046##1963

CORESEARCH

FOR CIRCULATION AMONG MEMBERS OF C.S.I.R.O. STAFF — NUMBER 46, MELBOURNE, JANUARY 1963

Salary Rises in E.O. Ranges

The salaries of Experimental Officers have been the subject of protracted negotiation and arbitration proceedings during most of 1962. These negotiations were virtually concluded on 13th December.

The following rates of pay were arrived at for Experimental Officers engaged on experimental work.

E.O. Class 1 — £1,243 Diplomate (non-engineering).
£1,298 Third-year graduate or diplomate (engineering).
£1,438 Fourth or fifth year graduate.
£1,578-£1,738-£1,918-£2,098.
E.O. Class 2 — £2,198-£2,298-£2,398-£2,498.
E.O. Class 3 — £2,618-£2,738-£2,858-£2,978.
E.O. Class 4 — £3,098-£3,218-£3,338.

The designations of Experimental Officer Grades 1-3 and S.E.O. have been superseded by the designations Experimental Officer Classes 1-4. Class 4 will continue to be the maximum of the normal career range for Experimental Officer.

It was expected when "Coresearch" went to press that these new rates would be implemented by way of a Consent Determination issued by the Public Service Arbitrator. The appropriate steps were being taken to bring about this Determination as quickly as possible.

The date of effect will be the commencement of the pay period immediately following the date the Arbitrator issues his Determination.

However, the various Staff Associations concerned may make application to the Arbitrator for a further hearing on the question of retrospectivity.

Functions of the E.O.

During the course of the negotiations leading to the new salaries, it was necessary to define the functions of an Experimental Officer with some precision, and the Experimental Officer classifications, as now described, are reserved to those engaged on experimental work.

Officers and employees hitherto classified as Experimental Officer, but not engaged on experimental work will be classified in newly introduced designations of either:

(a) **Engineer** —
- **Class 1: £1,298-£1,438-£1,578-£1,918-£2,098 (N);**
- **Class 2: £2,248-£2,348-£2,448-£2,548;**
- **Class 3: £2,698-£2,818-£2,938-£3,058;**
- **Class 4: £3,208-£3,328-£3,448;**

or

(b) **Scientific Services Officer** —
- **Class 1: £968-£1,023-£1,078-£1,133-£1,188-£1,243-£1,298-£1,353-£1,408-£1,463-£1,518;**
- **Class 2: £1,518-£1,573-£1,628-£1,683-£1,739-£1,793-£1,848;**
- **Class 3: £1,968-£2,033-£2,098-£2,163-£2,228.**
- **Class 4: £2,358-£2,423-£2,488-£2,553-£2,618;**
- **Class 5: £2,748-£2,878-£3,008-£3,138.**

The Executive will consult with Chiefs and Officers-in-Charge and come to a decision as to those officers and employees who will transfer to these new classifications (E.O., Engineer and S.S.O.) as soon as possible.

The rates of salary prescribed for the designation of Engineer are the new rates for Engineer prescribed by the Commonwealth Conciliation and Arbitration Commission.

Placement within the classes will be made in accordance with the definitions adopted by the Arbitration Commission in Determination 29 of 1962, and adjustment of salaries will be made on a similar basis to that obtaining generally in the Commonwealth Service. Full details of the designations will be promulgated at an early date.

With regard to the designation of Scientific Services Officer the Executive regrets that it is impracticable to do other than maintain existing salary rates for the time being.

However, the Executive wishes to assure the staff that every effort is being made to obtain new salary rates for this classification as soon as possible.

Information regarding the date of effect, method of adjustment and other relevant matters affecting the new Experimental Officer scales will be formally issued as soon as it becomes available.

The salaries of Research Officers, Research Liaison Officers, Translators, and Scientific Librarians are still to be considered. The Executive is also proceeding with these as quickly as possible.

Dr. J. L. PAWSEY DIES

Dr. Joseph Lade Pawsey, Assistant Chief of the Division of Radiophysics and one of Australia's most honoured scientists, died on 30th November last, after a prolonged illness, at the comparatively early age of 54.

Dr. Pawsey had a distinguished academic record at the Universities of Melbourne and Cambridge.

He obtained his M.Sc. with first-class Honours in Physics in 1931 and was awarded an 1851 Exhibition, which enabled him to proceed to Cambridge where he carried out research into the ionosphere at the Cavendish Laboratory, under Lord Rutherford.

He took his Ph.D. degree in 1935 and then joined Electrical and Musical Industries Ltd., London, as a research physicist.

He was involved in research on aerial problems connected with pre-war television services in Great Britain until he returned to Australia in 1940, to join the newly-created C.S.I.R. Division of Radiophysics, which had been set up to carry out research and development in the then new and secret field of radar.

Throughout the war he played a prominent part in the radar research carried out by the Division, and was responsible for developing new techniques in the ultra high frequency and microwave regions and for the planning of many of the important projects undertaken.

As the pressure of wartime work eased Dr. Pawsey turned his attention to the study of the high intensity radio waves which radar observers had reported as apparently coming from the direction of the sun and, in 1945-46, was involved in some of the exciting discoveries — that the sun's corona is enormously hotter (1,000,000°) than had previously been supposed, and that extremely powerful radio waves are sometimes emitted from the vicinity of sunspots — that marked the beginning of modern radio astronomy.

He became founder and leader of a group within the Division of Radiophysics which, under his guidance and inspiration, has been active over almost the entire field of radio astronomy and has won for Australia a world-wide reputation.

Dr. J. L. PAWSEY

In December, 1961, Dr. Pawsey was invited to accept the position of Director of the U.S. National Radio Astronomy Observatory at Green Bank, West Virginia, and he had planned to take up this new appointment towards the end of 1962.

The tragic illness which was finally responsible for his death developed in March, 1962, while he was in the U.S.A. on a preliminary visit to Green Bank.

