within the Organization, anxious to gain further knowledge in the field of agriculture,

received no financial assistance from the Government to enable them to gain that knowledge overseas.

"Some of them have had to rely on overseas companies, organizations or individuals to provide the necessary funds."

"I know that unlimited sums of money cannot be granted—but this great Organization is of the utmost importance to Australia, particularly when we consider the great increase in the revenue earned by our agricultural producers as a result of the application of the results of the Organization's scientific studies."

Senator Murphy said that one of the most serious problems facing the Executive was the urgent need to accelerate the building programme so as to provide adequate accommodation for scientists throughout the Organization.

"Whether we look at the estimates for the Department of Works or at those for the Department of the Interior to find a solution to this urgent problem that is facing CSIRO, we do not find a solution in any appropriation for this year."

"More than £1½ million of the total increase in the estimates for the Organization is attributable to the establishment of a computing laboratory and computing facilities."

"They are important, but when one subtracts that amount and considers the increase in the structure, it is apparent that this Organization is at a standstill."

"I am speaking of it organizationally, of its scope and of the number of persons engaged in its work."

"I am not saying that the work which has been done within the scope permitted of it has not been done well. I think we all realise that it has been. We are extremely proud of it, but it is being cramped."

In reply Senator Gorton said, "The total sum of money available for equipment and new capital works of all kinds had been increasing steadily."

"In 1962-63 the sum available was approximately \$960,000, in 1963-64 approximately £1,787,000; and in 1964-65 it will be approximately £3,108,000."



Senator J. G. GORTON

"Of the proposed appropriation for 1964-65 a sum of approximately £1.5 million will be used for the purchase of a computer."

"That indicates that the CSIRO, when making up its own mind about how it wished to spend the money that would be available to it, decided that a computer would be of the highest value, just as previously it decided that a phyto-tron would be of the highest value."

"I do not think there will be a rapid catching up of the laboratory requirements of the Organization."

"The Organization is not at a standstill, nor is the size of its scientific staff or research staff dropping."

"The total increase in the number of people working as scientists and research staff for the CSIRO this year will be 132 or perhaps more."

Senator Cormack (Victoria) said that the Government, the Parliament and the public generally tended to be bluffed by the CSIRO, which was beginning to exist as an organization for its own sake rather than for the purpose of producing what the Parliament might reasonably expect it to produce.

"I find myself wondering whether the Organization should not confine itself to applied scientific research and whether it should not pass back original scientific research to the Australian universities," he said.

"Original research should never have been removed from the universities."

Senator O'Byrne (Tasmania) said he was quite certain that CSIRO had over the years made a tremendous contribution to the advancement of nearly every section of primary and secondary industry in Australia.

"However, in my view," he said, "it has been purposely restrained and restricted because of Government policy over the past 15 years or so."

"The items that we have under discussion now involve a total expenditure of £14,135,000."

"In a total Budget of £1,094 million this is the amount which is devoted to scientific and industrial research."



Senator J. O'BRYNE

"A country which is directing so small a proportion of its revenue to matters of such tremendous importance is missing a great opportunity in this day and age not only to maintain the status quo but also to expand as nearly every country with a vision of the future is doing."

In reply Senator Gorton said that, while it appeared that the Government was voting only £14 million for expenditure by CSIRO, this was not so.

"Quite a large sum for the CSIRO comes from other organizations, but those organizations get at least 50 per cent, and in some cases considerably more, back from the Commonwealth Government in the form of matching funds."

"What is relevant is the total amount available to the CSIRO to spend, and as a matter of fact it is about £19½ million when the works vote of £1.73 million is taken into account."

After this, the Senate adjourned and the Estimates debate was not resumed until 13th October.

Senator Dittmer (Queensland) said that CSIRO had been fortunate to have been under the people who had directed it from time to time. Each had been brilliant and had made a real contribution to the Organization.

"However," he went on, "There should be a more co-ordinated approach to scientific research; the contribution that this country makes to it is paltry."



Senator F. DITTMER

"I cannot congratulate the Government on its parsimonious approach."

"The shortage of money for buildings has been a continual cry of the CSIRO."

Senator Gorton replied that the need for co-ordinated research was not directly related to the estimates and was obviously a matter of opinion.

"For myself," he said, "I do not believe that if the concept is that all scientific research throughout Australia should be co-ordinated by some central body, this would be a good thing either for science or for Australia."

"I believe that by the richness that can come from a number of people working in different fields, without one central directive organization, we are likely to get in the ultimate a better scientific result."

Senator Morris (Queensland) praised the work of the Division of Tropical Pastures which he considered had contributed more to the economy and the prosperity of Australia than almost any other undertaking that he could think of.

Senator Cavanagh (South Australia) said that possibly no other institution had made a greater contribution to the development of Australia in post-war years than had the CSIRO.

He felt that there was still a lot to be done and that the Organization could well be expanded.

Senator Murphy asked Senator Gorton whether steps had been taken to revise the superannuation scheme to allow free interchange between the universities and CSIRO.

He also asked whether consideration could be given to a system of post doctoral fellowships to bring talented young scientists to Australia, regular sabbatical leave for research officers, and provision for visits each year by eminent scientists from overseas?

In reply, Senator Gorton said, "The superannuation question, which is an important one, is under review. Nothing has been done about it yet."

"The question regarding possible post doctorate courses in one that I shall discuss with the Chairman of CSIRO."

News In Brief

Professor Emeritus

The Council of the University of Adelaide has conferred the title of Professor Emeritus on Dr. G. M. Badger, in recognition of his distinguished service both to science and to the University.

Doctorate

Mr. A. B. Beck of the Division of Plant Industry has been awarded the degree of Doctor of Science by the University of Adelaide.

H.O. Transfer

Cabinet agreed last September to a recommendation that Head Office be transferred from Melbourne to Canberra in the financial year 1968/69. A special committee has been established to advise the Executive on the various steps associated with the transfer. The members of the committee are Mr. G. B. Grosford (Chairman), Mr. D. T. Gillespie, Mr. R. W. Viney, Mr. B. Beresford-Smith, and Mr. A. F. Gurnett-Smith (Secretary).

Visitors To Forest Products

Following the Seventh Session of the F.A.O./Asia-Pacific Forestry Commission in New Zealand last month, a number of Asian visitors took the opportunity of seeing at first hand something of the work of the Division of Forest Products. Visitors to the Division included Mr. Chogo Tanaka, Director General of the Japanese Forestry Agency; Professor Sadao Ogiwara of the Forestry Department, University of Tokyo; Dr. M. Monsalud, Director of the Philippines Forest Products Research Institute; Professor Domingo Lantican of the College of Forestry, University of the Philippines; and Mr. Krit Samapudhi, Forest Products Expert of the Thailand Royal Forest Department.

Kangaroo Enthusiast Returns

Miss P. J. Berger of the United States who recently worked for

the Division of Wildlife Research during her university vacation because of her interest in kangaroos has now returned to the Division as a Fulbright student.

Miss Berger graduated B.A. with Honours in Zoology and Chemistry from the Wellesley College, Massachusetts, last June.

Her project will embrace a study of the breeding of the tamar wallaby (*Protemnodon eugenii*) both in the wild and in captivity, a study of the suckling stimulus on embryonic development of this species, and studies of the respiration of newborn and pouch young of *Protemnodon eugenii* and other marsupials.

Sheepskin Rugs

Senator Edward Kennedy, who recently broke his back in an air crash in the United States, is recovering on medical sheepskins of the type developed by the Division of Protein Chemistry.