Dr. Pawsey, a Fellow of the Royal Society and a Foundation Fellow of the Australian Academy of Science, was a recipient of many honours, the last of which — the Hughes Medal of the Royal Society — was conferred on him only a few weeks prior to his death.

Always delightfully modest and unassuming, he was generous in the advice and guidance he gave, especially to the younger members of his team; and many whose scientific reputations are now well established owe much to his kindly criticism, wise counsel and continuing encouragement.

A man of great intellectual honesty, scientific insight and sound judgement, he was an inspiring leader in the field of research to which he had dedicated himself.

His untimely death is a grievous loss to science and to Australia, and a very personal one to his many friends and colleagues.—A.J.H.

SURVIVAL TENT

Firefighters trapped by bushfires could owe their lives to a new survival tent which has been developed by Dr. A. R. King of the Bushfire Research Section.

This tent has an aluminium foil surface to reflect radiated heat — the main hazard to life in a bushfire. It is self-supporting and covers a man while he is lying on the ground.

Measurements of air temperature and heat radiation intensity near large, violent flame fronts have indicated that heat is transferred to the cool surroundings by heat radiation and not by the convection of hot air.

In fact, the air temperature within ten feet of the ground and within a few feet of flames which are ten to thirty-five feet high will be less than 30°F. higher than elsewhere.

In this position the heat absorbed by a firefighter is only about 0.02 calories per square centimetre per second compared with the 0.5 to 0.8 calories per square centimetre per second received as heat radiation.

Although it is unpleasant to breathe, air at 200°F. can be breathed and borne by the body for half an hour, and at 500°F. for three minutes.

The length of time during which trapped persons are subjected to intense radiation has never been measured, but observations on large moving flame fronts show that violent flaming, and thus intense radiation, persists for only one to two minutes.

When violent flames form a virtual hemisphere over a clearing — for example, over a firebreak one chain wide in a pine plantation — the radiation intensity experienced by persons trapped in it would be great enough to cause excruciating pain in exposed skin within two seconds and lead the victims to panic and run, as so often happens.

The use of a survival tent, however, can make such a situation bearable for a trapped person who, if unprotected, would have been screaming with pain some minutes before conditions again became tolerable.

Tests carried out by Dr. King have shown that a man under the survival tent suffers comparatively minor discomfort, even when only feet away from flames between ten and thirty feet high.

Melbourne Regional Office

The administrative staff at 314 Albert Street, East Melbourne, is being split into two groups. One will be a Head Office group, comprising the Executive, the Secretariat, and a relatively small number of officers who deal with policy matters.

The second group will constitute the Melbourne Regional Office. Its functions will be similar to those of the Regional Offices at Canberra and at Sydney.

It will provide a variety of services to Division and Sections in Victoria, South Australia, Western Australia, Tasmania and the Northern Territory. It will include a number of sections, including Records, Expenditure, Orders and Transport, Stock Records, and Salaries.

The Melbourne Regional Office will be in the charge of Mr. Alan Patterson, who was formerly in charge of the Expenditure Section at Head Office.

Alan Patterson, who is aged 44, joined C.S.I.R.O. in 1934, as a boy of 16. He qualified for admission to the Australian Society of Accountants in 1939, and is now a Fellow of the Society.

He has spent 18 years in various sections at Head Office, and has also had service with the Sydney Administrative Office and with the Chemical Research Laboratories.

He will be called the Regional Administrative Officer (Melbourne). Simultaneously, the titles of Messrs. K. J. Prowse and F. J. Whitty will be changed respectively to Regional Administrative Officer (Canberra) and Regional Administrative Officer (Sydney).

Mr. A. PATTERSON

Wood Technologist

Dr. N. C. Franz, Associate Professor of Wood Technology at the School of Natural Resources, University of Michigan, will spend from February to August with the Division of Forest Products.

He will work with Dr. W. M. McKenzie's group on basic aspects of wood machining, a field in which he has been a pioneer.

He has also been concerned with novel approaches to wood processing.

ref 607(085.3)rc (COR)

OVERSEAS VISITS

Dr. W. Bottomley, of the Division of Plant Industry, left recently to spend eighteen months in the United States. He will spend a year in the Chemistry Department, University of California, and six months in the Department of Botany at Yale. He will be working with Professors Giessman and Galston, both of whom have recently worked in Australia.

Dr. R. G. Chittleborough, of the Division of Fisheries and Oceanography, has just returned from Seattle in the United States. He attended the second meeting of the Scientific Workshop of the International Whaling Commission.

Mr. F. de Silva, a Technical Assistant with the Division of Meteorological Physics, left Melbourne last month for Macquarie Island. He is a member of the 1963 Antarctic Research Expedition and will spend approximately a year at Macquarie Island. The main purpose of his visit is to carry out an intensive programme of ozone observations.

Mr. H. Lloyd Davies, of the Division of Plant Industry, left recently on a six-months visit to Europe and North America. He will visit centres of agricultural research in Britain, France, Sweden, Canada, U.S.A. and New Zealand.

Dr. D. F. Martyn, Officer-in-Charge of the Upper Atmosphere Section, made a short visit to Europe and America last month. He represented UNESCO at a meeting of the World Meteorological Organization Working Group in Geneva, and spent a few days with the U.S. National Aeronautics and Space Administration in Washington.

Dr. G. R. Moule, of the Division of Animal Physiology, is at present engaged on a Colombo Plan assignment in India. He is advising the Indian Government on the development of their sheep and wool industry.

Dr. R. F. Riek, of the Veterinary Parasitology Laboratory, Yeerongpilly, has just returned from a short visit to Cairo. He attended a meeting of the F.A.O. Expert Panel on Tick-Borne Diseases, of which he is a member.

Dr. J. A. Roberts, of the Division of Radiophysics, is at present visiting the United States and Europe. He has attended a N.A.S.A. symposium on "Non-Thermal Radio Sources" in New York, and will attend a conference at the Royal Greenwich Observatory in England this month.