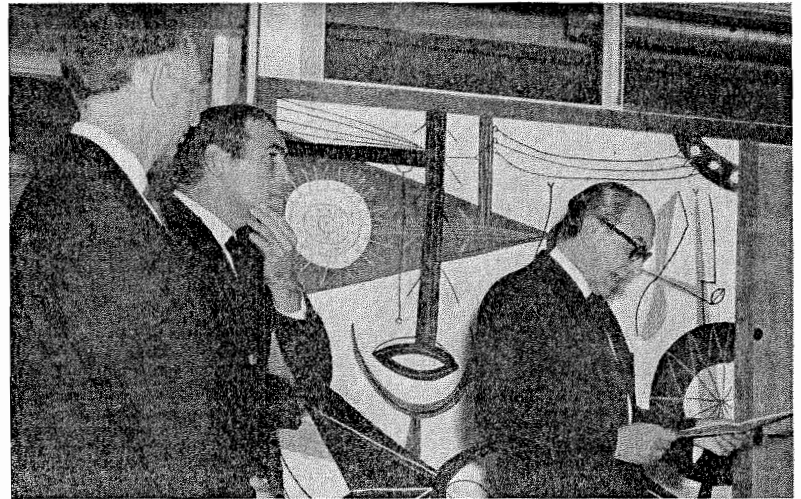
Senator Kennedy, a brother of the late President Kennedy, was given the sheepskins by Dr. Martin Lydon, who is President of the Lowell Institute of Technology in Massachusetts and was a classmate of President Kennedy at Harvard University.

During a visit to New Zealand earlier this year, Dr. Lydon became ill and spent some time in bed on a medical sheepskin rug provided by the New Zealand Wool Board. Following his illness he asked the Board to send two rugs to Senator Kennedy.

Year Of The Angry Rabbit

Australian author Russel Bradon's latest book, "The Year of the Angry Rabbit", describes how CSIRO scientists, experimenting on how to wipe out rabbits, accidentally develop a bacteria capable of wiping out the human race.

The U.S. and the Soviet Union surrender their nuclear weapons to Australia, which gains world domination in politics as well as tennis.



ANOTHER MURAL FOR CANBERRA

"When I feel like painting, I paint," said world famous Uruguayan artist, Carlos Paez Vilaro, during a recent four-day visit to Canberra in which he painted one mural, seven pictures and three six-foot panels, as well as making innumerable drawings.

The mural — two panels of wall on either side of the conference room door of the building shared by the Divisions of Entomology and Plant Industry — was completed in four hours.

The right panel, in black, terra cotta and yellow symbolises the Division of Entomology and the left hand panel in green, black and yellow the Division of Plant Industry.

The Uruguayan Charge d'Affaires, Dr. Carlos Perez del Castillo, presented the mural to CSIRO at a ceremony attended by people from CSIRO and diplomatic representatives.

Dr. Castillo said that his country was very grateful for the tremendous assistance given to its rural industries by CSIRO and Australian universities, and it was as a token of thanks that Uruguay had sent one of its greatest artists to leave a tangible expression of the bonds which had grown between the two nations.

He said that Vilaro was not only a very good painter, he was also a man who felt deeply all the joys and hardships of humanity.

Vilaro is a self-made artist. He began painting with the inspiration derived from a small group of negroes, the last descendants of the slaves of the colonial period, who live in a small neighbourhood of Montevideo.

He has been interested not only in painting them but has also worked to improve their social and cultural level, helping them to maintain and improve the African folklore which they have kept, almost religiously.

He has started schools of apprenticeship where he teaches them ceramics and offers them a reason for their lives.

A friend of Picasso and a professed enemy of blank walls, Vilaro once painted a 164 ft. by 26 ft. Montevideo wall which he knew was going to be demolished a few weeks later.

His most famous work, however, is the world's largest mural on the walls of the 170 yard tunnel between the Pan American Union Buildings in Washington. More than 700 pounds of paint were used on the mural.

Some of his other works are a huge mural at the new Tahiti International airport ex-

pressing speed of movement, a mural in a gaol in Uruguay in which he was assisted by some of the convicts, and a mural expressing hope in the world famous lazaretto of Dr. Albert Schweitzer in the jungles of Gabon.

Smoking a pipe continuously and talking in rapid Spanish, Vilaro explained the Canberra mural as he painted.

He said his insects and plants were purely symbolic—the way he felt about them. Any scientists who discovered one of his insects or plants in nature would have made a discovery indeed.

The plants had bright clear colours ("You can see chlorophyll and energy") and grew at all angles to maintain a balanced abstraction.

Vilaro, who works without any preliminary lines, continued "When I started painting I used to draw a sketch but then I realised that the best part of the work is when you have begun. Now I am just like this plant. Just as the plant grows my work grows."

He said with a smile that he took the risk of using a pre-

dominance of black lines "because I love black. Possibly it is reflection of my character."

Vilaro, who is a firm believer in integrating art into everyday life, would like to see Sydney painted red, Melbourne green, and Canberra deep chocolate.

He would like buses to be painted to fit in with the local colour scheme, and each city identified by its colour.

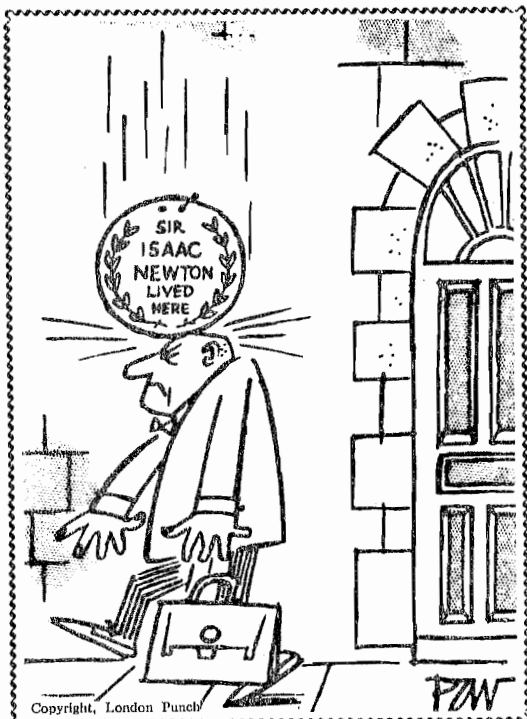
He would also like all lifts to be made of crystal and the lift wells painted in a continuous mural.

Before coming to Australia, Vilaro spent four months in Tahiti painting a mural for Marlon Brando and tattooing.

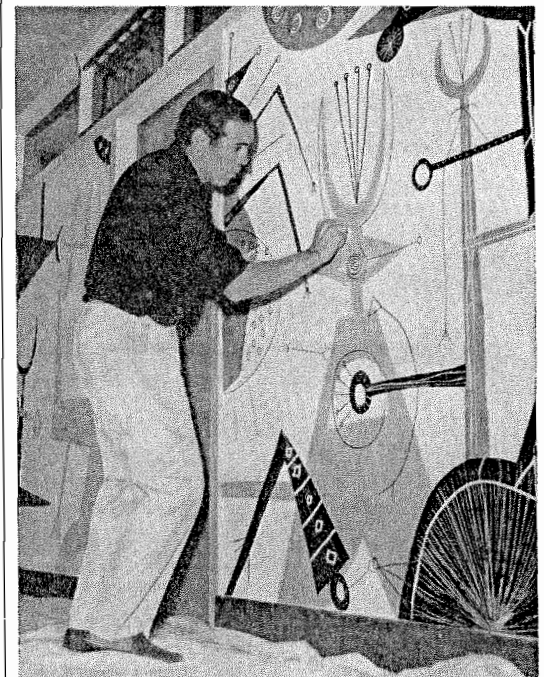
At the end of his stay in Canberra, Vilaro flew on to Cairo to do a mural for President Nasser.

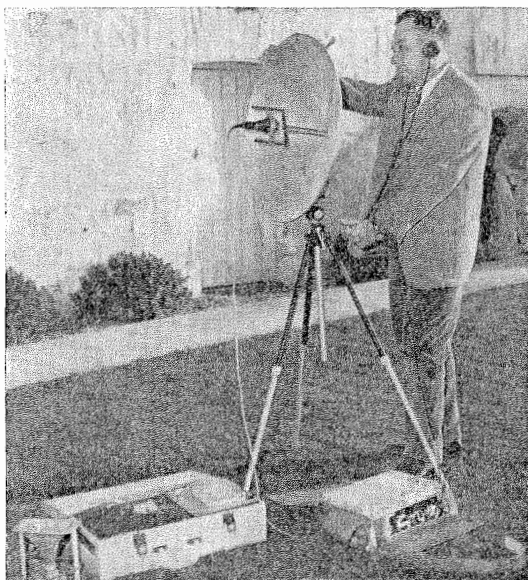
Above. Watched by the artist and the Chief of the Division of Entomology, Dr. D. F. Waterhouse, Dr. Castillo officially presents the mural to CSIRO on behalf of the people of Uruguay.

Below. The artist at work.



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Courtesy "The Canberra Times"

Magpie Backchat

Dr. B. Falls, Associate Professor of Zoology at the University of Toronto, will return to Canada in December after spending six months working with the Division of Wildlife Research on communication in the black backed magpie.

Dr. Falls, who is visiting Australia under a Royal Society and Nuffield Foundation Commonwealth Bursary, is mainly interested in studying the principles underlying particular problems in the behaviour and ecology of small mammals and birds.

In recent years his programme has extended to the significance of bird calls and he has studied the effects of song on birds by recording their calls and playing them back in a different area.

He has used this play back technique to study the significance of bird vocalisation in the defence of territory, the definition of territorial boundaries of individual birds, the extent to which birds can recognize other individuals by voice, and the characteristics of the calls of particular species.

His work at Canberra has been concerned largely with communication in relation to the territorial behaviour of the black-backed magpie (*Gymnorhina tibicen*).

Dr. Falls found the extension of his work on bird calls to the magpie of special interest, since, in contrast with other birds he has studied, magpies defend their territories in groups which are made up of more than one pair.

Further, studies of the magpie by Dr. R. Carrick of the Division of Wildlife Research have provided a marked population

of a large number of birds with extensive data available on individuals and their territories.

Often when Dr. Falls has recorded a magpie's song and played it back elsewhere, magpies, hearing the sound, have attacked the apparatus to drive away the foreigner.

Dr. Falls said the song of one particular species held no attraction for birds of other species.

"I believe that this acts as a deterrent to interbreeding among species, even those which closely resemble each other," he said.

"On the other hand, it seems that certain calls, such as warnings of predators, are shared by different species."

Dr. Falls said the significance of studying in this field was that a knowledge of different animal sounds could be used as a means of influencing animals.

"Some work has been done in the field of pest control by using the recorded distress signals of birds to frighten them away from crops and airports," he said.

"I am more interested in the fact that we can learn more about the basic biology of birds through their language."

Our picture shows Dr. B. Falls with the apparatus which he uses to record bird calls. The parabolic reflector has a microphone mounted in it connected to a tape recorder.

VISITORS FROM OVERSEAS

Dr. R. A. Friedel, Project Coordinator of Spectrometry at the Pittsburgh Coal Research Center of the U.S. Bureau of Mines has been seconded to the Division of Coal Research for twelve months. Dr. Friedel is mainly concerned with infrared, nuclear magnetic resonance, and mass spectrometry work.



Dr. R. A. FRIEDEL

Professor C. A. Swenson of the Physics Department, Iowa State University is spending a year with the Division of Physics during the tenure of a National Science Foundation Senior Post-Doctoral Fellowship. He is setting up apparatus



Professor C. A. SWENSON

for the measurement of thermal expansion of solidified inert gases and alkali metals at temperatures down to 1.5 degrees Absolute.

Mr. Nelson S. Perkins of the U.S. Department of Commerce, who retired recently as Technical Director of the Douglas Fir Plywood Association, is at present on a five week visit to Australia. An expert on plywood and timber, Mr. Perkins will have discussions with officers of the Division of

Forest Products and will lecture to members of the timber and plywood trade throughout Australia. He will also visit New Zealand and the Philippines before returning to the U.S.

Below: Mr. Perkins (left) and Mr. J. W. Gottstein, Officer-in-Charge of the Plywood and Gluing Section of the Division of Forest Products, examine a radiata pine veneer.



New Appointees

Mr. G. M. O'Donovan has joined the Division of Organic Chemistry where he will assist in chemical studies of plants toxic to livestock. Mr. O'Donovan graduated B.Sc. in 1962 and M.Sc. in 1963 from the University of Auckland.

Dr. J. E. Vercoe has joined the Division of Animal Genetics and will be stationed at the Cattle Research Laboratory, Rockhampton, where he will undertake research on the efficiency of feed utilization. Dr. Vercoe, who graduated B.Agr. Sc. in 1957 and M.Agr. Sc. in 1961 from the University of Melbourne was awarded a Wool Research Committee Overseas Fellowship to study at the Hannah Dairy Research Institute. He obtained his Ph.D. at the University of Melbourne in March of this year.

Dr. J. S. Rogers has joined the Division of Physics where he will study thermal expansion at low temperature. Dr. Rogers, who graduated B.Eng. Physics from the University of Saskatchewan in 1954 and M.Sc. from the University of Alberta in 1962, was recently awarded a Ph.D. at the University of Alberta.



Dr. J. S. ROGERS

RED TAPE

An official in the British Foreign Office recently found a form waiting on his desk. He read it, initialled it, and passed it on. A few days later it was back on his desk with a note attached, which read "This form was not intended for you, kindly erase your initials, and initial your erasure."

Dr. W. H. F. Sasse has been appointed to the Division of Coal Research where he will work with the organic chemistry group. Dr. Sasse, who graduated B.Sc.(Hons.) in 1954 from the University of Adelaide, obtained his Ph.D. at the same University in 1956. From



Dr. W. H. F. SASSE

1956 to 1962 he was a lecturer in organic chemistry with the University of Adelaide, and since 1963 he has been senior lecturer in organic chemistry. During 1959 Dr. Sasse spent a year as research fellow at Harvard University. His research has been concerned with problems in the fields of heterocyclic chemistry, reactions of metal catalysts with organic compounds, and marine natural products.

Printed by CSIRO, Melbourne

OVERSEAS VISITS

Dr. J. C. Boray of the Division of Animal Health is at present visiting New Guinea and Papua where he will advise the Territory Administration on liver fluke in livestock. Dr. Boray will be away for two weeks.

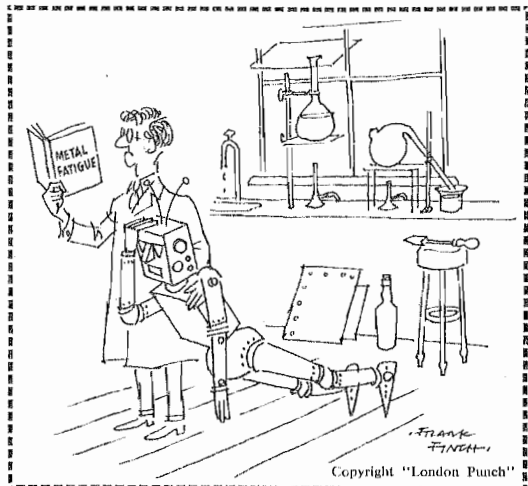
Mr. J. L. Farrant of the Division of Chemical Physics left last month for the U.S.A., to attend the Annual Conference of the Electron Microscopy Society of America at Detroit. After visiting research centres in the U.S.A. he will travel to the U.K., Holland, Germany, France and Italy.