Dr. G. B. Sharman, of the Division of Wildlife Research, leaves this week on a visit to Europe and America. Later this month he is going to Houston, Texas, where he has been invited to read a paper to a symposium on delayed implantation at Rice University. On his way home he will inspect marsupial populations in Hawaii and New Zealand.

Another Industry Fund?

A Commonwealth-wide slaughter tax of 9d. a head on pigs to finance research and promotion in the pig industry will be sought by the Australian Pig Society.

An outline of the plan was prepared by the Federal council of the society at its annual meeting in Devonport, Tasmania, recently and will be submitted to the Minister for Primary Industry (Mr. Adermann) soon.

It is estimated that a 9d. tax on all pigs slaughtered in the Commonwealth would yield about £70,000 a year.

Main points of the proposed plan are:

- A tax of 9d. a head on all pigs slaughtered.
- The greatest proportion of the money to be used for research, with the proportions allocated to research and promotion to be decided by representatives of the pig industry and the Department of Primary Industry.
- The fund to be administered by representatives of the pig industry under the chairmanship of a Department of Primary Industry nominee, preferably a veterinarian, and composition of the controlling body to be decided by representatives of the pig industry and the department.
- Money to be allocated to the States for work on a State level and to the C.S.I.R.O., universities and other appropriate bodies on a Commonwealth level.
- Machinery clauses for subsequent promotion of the pig industry to be drawn up at a later stage.

The meeting also decided to ask C.S.I.R.O. to investigate the possibility of shortening the time of bacon curing without undesirable effects on keeping qualities with the object of reducing costs of production.

TECHNICAL ASSOCIATION NEWS

Association Statistics

By courtesy of Head Office, the Association has been given a list of technical staff employed at October, 1962. There are 1426 persons listed and they range from Assistant Grade I to Senior Technical Officer Grade IV. The proportion of each class is given below:

*Assistant I	8.1%	10.6%
Assistant II	2.5%	
*Technical Assistant I	34.7%	64.3%
Technical Assistant II	18.5%	
Technical Assistant III	11.1%	
Technical Officer I	10.0%	15.4%
Technical Officer II	5.4%	
Senior Technical Officer I	3.5%	5.3%
Senior Technical Officer II	1.8%	
*Library Assistants (all grades)	3.2%	4.4%
*Special Measuring and Drafting Assistants	1.2%	

* These classes include Juniors.

These figures show some interesting trends, and the Association now intends to analyse length of service, age, Division and other factors in relation to classification.

Grant of $16,600

The United States Department of Health, Education and Welfare has given a grant of $16,600 to Dr. Bruce Griffing and Dr. John Langridge of the Genetics Section, Division of Plant Industry.

The grant will be used to finance two studies. The first concerns the physiological and genetic bases of heterosis. The second concerns the study of competition among related genotypes with special emphasis on homeostatic properties of populations composed of single or mixed genotypes.

The experimental organism and methods to be used in these studies are of special interest. A plant called *Arabidopsis thaliana* will be used as the biological test material.

It is one of the most rapidly developing flowering plants known. Some strains will flower in only ten days after germination.

This rapid development enables the plants to be grown throughout their life cycle on sterile, chemically defined, medium in ordinary test tubes. *Arabidopsis* is an ideal organism for model experiments concerning complex genetic phenomena.

Mr. L. J. Lynch Honoured

Mr. L. J. Lynch, Officer-in-Charge of the Canned Foods Section of the Division of Food Preservation, was honoured recently by the Hawkesbury Agricultural College Food Technology Association at a dinner at the N.S.W. Leagues Club.

The occasion marked the 10th anniversary of the graduation of the first diplomates in Food Technology from the College.

Mr. H. R. Richardson, former Principal, and Mr. B. Doman, present Principal of the College, spoke of Mr. Lynch's continued keen interest in the course as external examiner, and of his important role in encouraging the establishment of the Food Technology course, in drawing up the syllabus, and in planning the facilities.

Mr. Graham Thompson, a member of the first graduating class, paid tribute to Mr. Lynch's unfailing helpfulness to all Hawkesbury Food Technology diplomates throughout their careers, and presented him with an electric razor and a handsome desk set in tooled leather.

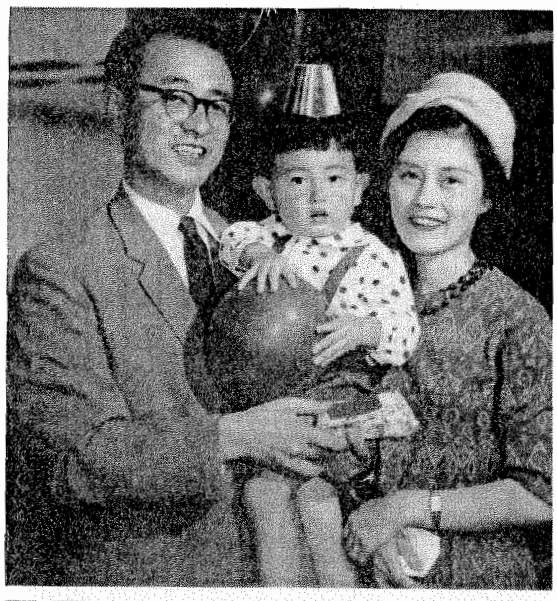
Three More Doctorates

Mr. R. G. Vines, of the Division of Physical Chemistry, has been awarded the degree of Doctor of Science by the University of Melbourne, in recognition of his work on thermal properties of gases at high temperatures and pressures.

The University of Melbourne has conferred the degree of Doctor of Philosophy on **Mr. G. W. Hill,** of the Division of Mathematical Statistics, and **Mr. T. A. Pressley,** of the Division of Protein Chemistry.