Mr. G. B. Gresford, Secretary, is at present in New York attending the second meeting of the United Nations Advisory Committee on the Application of Science to Technology and Development. Mr. Gresford will return to Australia via

New Zealand where he will attend the 1964 meeting of the British Commonwealth Scientific Committee.

Mr. F. J. Lehany, Chief of the Division of Applied Physics, recently visited Japan, the U.K. and France. In Paris Mr. Lehany attended a meeting of the International Committee of Weights and Measures and the International Organization of Legal Metrology.

Mr. D. A. Little of the Division of Animal Physiology is at present in New Zealand where he is to spend four months studying pasture utilization at the D.S.I.R. Grasslands Research Division. Before returning to Australia in January, 1965, Mr. Little will also visit the Ruakura Animal Research Laboratory and Lincoln College.



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CORESEARCH

FOR CIRCULATION AMONG MEMBERS OF CSIRO STAFF — NUMBER 69, MELBOURNE, DECEMBER 1964

Brisbane Chief Wins £5000 Award

Dr. J. Griffith Davies, Chief of the Division of Tropical Pastures, has won the £5000 Britannica Australia award for natural and applied sciences.

The award, consisting of a gold medal, a diploma bearing a citation, and £5,000, is one of five which Encyclopaedia Britannica Inc. will make each year in recognition of outstanding contributions associated with Australia in the fields of art, education, literature, medicine, and science.

This is the first year of the award, which is made in each



Dr. J. G. DAVIES

of these fields for a contribution or development of outstanding merit originating in Australia, or having direct connection with or benefit for Australia.

Dr. Davies won the award for "his outstanding contribu-

tions to pasture science and hence to the pastoral industry and economy of Australia."

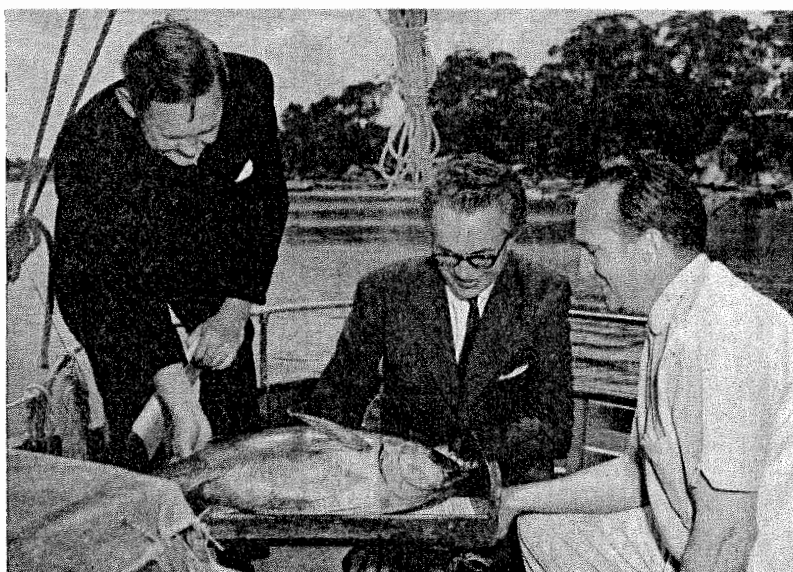
After gaining his Ph.D. at the University of Wales, Aberystwyth, Dr. Davies joined the Waite Agricultural Research Institute in 1928 as an agronomist.

In 1939 he was appointed Officer-in-Charge of the Agronomy Section of the Division of Plant Industry and built up around him a strong team of pasture research workers located at Canberra, Gatton, Armidale, Deniliquin, and Perth.

He became Associate Chief of the Division in 1952 and in 1953 was transferred to Brisbane to take charge of an expanded programme of pasture research in the summer rainfall areas of Australia.

In 1959 his group in Queensland became an independent Division, the Division of Tropical Pastures, and Dr. Davies was appointed Chief.

Dr. Davies was awarded the Australian Institute of Agricultural Science Medal in 1957 for his outstanding contributions to scientific agriculture within the Commonwealth, and in 1958 he was awarded the degree of Doctor of Science by the University of New England.



FISHERIES EXPERTS MEET

The Minister-in-Charge of CSIRO, Senator Gorton, last month officially opened a training centre on mackerel and tuna research at the Division of Fisheries and Oceanography, Cronulla.

The training centre, which was organized by the Food and Agriculture Organization of the United Nations, the Australian Government,

and Member Governments of the Indo-Pacific Fisheries Council, was attended by twenty fisheries scientists from overseas, and lasted four weeks.

Participants came from Burma, Cambodia, Ceylon, India, Indonesia, Japan, Korea, Malaysia, Pakistan, the Philippines, Thailand, and Vietnam.

The aims of the centre were to study modern methods of assessing mackerel and tuna stocks and to assess these in Indo-Pacific waters.

The Director of the Centre, Divisional Secretary Mr. G. R. Williams, said that assessment of the size of major fish stocks had only been possible in recent years, due mainly to the setting up by English research workers of a suitable model by which the dynamics of exploited populations could be displayed and measured, and to the development of electronic computers which made it possible to handle and analyze vast arrays of data.

The Associate Director of Training was Mr. J. Gulland of the Fisheries Research Laboratory, Lowestoft, England, who spent three months with the Division in 1962.

The training centre covered stock assessment and the related

mathematical and statistical methods and procedures for both mackerel and tuna.

The first week consisted of a revision course on mathematics, including elementary calculus and statistical theory.

In the second and third weeks lectures and practical exercises in sampling procedures were given, followed by lectures and seminars on fish population dynamics, including the treatment of data on growth, mortality, and recruitment in exploited stocks.

During this period participants worked through a number of examples using data for mackerel and tuna stocks which they brought to the training centre.

In the fourth week an attempt was made to evaluate the data obtained for mackerel and tuna stocks in the Indo-Pacific area.

Our picture shows (from left to right) Senator Gorton, Dr. V. Beerman, UNTAB representative in Australia and New Zealand, and Mr. J. S. Hynd of the Division of Fisheries and Oceanography examining a bluefin tuna on board the research vessel "Marelda".

Advisory Council Meets In Melbourne

The thirtieth meeting of the Advisory Council was held at Monash University, Melbourne, on the 10th and 11th of November.

The first morning was taken up with discussion on the Organization's Estimates for 1964/65, the building programme, the recent increases in Research Scientist's salaries, co-operative industrial research associations, the new administrative arrangements at Head Office, and research for the Australian mineral industries.