Mr. Hill's thesis was entitled "Advanced programming of digital computers", and Mr. Pressley's was entitled "Textiles and hospital hygiene".

"And When I



t Comes, It Brings Good Cheer"

Christmas has been celebrated in C.S.I.R.O. laboratories with many parties. The accent has been on children's parties which, in many laboratories, are becoming an annual institution.

All over Australia members of the staff have been turning on Father Christmases, lemonade, ice cream, sweets, toys, films and pony rides for the rising generation.

One of the first of the children's parties was held on 8th December at the **Division of Fisheries and Oceanography.** The Division's Social and Welfare Club held a party at the laboratory which was attended by staff members' children.

The 120 children who attended were entertained with games organized by Peter Hopwood while awaiting the arrival of Santa Claus. Each child received a present from Santa Claus, ice cream, drinks, cakes and sweets, and all seemed to have a very enjoyable afternoon.

On the same day, the **Division of Forest Products** held a children's Christmas party with an international flavour. Among the children were David and Ruth Addo-Ashong, children of Mr. F. W. Addo-Ashong of Ghana, who is at the Division for a period of two years.

Dr. and Mrs. Koichiro Isoi brought their son, Toshiyuki. Dr. Isoi is also at the Division for two years.

At Geelong, the staff of the **Division of Textile Industry** turned on a party for sixty-five of their own children and seventy-five children from the St. Catherine's, St. Augustine's and Glastonbury Orphanages.

Father Christmas was Jim Atkins from the Division's workshop. Naturally, Jim was dressed all in wool — even his twelve inch long beard was taken direct from a Lincoln fleece.

Eighty members of the staff turned up to help Jim with the children and to show a special programme of children's films.

As usual, the organizers of the **Head Office** children's Christmas party invited twenty children from an orphanage to come and join in the fun with the seventy children belonging to the staff. This year's children came from St. Antonian's Orphanage in Richmond.

A popular attraction at the **Division of Protein Chemistry's** party was a trampoline, which ran hot all afternoon.

In Adelaide the Waite Club, a joint social club comprising the staffs of the **Waite Institute,** the **Division of Soils** and the **Wine Research Institute,** held a children's party on 14th December.

On the following day the **Division of Plant Industry** organized a children's Christmas party at "Ginninderra" Field Station.

Most of the adults' parties were held nearer to Christmas Day. The exception was the Christmas get-together of the **Division of Coal Research,** which was held on 28th November.

The function was a Cabaret Dinner held at Grace Bros. new Crystal Ballroom at Chatswood, and the success of the evening was ensured by the enthusiastic organization of Mr. John Stephens, assisted by Misses Pam Rosevear and Lynne Wilson.

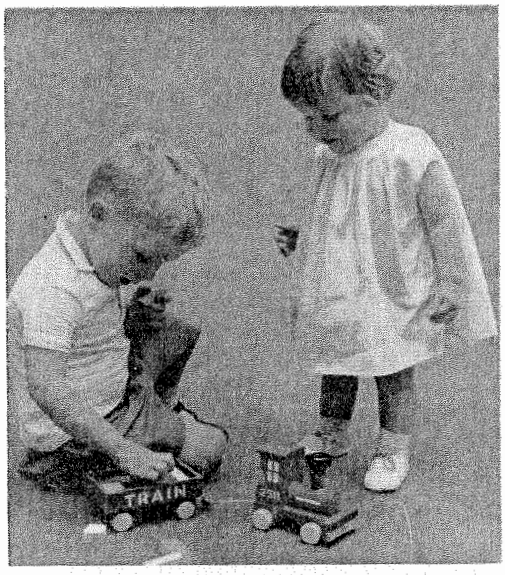
In the last few days before Christmas, staff break-up parties were held by most Divisions. The **Division of Textile Physics** staged their Christmas Revue on 15th December and held a staff dinner on Christmas Eve.

The Revue lasted for about ninety minutes, and a high standard of performance was maintained. One item dealt with the life and times of Ned Kelly; the secret concealed by his helmet was revealed, and at the same time the excellent costumes and characterizations gave the audience a vivid glimpse of family life and strife in the days of the wild colonial boys.

A bright song and dance routine dealt with topical matters, occasionally with a suggestion of satire, and another act showed how cookery (or chemistry) can go awry even though the recipe is faithfully followed.

Other parties on Christmas Eve were held by the **Divisions of Food Preservation, Animal Physiology** and **Physics.**

Even at far-off **Parkes,** the radio astronomers interrupted their pursuit of the Venus probe "Mariner" to hold a buffet dinner on 15th December.



Top left: The Isoi family at the Forest Products children's party. Middle left: A Mexican scene from the Textile Physics Revue. Bottom left: Fiona O'Donnell on the trampoline at Protein Chemistry. Bottom centre: Preparing for the Building Research children's party. Bottom right: David and Ruth Addo-Ashong at the Forest Products party. Centre right: Father Christmas was popular at the Fisheries children's party. Top right: Fiona and Peter Corke at the Head Office children's party.

THE RAINMAKERS

The Film Unit has completed a new film entitled "The Rainmakers". It is in colour, with sound, and has a screening time of 25 minutes.

The film traces the story of rainmaking from 1946 up until the present day. Shortly after the first successful cloud seeding experiment in America in 1946, the Division of Radiophysics was able to induce the first artificial rain ever to hit the ground.

Early experiments in the laboratory are excellently portrayed. Ingenious photographic techniques show dry ice seeding water vapour in a cloud chamber. The sequence is followed by shots of the early aerial experiments in which sackfuls of dry ice were tipped into cumulus clouds from an R.A.A.F. Hudson.