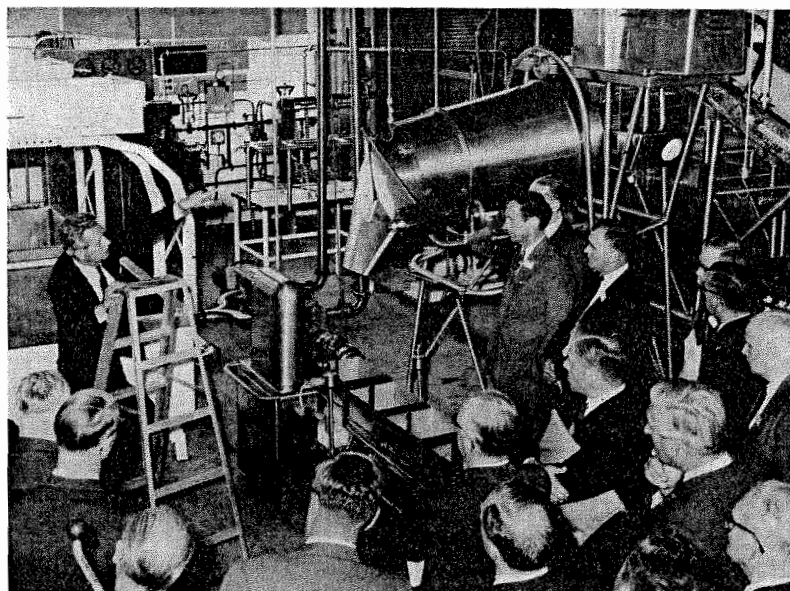
After a short tour of the University and lunch, Members of the Council went to Hiphett

where they saw something of the work being done by the Division of Dairy Research mainly in the fields of mechanized Cheddar cheese making, milk proteins, and flavour chemistry.

The following morning, the Chief of the Division of Meteorological Physics, Dr. C. H. B. Priestley, spoke about meteorological research in Australia, particularly the work of his Division.

The rest of the day was devoted to a series of talks and discussions by officers of several Divisions on research in the service of the coming pastoral revolution.

Below, Mr. J. Czulak of the Division of Dairy Research demonstrates to members of the Advisory Council the Bell-Siro Cheesemaker for cheddaring cheese curd.



APPOINTMENTS VACANT

The following vacancies for professional appointments are current:—

- RESEARCH SCIENTIST (CHEMIST) (RS/SRS), Division of Plant Industry, 130/629. (11/12/64).
- RESEARCH SCIENTIST (PLANT INTRODUCTION) (RS/SRS), Division of Plant Industry, 130/639. (31/12/64).
- RESEARCH SCIENTIST (INSECT BIOCHEMIST) (RS/SRS), Division of Entomology, 180/286. (31/12/64).
- RESEARCH SCIENTIST (RS/SRS), Division of Animal Physiology, 245/313. (31/12/64).
- SCIENTIFIC SERVICES OFFICER, (SSO 2/3), Division of Textile Industry, 464/347. (15/1/65).
- RESEARCH SCIENTIST (RS/SRS), Division of Organic Chemistry, 606/51. (31/12/64).
- ENGINEER (Eng 2/3), Division of Coal Research, 480/468. (18/12/64).
- EXPERIMENTAL OFFICER (EO 1/2), Division of Dairy Research, 410/137. (31/12/64).
- EXPERIMENTAL OFFICER (EO 1/2), Division of Animal Physiology, 245/314. (18/12/64).
- RESEARCH SCIENTIST (Physical Chemist), (RS/SRS), Division of Soils, 270/290. (11/12/64).

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Low Frequency Jazz

Mr. J. Waldersee of the Division of Applied Physics has just gone on record playing tuba with the Graeme Bell All Stars Jazz Group.

Mr. Waldersee, who belongs to the Division's Vibration Section, says, "The tuba has a frequency range of roughly 30 to 300 cycles, much the same range as we normally work with".

In his section, his 'tune-up' range extends from heavy industrial installations to radio telescopes. "All low frequency stuff."

His prowess with the tuba started some sixteen years ago when he was tutored by prominent Sydney trombonist, Harry Larsen.

Fostering his talents in his spare time, he played with the Ocean City Jazz Band for some years and occasionally answered the call for augmented instrumentation in the

Sydney Symphony Orchestra for special works in subscription and youth concerts under the direction of Sir Eugene Goossens, Nicolai Malko and Dean Dixon.

Graeme Bell's Festival L.P. release called 'LIVE' was recorded at Sydney's Chevron Hilton Hotel with the tuba (30-300 c/s) helping out in three of the numbers—"Irish Black Bottom", "Emperor Norton's Hunch", and "Balthazar".

Admitting his singular keenness for Dixieland music, Jim Waldersee feels that groups such as Louis Armstrong's Hot Seven and Kid Ory's Creole Jazz Band, produced recordings in the 1920's that have inspired followers of jazz down the years.

"There's a down trend at the moment", he said, "but wait until we get rid of these blokes with their guitars."

FOOD INDUSTRY MEETING

At a conference in Melbourne last month, officers of the Division of Food Preservation spoke to members of the food industry on recent developments in food technology.

Dr. J. R. Vickery, the Chief of the Division, discussed how industry could take advantage of the major savings in weight and bulk which dehydrated foods offered while retaining quality and convenience, and Mr. J. Shipton gave an assessment of the fluidized bed and liquid nitrogen techniques for freezing foods, from the point of view of versatility and economy.

The Assistant Chief of the Division, Dr. W. J. Scott, spoke about preserving food by irradiation, and Mr. J. F. Kefford discussed packaging.

Bibliography

A bibliography has just been published of the work undertaken by CSIRO between 1923 and 1963 in the field of water research. The bibliography was compiled by Miss L. J. Davey, Senior Librarian in the Head Office Library, in consultation with Mr. F. Penman, Irrigation Adviser.

Entries are arranged alphabetically according to subject and chronologically within subjects. An author index is also provided.

FOR WHOM THE BELL TOLLS

In practising an art that goes back more than three hundred years, Mr. G. Heyes of the Ore Dressing Laboratory has both a hobby and a sport which provide him with all the exercise he needs.

Mr. Heyes is captain of the bellringers at St. Paul's Cathedral in Melbourne.

He explained "One of the main satisfactions in bell ringing is the feeling you get from working well with a team and of producing music that is both different and interesting".

Towards the end of the 18th Century an English writer said of bell ringing, "Of all the Athletic Exercises or Amusements now in practice, there are none so ranked in the Circle of Sciences of so noble a Nature, so conducive to health and Employing so many Faculties, both mental and corporeal, as that of the Art of Ringing."

The serious or "noble" side of ringing is its place in the liturgy of the church—calling people to worship on Sundays.

The "mental faculties" most used are those of concentration and memory.

As for the "corporeal faculties", apart from the effort of ringing the bells, there is the strenuous climb up and down the spiral staircase to get to the ringing chamber—St. Paul's has 53 steps and St. Mary's Cathedral, Sydney, 111 steps.

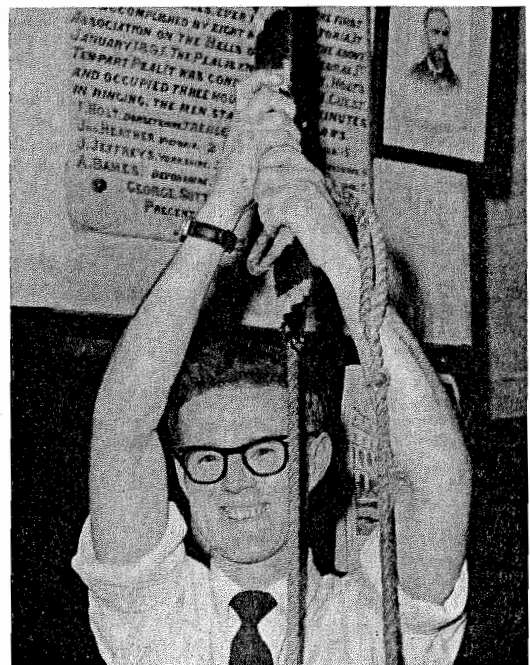
Mr. Heyes started ringing bells fifteen years ago in his home town of Ballarat. He came to Melbourne seven years ago and has been ringing at St. Paul's Cathedral ever since.

St. Paul's has the only peal of twelve bells outside the British Isles. They were cast in 1890 at the famous Whitechapel bell foundry in London, which dates back to 1570.