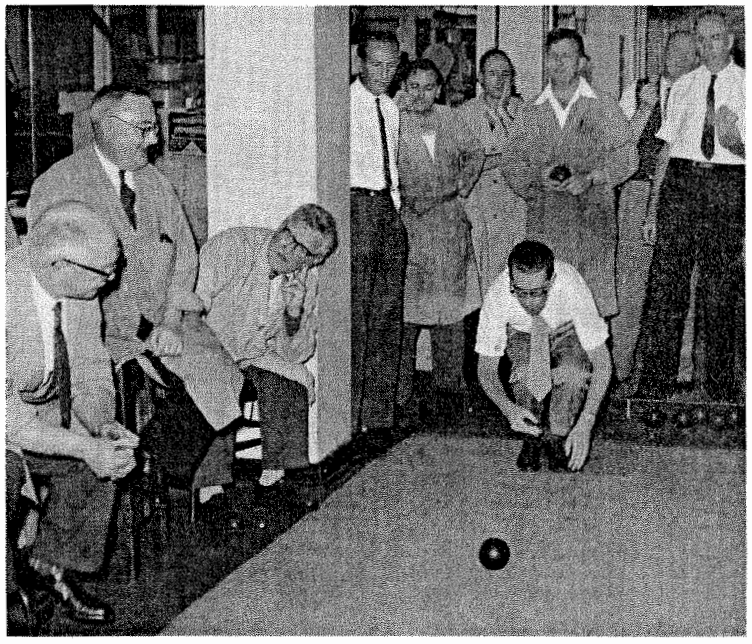
In further sequences the film shows how silver iodide smoke was tested in the laboratory, and how silver iodide burners were developed for use in aircraft.

All the operations in a modern cloud seeding experiment are shown. There are some beautiful shots of the Division's twin-engined Cessna aircraft engaged in cloud seeding.

From the air, the camera takes us to the ground where farmers and ski-borne Snowy Mountains workers read rain and snow gauges.

Back in the laboratory, Dr. E. G. Bowen, Chief of the Division, explains in simple terms the scope and design of the experiments.

The story of rainmaking is simply told, and the film is perfectly understandable to lay audiences. It has a strong feeling of authenticity, as it is largely compiled from record film taken over the years by Radiophysics photographer, Ken Nash.



Every day at lunch time enthusiastic members of the C.S.I.R.O. Indoor Bowls Club at the National Standards and Radiophysics Laboratories converge on the Division of Radiophysics workshop to try their skill. Matches are played on two coir mats, thirty feet long and six feet wide, using four-inch normal biassed bowls. The club has more than fifty active members and life membership costs one shilling. Regular singles, pairs, triples and fours competitions are played under local rules which approximate normal indoor bowls rules. About forty enter each competition — others often playing as replacements. There is a nominal playing fee which helps to make up the prize money. Our picture shows Tom Brock sending down a bowl in the grand final of a triples competition which took about two months to complete, and in which a team from the Radiophysics workshop beat an Administrative Office team.

Gliding Championship

Mr. D. G. Reid, of the Division of Meteorological Physics, will be one of the three pilots to represent Australia in the World Gliding Championships to be held in Argentina in February.

The contest will be held at Junin, a town on the grassy plains of the pampas, about 120 miles west of Buenos Aires. The competition will take the form of races around triangular courses or to destinations nominated by the task setters, based on the time taken to cover the distances.

Another form of daily task may be free distance, in which each competitor goes as far as he can, scoring additional points if he achieves a goal he nominated before take-off.

Teams from some twenty countries will compete, and a scientific congress on the design and construction of gliders and on the operational and meteorological aspects of gliding will be held concurrently.

Despite the difficulties of transportation, a new Australian glider will be entered, and it is likely to be well in the running for the prize for a standard class aircraft.

Mr. D. G. REID

APPOINTMENTS TO STAFF

Mr. K. D. Broadfoot has joined the staff of the Division of Textile Physics, where he will be in charge of an electronics laboratory. A graduate of Adelaide University, he has previously set up electronics laboratories at the Weapons Research Establishment, Salisbury, the Institute of Ophthalmology, London, and John Hopkins University, Baltimore, U.S.A.

Mr. B. J. Crack, a graduate of the Universities of Queensland and California, has joined the staff of the Division of Soils, and will be stationed in Townsville. He has been for the past fourteen years on the staff of the Queensland Department of Agriculture and Stock.

Mr. C. R. MacLellan has accepted a two-year fellowship in the biological control group of the Division of Entomology.

Mr. C. R. MacLELLAN

He is a graduate of McGill University and Queens University, Ontario. He is an entomologist on the staff of the Canadian Department of Agriculture's research station at Kentville, Nova Scotia.

Mr. W. G. Mumme has joined the Division of Mineral Chemistry as an X-ray mineralogist. A graduate of the University of Adelaide, he has just completed a thesis for a Ph.D. degree in palaeomagnetism.

Mr. R. E. O'Donnell, a graduate in engineering from the University of Sydney, has joined the staff of the Division of Textile Physics. He has served as an officer in the R.A.A.F., and as an engineer in Armstrong Siddeley and in Qantas.

Dr. J. K. Wilmshurst has been appointed to the staff of the Division of Chemical Physics. After graduating Ph.D. Auckland in 1956, he held a post-doctoral fellowship with the Canadian National Research Council. Since 1959 he has worked as a molecular spectroscopist at the Union Carbide Laboratories in Cleveland, U.S.A.

Dr. G. N. Lance, whose appointment as Officer-in-Charge of the Computer Research Section was announced in last month's "Coresearch".

Dr. W. G. WOODS

Dr. W. G. Woods has joined the staff of the Division of Organic Chemistry. He is a graduate of the University of California, and gained his Ph.D. degree at Caltech. Since 1958 he has been on the staff of the U.S. Borax Research Corporation.

Keeping a Tag on Tuna

The Division of Fisheries and Oceanography plans to put tags on 30,000 tuna and 100,000 salmon during the next two years.

Anyone finding a tagged fish should measure it from its snout to the fork of its tail and send the measurement, together with the tag, to the Division's Laboratory at Cronulla, N.S.W.