The bells are an excellent example of the founder's skill and vary in size from the treble, about 5 cwt., to the tenor of 3½ cwt.

It takes about a year to learn how to manipulate a bell—after that one only has to learn the music, which becomes more and more complex.

Music can be made on any number of bells from five to



twelve, although the best music comes from eight, ten, or twelve bells.

One of a ringer's great ambitions is to be a member of a team which rings a "change".

Ringling a change involves ringing a set of bells, usually eight or more, 5,040 or more times—nearly four hours of muscle-straining work.

It's such a great performance that St. Paul's ringing chamber has boards on the wall, dating to the last century, with the names of hardy men who took part in a change and saw it through to the last ring.

Bellringing began in England about 1630 and many of the changes were written in the next hundred years or so.

Readers of Dorothy Sayers's mystery story "The Nine Tailors" will be familiar with some of the fascinating names of these changes such as Grand-sire Triple, Stedman Cinques, Double Norwich Court Bob Major, and Oxford Treble Bob.

Writing music for bells is a strange cross between mathematics and music.

The basic idea is to use the different combinations, or order, in which the bells can be rung.

In Australia there are twenty-six peals of bells, five of which are unringable. To handle these there are about two hundred bellringers.

In England there are about 5,000 peals of bells and 50,000 ringers.

Very little change-ringing is practised outside England and Australia. There are about five towers each in Canada and New Zealand, four in Africa, two in America and the odd one or two scattered elsewhere around the world.

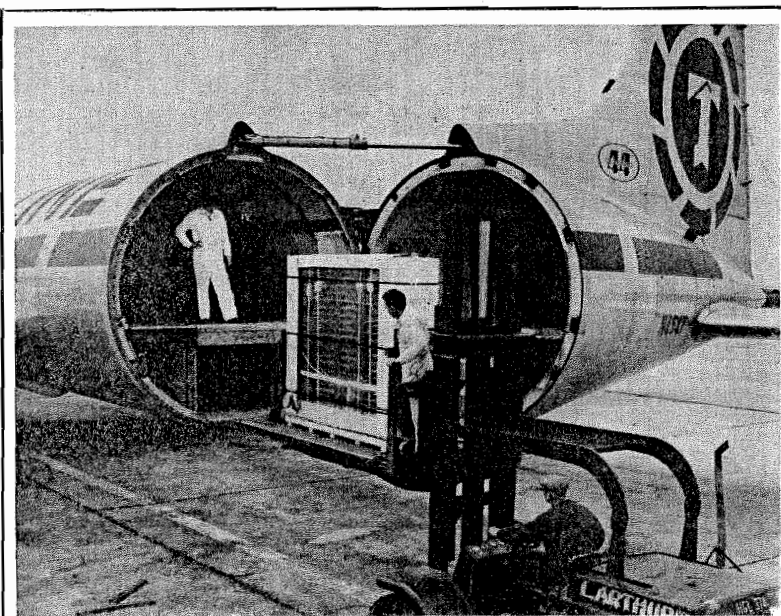
One prominent ringing-group in London is the Ancient Society of College Youths. This group, responsible for the bellringing at Westminster Abbey, St. Paul's Cathedral, and three or four other London Churches, had its origin in the Craft Guilds which followed the Industrial Revolution.

In fact it is the only Guild in existence today which still carries out the functions for which it was founded.

Bellringers in England have a reputation for retiring to the local after practice, but like so many other things bellringing is not what it was.

This ditty from a bellringer's jug of 1827 gives a hint of what bellringers in those days were like:

"When I am filled with liquor strong
Each man drink once and then ding-dong,
Drink not too much to cloud your knobbs
Lest you forget to make the bobbs."



A Control Data 3200 computer, which arrived in Melbourne last month from Minneapolis on a chartered Flying Tiger CL44 airfreighter, is shown here being unloaded. The computer and its peripheral equipment has now been installed in the new laboratory for the Division of Chemical Physics at Clayton, thus completing the Organization's computer network. The plane also carried a second Control Data 3200 and its peripheral equipment for Monash University, making Monash the first Australian University to have a computer that is compatible with the CSIRO network.

News In Brief

Doctorates

Dr. I. A. M. Cruickshank of the Microbiology Section of the Division of Plant Industry has been awarded the degree of Doctor of Science by the University of Canterbury, New Zealand. Dr. Cruickshank's thesis was entitled "Some physiological aspects of host-parasite relationships".

Dr. R. A. Duncan of the Upper-Atmosphere Section has been awarded the degree of Doctor of Science by the University of Adelaide for his work on the upper atmosphere, especially the ionosphere.

Honorary Fellow

Professor G. M. Badger of the Executive has been elected an Honorary Ex-Officio Fellow of the Chemical Institute of Canada during his term as President of the Royal Australian Chemical Institute.

Working Party Appointment

Dr. D. F. Martyn, Officer-in-Charge of the Upper Atmosphere Section, has been appointed to the joint working party of the International Antarctic Analysis Centre in Melbourne.

The centre, set up in 1959 by the Special Committee for Antarctic Research and the International Council of Scientific Unions, aims to investigate problems of Antarctic meteorology, to produce regular analyses of surface and upper air for the Antarctic and adjacent regions, and to develop new techniques of analysis.

B.C.S.C. Meeting

The British Commonwealth Scientific Committee Meeting for 1964, opened in Auckland, New Zealand, on Monday, 16th November. CSIRO was represented at the Meeting by Sir

Frederick White, Lord Casey, and Mr. G. B. Gresford. The Committee, which comprises the heads of research organizations of Commonwealth countries, meets every two years. The last meeting was at New Delhi.

Acting Director

Mr. J. F. P. James of the Division of Textile Physics has been seconded to the Australian Wool Testing Authority as its Acting Director. He will supervise its wool testing services to the trade until a permanent Director is appointed early next year.

The Authority's services operate in fourteen wool-selling centres throughout Australia—in Sydney, Newcastle, Goulburn, Albury, Melbourne, Geelong, Ballarat, Portland, Brisbane, Adelaide, Fremantle, Albany, Hobart, and Launceston.

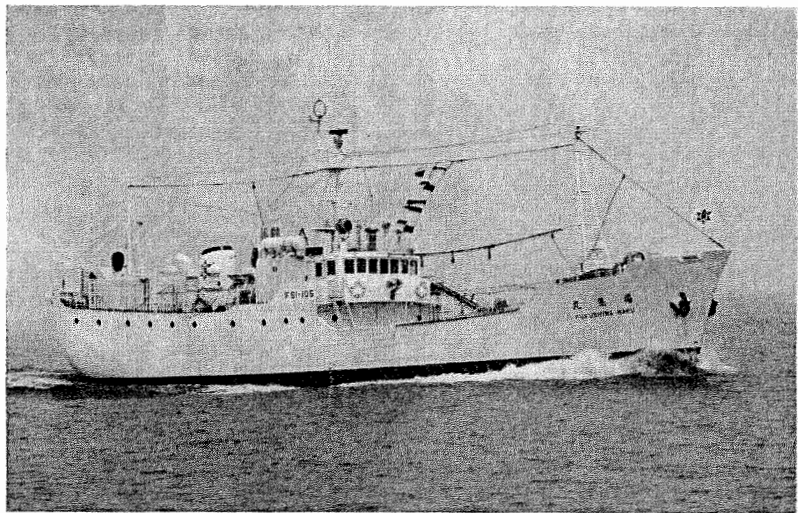
Rockefeller Grant

Dr. R. M. Moore, Assistant Chief of the Division of Plant Industry, has been awarded a 2,700 dollar grant by the Rockefeller Foundation to enable him to spend three months early next year at U.S. research centres. Dr. Moore is already overseas and will shortly attend the Ninth International Grasslands Congress in Brazil.