One of the present mysteries of Australian salmon is whether they spend most of their life at sea and only occasionally visit the coast or vice versa.

If they spend most of their life out to sea, we may be fishing only the fringe of the population, and discovery of the seaward distribution could lead to a big expansion of the fishery.

Intensive tagging, particularly of young salmon, may give some of the clues needed to answer this question of seaward distribution.

You won't know if you've caught a tagged salmon until you clean it — the tags are inside.

The tuna tags are pieces of red plastic rod, about as thick as spaghetti, and five inches long. They are attached to the fish near the dorsal fin, in the middle of his back.

Tagging tuna is no easy task. The fish are caught by trolling, hauled aboard, measured, tagged, and returned to the sea.

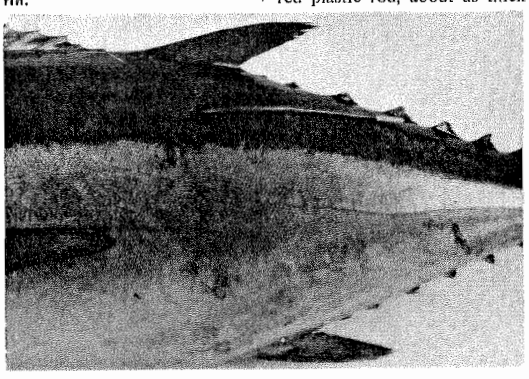
This may sound simple if you are thinking of a fish a foot or so in length and weighing two or three pounds, but the southern bluefin marked on the New South Wales coast average 30 inches in length and 20 lb. in weight. They are powerful and active, and struggle on the measuring board and when the tag is inserted.

Fishermen catching a red-and-yellow tagged tuna should hand it to an officer of C.S.I.R.O., a cannery official, or a fisheries inspector, and it will be paid for at ruling prices.

A few of the tags have yellow tips. These mean that the tagged fish have been injected with a yellow dye called terramycin.

This dye is absorbed into the bones, and an autopsy on the fish will show how much it has grown since tagging.

Tuna showing red and yellow tag inserted just below dorsal fin.



Printed by C.S.I.R.O., Melbourne

047##1963

CORESEARCH

FOR CIRCULATION AMONG MEMBERS OF C.S.I.R.O. STAFF — NUMBER 47, MELBOURNE, FEBRUARY 1963

UNITED NATIONS CONFERENCE

Several members of C.S.I.R.O. are included in an eighteen man Australian delegation to a major United Nations Conference on the Application of Science and Technology for the Benefit of Less Developed Areas (UNCSAT) which will be held in Geneva from 4th to 20th February.

The delegation will be lead by Lord Casey, a part-time member of the Executive and former Minister-in-Charge of C.S.I.R.O.

The Minister for External Affairs, Sir Garfield Barwick, said that the Conference was being held largely as a result of the initiative taken by Lord Casey at the United Nations General Assembly in 1958 when, as Minister for External Affairs and Leader of the Australian Delegation, he had proposed that the time had come for a world-wide survey to be made of the main trends of inquiry in the field of natural sciences.

Sir Garfield said that, as a result of this Australian initiative, and as a tribute to Lord Casey's part in it, Lord Casey had been invited by the Convenors to accept a Vice-Presidency of UNCSAT and to deliver a special address.

The other C.S.I.R.O. members of the Delegation are Mr. C. S. Christian, Member of the Executive; Dr. J. G. Davies, Chief of the Division of Tropical Pastures; Mr. C. S. Elliot, Assistant Chief of the Division of Forest Products; Mr. G. B. Gresford, ~~Secretary~~ of C.S.I.R.O.; and Mr. F. G. Nicholls, Officer-in-Charge of International Co-operation.

Another member of the Delegation, Professor C. M. Donald, is a member of the C.S.I.R.O. Advisory Council.

The purpose of the Conference is to consider how developing countries can benefit from recent advances in science and technology in their search for improved standards of living; how the application of these advances can affect the pattern of economic and social life of these countries; how scientific research can best be adapted to their special needs; and how scientific and technological development in the less developed areas themselves can be promoted.

The Conference will not be concerned with academic dissertations but will concentrate on bringing the full resources of modern science and technology to bear upon the developmental problems of less developed countries.

In these respects the purpose of this Conference is the same as that underlying all Australian aid programmes.

All member states of the United Nations and Specialized Agencies have been invited; about 2,000 scientific papers will be presented, and the total number of delegates attending will be between 1,500 and 2,000.

The specialist papers cover a wide variety of topics including natural resources, agriculture, transport, communications, industrial development, economic planning, training of scientific and technical personnel, and international co-operation.

The ninety-six Australian Papers accepted for the Conference were edited and prepared for publication by C.S.I.R.O.

Sir Garfield Barwick said that, although the Australian Delegation was small compared with delegations from such countries as the United States, U.S.S.R. and Britain, it was of very high quality and was composed essentially of leading scientists who were directly engaged in the practical application of science to Australia's development problems.

Australia is the fourth largest contributor of scientific papers and has had a greater proportion of its contributions accepted for presentation than any other country.

Three Australian papers — Survey and Assessment of Land Resources, by Mr. C. S. Christian; Science as a Major Factor in Development: The Special Problems Facing Science in Less Developed Countries, by Mr. F. G. Nicholls; and The Development of the National Telecommunication System, by Mr. R. W. Turnbull and others—have been singled out for oral presentation by their authors.

Australian delegates have been accepted as chairmen of two specialized sessions and as discussion leaders in at least eleven specialized sessions.

Sir Garfield said that the Australian Delegation was well qualified to make a substantial contribution to the success of UNCSAT.

He said: *"Australia is widely esteemed as a scientifically advanced country. Our unique situation as a not yet completely developed country, with a great variety of natural resources and climatic conditions, enables us to approach the problems of less developed countries with understanding based on our own experiences; our special experiences in Papua and New Guinea of the problems of applying science and technology to less developed areas is particularly relevant.*

"Under various international agreements, and particularly under the Colombo Plan, Australia has extended considerable technical assistance to South East Asia. Australian experts have built up a reputation for down-to-earth treatment of the problems of the area.

"Effective participation in the Conference will help to reinforce this reputation and may well increase the extent to which less developed countries look to us for scientific and technological advice."

Ski Club Builds

As a result of the enthusiasm and energy of its members, the C.S.I.R. Ski Club should have a second lodge at Falls Creek (Victoria) for the start of the next skiing season.

In the months before last Christmas, work parties in Melbourne completed fabrication of the ply-wood panel wall assembly and on the 21st December a semi-trailer loaded with eight tons of building materials set out for Falls Creek.

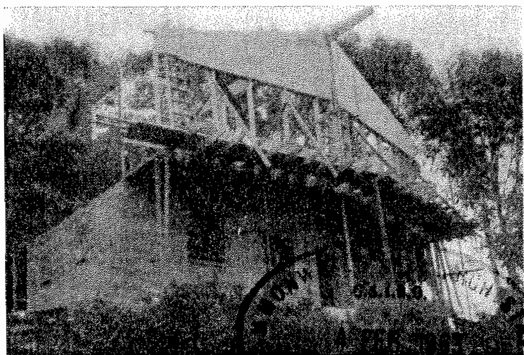
Working at different times, a group of almost forty Club members then began to erect the walls and part of the roof on the Besser block basement which was completed before last season's snow.

Windows were fitted in the closing days of the holiday period thus bringing the building to a lock-up stage.

The speed and ease of assembling the panel construction enabled the lodge to appear in a matter of days in spite of difficult weather conditions.

Further parties will work on the lodge over the next few months and it is hoped to have it fully operational in time for the coming season.

Anyone who would like to help in the construction of the lodge or to join the Club should contact Mr. E. S. Pilkington, Honorary Secretary, C.S.I.R. Ski Club, c/- Chemical Research Laboratories, Box 4331, G.P.O., Melbourne, without delay.

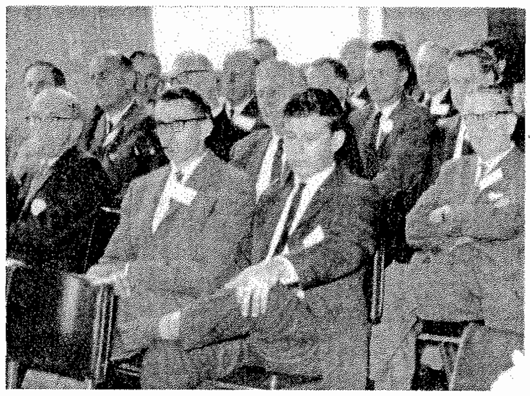


ERRATUM

In the article on "Salary Rises in E.O. Ranges" in "Coresearch", No. 46, it was stated that Class 4 will continue to be the maximum of the normal career range for Experimental Officers.

This should read, "Class 3 will continue to be the maximum . . ."

Food Industry Meeting



More than forty executives of food industry firms attended the Science and Industry Day held at the Division of Food Preservation's laboratories at North Ryde last November.

After welcoming the visitors, the Chief of the Division, Dr. J. R. Vickery, gave a short account of the Division's current research activities on processed fruit and vegetables, corrosion of tinplate, control of micro-organisms, fresh fruit storage and transport, and food flavour. Dr. W. J. Scott, Assistant Chief of the Division, then reviewed the work of the various research groups at Brisbane, Hobart and Gosford, as well as of the others at Sydney.

In the afternoon, the visitors toured the laboratories and discussed specific problems with individual research workers.

The day concluded with a meeting presided over by Dr. Vickery, who opened the discussion by inviting comment on the research needs of the Australian food industry.

He asked whether the present research effort, in which C.S.I.R.O. figured prominently, could be regarded as adequate, and whether it was likely to keep pace with developments in other countries. He said that the expenditure on food research in Australia represented only 0.1 per cent. of the sales value of foods.

Dr. S. H. Bastow asked if it was thought that additional research activity could be encouraged by more liberal taxation rebates. He quoted the Japanese practice of granting double taxation rebates on the amount spent on research.

A number of speakers favoured this idea and thought that it might prove an effective way of expanding research.

Several speakers considered that the Division's current research activities were well chosen in relation to the needs of the food industry.

The meeting ended with a discussion on the best ways of communicating research results to industry. Dr. Vickery said that this task was made much easier when firms possessed well qualified technical staff.

Our picture above shows delegates at the opening of the Food Industry Meeting.

NUFFIELD FELLOWSHIP

Dr. A. B. Hope, of the Plant Physiology Unit of the Division of Food Preservation, has been awarded a Nuffield Dominion Travelling Fellowship for 1963. Dr. Hope will work in the Biophysics Department of the University of Edinburgh with Dr. J. Dainty, and will study ionic movements in plant cells and across plant cell membranes.

APPOINTMENTS VACANT

The following vacancies for professional appointments are current:—

CHEMIST (E.O. I/II) — Division of Food Preservation, 300/357 (February 15).

DIVISIONAL ENGINEER (Engineer II/III) — Division of Food Preservation, 300/356 (February 15).

ENGINEER (Engineer I/II) — Division of Textile Physics, 465/167 (February 15).

EXPERIMENTAL OFFICERS (E.O. I/II) — Engineering Section, 430/206 (February 15).

EXPERIMENTAL OFFICER — CHEMIST (E.O. I/II) — Division of Food Preservation, 307/9 (February 15).

EXPERIMENTAL OFFICER (E.O. I/II) — Division of Meteorological Physics, 420/189 (February 15).

EXPERIMENTAL OFFICER (E.O. I/II) — Division of Plant Industry, 132/119 (February 15).