Prizewinner

Mr. W. Hastie of the Division of Forest Products attributes some of his success at growing roses to the use of wood shavings in the heavy clay soil of his garden.

Mr. Hastie won four first prizes and one second at the National Rose Society Spring Rose Show in Melbourne last October, and followed this a week later by winning five firsts, one second, and "Best Exhibit of the Day" at the Chadstone (Victoria) Rose Show.



LONGLINING FOR TUNA

Although adult stocks of southern bluefin tuna are known to exist well offshore from Australia in the Indian Ocean and the Tasman Sea, the absence in this country of a suitable research or commercial vessel has restricted work on them.

As a result current Australian research on the southern bluefin tuna has been confined almost exclusively to the juvenile stocks inhabiting the coastal waters of New South Wales, South Australia and Western Australia.

Recently, however, as a result of negotiations with the Nankai Regional Fisheries Research Laboratory, in Kochi, Japan, Mr. T. R. Cowper of the tuna research section of the Division of Fisheries and Oceanography was able to spend five weeks on board the Japanese fisheries training vessel "Fukushima maru" on a tuna longlining cruise in the Tasman Sea.

The "Fukushima maru" is a small (300 tons, 130 foot), but very modern, all steel, tuna longliner owned by the Onahama Fisheries High School of Fukushima Ken.

Altogether there are some fifty six Fisheries High Schools in Japan, though not all of them have their own training vessel.

In addition to the normal fishing crew of twenty five, the "Fukushima maru" carried an instructor and twenty seven students.

Most of the students were in their third and final year of

training as fishermen or marine engineers and would ultimately join vessels of the Japanese tuna fleet. Ten of the students were completing five years at Fisheries High School and would qualify as Second Officers or Third Engineers.

The "Fukushima maru" was equipped to work some 400 baskets (60 miles) of gear. These were set and hauled each day when on the fishing grounds.

Although not a fisheries research vessel, she was equipped with an oceanographical winch for bathythermograph casts and hydrological sampling, and carried planktonological gear for sampling tuna larvae.

Remote control of steering and engine from one bridge position greatly facilitated manoeuvring of the vessel when hauling buoys.

Weather charts, broadcast three times a day from the Bureau of Meteorology in Canberra, were reproduced on board by a facsimile machine and proved useful in planning fishing operations.

News items from Japan were received and printed by the same machine providing a newspaper three times a day.

The "Fukushima maru" was able to load about seventy tons of tuna in two refrigerated ice-holds and one freezer compartment.

Fishing was not particularly good on the first part of the voyage. After twenty five fishing days in the Tasman Sea, the total catch of southern bluefin was only about forty tons. However, it was hoped that she would top up with yellowfin on her return passage to Japan.

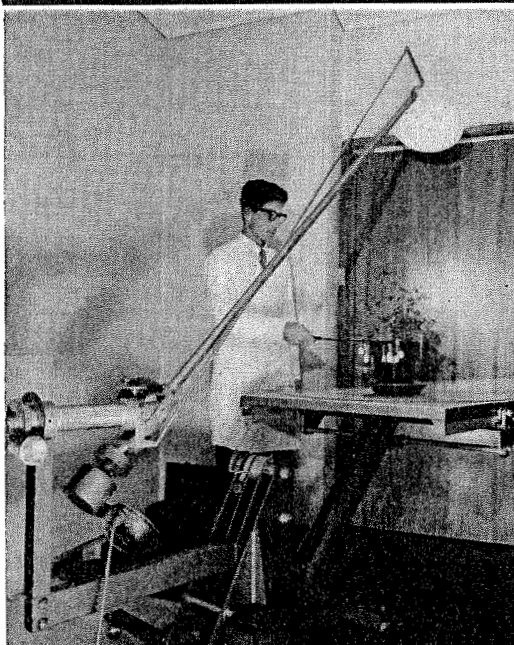
Biological samples of blood, stomachs, and ovaries taken from southern bluefin caught during the cruise will be used to supplement information already obtained from fish taken in the Australian coastal fishery.

It is hoped that further cruises of this kind can be arranged to allow progress to be made in the determination of spawning seasons and areas and to help fill in some of the gaps in our knowledge of this important species.

Above. The Japanese fisheries training vessel "Fukushima maru".

Below. Japanese students and crew hauling the longline.

ARTIFICIAL SUN



This solaroscope, which was bought by the Division of Land Research and Regional Survey with a grant from Mr. F. C. Pye, a prominent New South Wales grazier, is being used for basic studies of the environment of plants grown in northern Australia. The solaroscope simulates the position of the sun at different latitudes, at different times of the year, and at different times of the day. Here Dr. W. R. Stern is measuring the amount of light from the solaroscope reaching ground level through Townsville lucerne.

U.S. Grant

The Charles F. Kettering Foundation of Dayton, Ohio, has made a grant of 14,000 dollars to Dr. R. M. Smillie, leader of the Plant Physiology Unit of the Division of Food Preservation, in support of his research on photosynthesis in plants.

This is the second grant Dr. Smillie has received from the Kettering Foundation; in 1963 he was given 18,500 dollars.

Both grants have been used to purchase equipment, including a Chance dual-wave spectrophotometer which can measure very small spectral changes in chloroplasts.

The Foundation has also made a grant of 7,500 dollars to enable Dr. Louise Anderson of the Department of Microbiology, Dartmouth Medical School, Hanover, New Hampshire, U.S.A., to spend twelve months working with Dr. Smillie on the biochemistry of chloroplasts and their development.



Overseas Visits

Mr. A. M. Downes of the Division of Animal Physiology left Australia recently for the U.S.A. where he will spend a year working with Professor A. G. Matoltsy at Boston University, studying the biosynthesis of keratin. During this period Mr. Downes will attend the Third International Wool Textile Research Conference in Paris and will visit research centres in the U.K.

Dr. J. N. Ladd of the Division of Soils visited the U.S.A. last month where he attended a special conference on the chemistry and metabolism of L- and D-lactic acids, which was sponsored by the New York Academy of Sciences. Dr. Ladd will visit research centres in the U.S.A. before returning to Australia later this month.

Dr. R. Milford of the Division of Tropical Pastures will leave Australia early this month for Africa where he will visit research centres, concerned with pasture and animal husbandry work in both wet and dry areas in Nigeria and Ghana. Dr. Milford will then attend the Ninth International Grassland Congress in Sao Paulo, Brazil, and visit research centres in South America. He

will return to Australia via the U.S.A., Canada, the Philippines and Formosa.

Dr. A. L. G. Rees, Chairman of the Chemical Research Laboratories, will leave Australia early this month for the U.S.A. where he will attend an Executive Committee Meeting of the International Union of Pure and Applied Chemistry, at Austin, Texas. Dr. Rees will also visit Kingston, Jamaica for discussions with members of the Jamaican Scientific Research Council. He will return to Australia via Mexico.

Dr. G. M. H. Waites of the Division of Animal Physiology will leave Australia for the U.K. where he will visit institutes working in the field of reproductive physiology. In January, 1965, Dr. Waites will commence working at the Station de Recherches de Physiologie Animale at Jouy-en-Josas, Paris, France, where he is to spend twelve months with Drs. Thibault and Ortavant.

Mr. G. W. Walls of the Division of Textile Industry left last month for the U.S.A. to visit the firm of Warner and Swasey to discuss the Division's sliwer converter project. Mr. Walls will also visit the U.K. and Japan.

APPOINTMENTS TO STAFF

Mr. B. Cartwright has joined the Division of Soils where he will take part in a research programme on the role of copper and cobalt in nitrogen fixation in legumes. Since graduating B.Sc., from the University College of Wales, Aberystwyth, in 1961, Mr. Cartwright has been at the University of



Mr. B. CARTWRIGHT

Nottingham studying the copper requirements of the root nodules of subterranean clover.

Mr. J. R. Egerton has joined the Division of Animal Health where he will assist in a programme of research into the pathogenesis of footrot in sheep. Mr. Egerton graduated B.V.Sc., from the University of Brisbane in 1955. Since then he has worked with the Department of Agriculture, Stock and Fisheries, Papua. He obtained an Academic Post Graduate Diploma in Bacteriology from the University of London in 1961.

Dr. J. C. Macfarlane has been appointed to the Division of Applied Physics where he will take part in the Division's programme of applying and refining modern developments in physics in order to achieve better standards of physical measurement. After graduating B.Sc., from the University of Glasgow in 1958, Dr. Macfarlane spent two years as a physicist with the U.K. Atomic Energy Authority. Since 1960 he has been carrying out research on dielectrics at the University of Glasgow, where he recently obtained his Ph.D. His thesis was concerned with the dielectric properties of thin alkali halide films.

Dr. A. T. Pawlowicz has joined the Division of Physics where he will take part in the Division's research into the properties of solids, particularly at low temperatures. Dr. Pawlowicz graduated B.Sc., from the University of London in 1961 and since then has been a research assistant in the Department of Physics at the Imperial College, London. He recently obtained his Ph.D. from the University of London. His thesis was entitled "Electron diffraction investigations using a liquid helium cryostat".

Dr. R. Frater has been appointed to the Division of Protein Chemistry where he will work on the structure of fibrous proteins, peptides, and amino acids before and after chemical modification. After graduating B.Sc., from the University of Melbourne in 1957, he spent two years as a research assistant at the University's Pharmacology Department working on problems involving ionic balance in muscle tissue. He



Dr. R. FRATER

obtained his Ph.D., from the University of Melbourne in 1962 for work on the sulphur chemistry of flour proteins in relation to the physical behaviour of dough. Since 1963 he has been working firstly at the University of Utah and then at the University of California on the structure of the enzyme papain.

Dr. J. A. Roberts has been appointed to the Division of Animal Health where he will work on immunological problems relating to the health and productivity of livestock in Australia. After graduating B.V.Sc., from the University of Queensland in 1956, Dr. Roberts established a contract veterinary practice in a sheep and beef cattle district. In 1959 he was awarded a Research Scholarship in the Department of Microbiology at the Australian National University and in 1962 he obtained his Ph.D., for work on the histopathogenesis

of mousepox. Since 1962 he has been working at the Veterinary Virus Research Institute of Cornell University under the auspices of the Australian Cattle and Beef Research Committee.

Dr. M. A. W. Thomas has joined the Division of Protein Chemistry where he will collaborate with other members of the Division in research on the structure of fibrous proteins, peptides, and amino acids, before and after chemical modi-



Dr. M. A. W. THOMAS

fication. After graduating B.Sc., from the University of Sydney in 1959, Dr. Thomas undertook research on mucoproteins, first at the University of Sydney, and then at the Australian National University. Since 1960 he has been working in the Department of Biochemistry at Oxford University and was recently awarded the degree of D.Phil. for his research on the unreactive sulphhydryl groups of human haemoglobin.

Dr. M. Whitfield has been appointed to the Division of Fisheries and Oceanography where he will initiate studies on the effect of pressure on reactions occurring in the sea, in particular those concerned with the processes involved in primary production and with the growth, metabolism, and decomposition of phytoplankton. Dr. Whitfield graduated B.Sc., from the University of Leeds in 1961 and recently obtained his Ph.D. from the same university. His thesis was entitled "The phase relationships and reactivity of certain nitrides at high temperatures and pressures".

THOUGHT FOR THE MONTH

"This book explains nuclear physics in simple language that can be understood by laymen." I read the words with some irritation, and showed them to another layman.

"He agreed that they were typical of the condescending attitude adopted towards us by experts."

From an article, "The Lay of the Land" by Ross Campbell of "The Bulletin".

"The layman is always referred to as a person of boundless ignorance. His only apparent function is to have things explained to him. His intelligence is so low that he must be addressed in simple language."

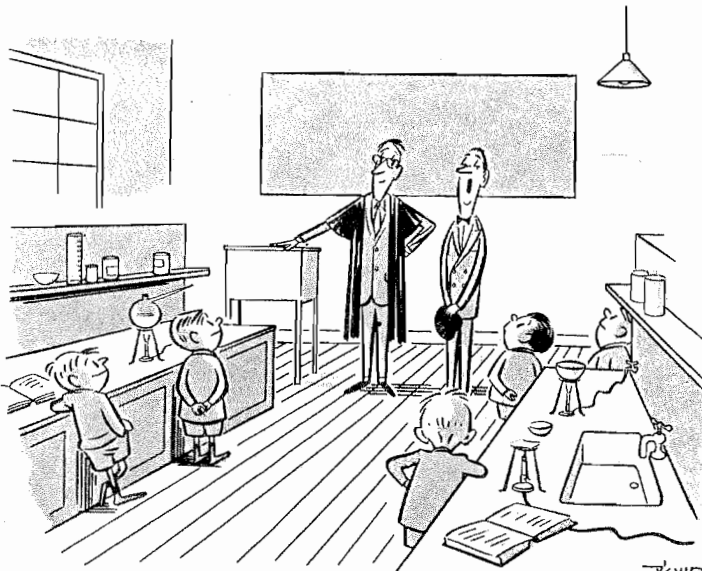
"However much he is told, he is never given credit for grasping it or remembering it. The layman's job is to remain uninformed, while at the same time being passionately eager for information."

"Laymen could retaliate by writing books or articles themselves, but they are under a disadvantage. People will not listen to a layman because he is not an expert at anything."

"Yet there is one subject, at least, which he knows something about—himself. The layman is an authority on laymen."

"It is here, I think, that he has the best chance of raising himself to a position of greater respect."

"I would like to see a solid piece of research done, entitled The Australian Layman: A Sociological Survey. It would say on the jacket, 'This book is written in turgid, technical language that can be understood by experts.'"



"And we at the CSIRO feel confident that the future of our great country lies safely in the hands of you science chaps."

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Mountain Holiday

Several years ago a group of employees from the Division of Building Research in Melbourne formed a Building Research Holiday Club and bought a house at Mt. Beauty just over 200 miles by road north east of Melbourne at the head of the Kiewa Valley.

Since then the Club has made many improvements to the three bedroom home which is fully furnished and can accommodate eight people.

Vacancies are available for non members for periods other than school holidays at 8 guineas a week.

Fishing, golf, bush walking, swimming, skiing are but some of the many attractions which the area offers the holiday maker.

Further information may be obtained from Mr. D. Crook, Division of Building Research, Graham Road, Highett, telephone 95 0331, Extension 279.

Indian Visitors

Dr. B. P. Pal, Director of the Indian Agricultural Research Institute, **Dr. Y. Nayudamma**, Director of the Indian Central Leather Research Institute and **Mr. K. G. Krishnamurthi** of the Indian National Aeronautical Laboratory visited Australia last month, on route to the B.C.S.C. Meeting in New Zealand.

Dr. Pal was a guest of the CSIRO at the Advisory Council Meeting at Monash University, and spent two days at Canberra where he visited the Divisions of Plant Industry and Land Research and Regional Survey.

Dr. Nayudamma and **Mr. Krishnamurthi** visited the Division of Coal Research, the Chemical Research Laboratories and the Division of Protein Chemistry.

Printed by CSIRO, Melbourne