PLANT INTRODUCTION OFFICER (E.O. II/III) — Division of Plant Industry, 130/563 (February 15).

RESEARCH OFFICER (R.O./S.R.O.) — Division of Wildlife Research, 560/133 (March 15).

SCIENTIFIC ASSISTANT TO CHIEF (S.S.O. II/III) — Division of Dairy Research, 410/120 (February 15).

SOIL PHYSICIST (E.O. I/II) — Division of Soils, 270/255 (February 15).

CHEMICAL ENGINEER (E.O. I/II) — Division of Chemical Engineering, 608/31 (February 22).

EXPERIMENTAL OFFICER IN GENETICS (E.O. I/II) — Division of Plant Industry, 130/584 (February 22).

MICROBIOLOGIST (E.O. I/II) — Division of Biochemistry and General Nutrition, 250/118 (February 22).

PHYSICAL CHEMIST (E.O. II/III) — Division of Coal Research, 480/426 (February 22).

RESEARCH OFFICERS (R.O.) — Engineering Section, 430/202 (February 22).

SOIL SCIENTIST (R.O./S.R.O.) — Division of Land Research and Regional Survey, 618/112 (February 22).

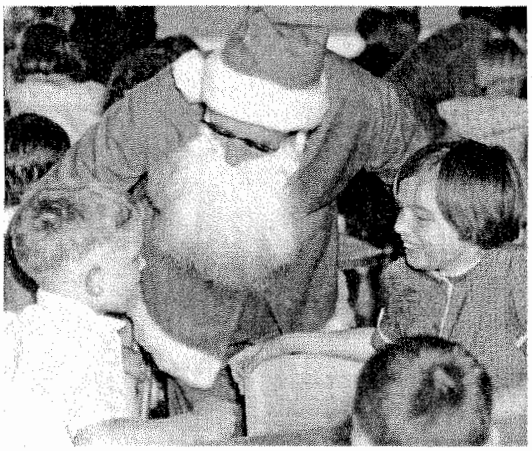
PHYSICIST (R.O./S.R.O.) — Division of Chemical Physics, 581/19 (March 8).

MERBEIN . . LIBRARY

~~C.I. 607(088.3) CO~~ S(COR)

Late Christmas Pictures

Barry Flint, farm overseer at Ginninderra, was kept busy at the Division of Plant Industry children's party providing tractor rides for young and old alike.



Father Christmas shares a joke with these youngsters at the Division of Textile Physics' children's party.

Graceful hula girls — Kerry Feldman, Jennifer Thorsby, Barbara Colledge and Lorraine Romanis — perform a scene from "South Pacific" for the staff of the Division of Textile Industry at their annual Christmas party.

CO-ORDINATING AGRICULTURAL RESEARCH

Any efforts by an overall agricultural research council to co-ordinate agricultural research throughout Australia could meet serious obstacles and have substantial drawbacks, agricultural scientists have been told in Brisbane.

Addressing the Queensland Branch of the Australian Institute of Agricultural Science late last year, Professor K. O. Campbell, Professor of Agricultural Economics at the University of Sydney, said that the volume of agricultural research output could be increased either by devoting more resources to research, or by making better use of existing facilities.

He said that improvements of the second kind could either be achieved within major research organizations or by improved co-operation and co-ordination between them.

"Co-ordination to some people means the epitome of scientific wisdom," Professor Campbell told the Institute. "To others it implies meddling and interference."

"Pleas for co-ordination and avoidance of duplication seem to imply that any research scientist can be put to work on a problem with perfect assurance that he will come up with an answer. This is patently not true. Research, particularly basic research, is a chancy business. In these circumstances it is wise to let several independent research scientists work on the same problem."

Professor Campbell pointed out that co-ordination of research restricted the freedom of the individual research worker to shift his efforts in the direction which to him seemed most promising, and this might significantly reduce his productivity.

Universities with their traditions of academic freedom and sovereign states with their jealous regard for states' rights were likely to resist threats to their independence stemming from bodies purporting to be co-ordinating research.

Evaluation of individual research projects—the traditional method of co-ordinating, and disbursing money for research —clearly prejudiced the quality of research undertaken, and threatened the rights of the individual scientist.

Assessing the practical difficulties facing any co-ordinating organization, he said that Australians had striven for co-ordination of scientific research for the best part of half a century without any conspicuous success. There was little reason for believing the chances of achieving this goal were more auspicious today than in the past.

Dr. E. M. Hutton, of the Division of Tropical Pastures, said that the development of the Agricultural Research Council to organize research in Great Britain had been a normal sort of evolution to fit the circumstances of a small closely knit country with fairly uniform agricultural conditions.

In the U.S.A., on the other hand, the State Universities played the major role, with the United States Department of Agriculture having a loose integrating influence.

"The size of the U.S.A. and the wide range of problems has led to agricultural research being done on a regional or ecological basis," said Dr. Hutton. "Australia is almost the same size as U.S.A. and has just as wide a range of conditions.

"With our strong Federal Parliament and the urgent need to tackle national problems facing the agricultural industries, C.S.I.R.O. was established as C.S.I.R. in 1926.

"Of more recent years Departments of Agriculture and University Departments of Agriculture and Veterinary Science have been playing an increasingly important part due to moneys allotted from funds provided by the various agricultural industries in conjunction with the Commonwealth Government.

"This loose and flexible system is proving to be well suited to agricultural research in Australia judged by the flow of worthwhile results coming forward."

Dr. Hutton said that no system was perfect and that any attempt to graft a so-called Agricultural Research Council on to our present quite satisfactory system could easily put the clock back.

"What suits Great Britain does not necessarily suit us here," he said. "We do not want to be diverted from our pattern of research development by catch cries such as 'let us co-ordinate our primary industry research with an agricultural research council'."

TECHNICAL ASSOCIATION NEWS

State of the Association, 1963

In the traditional State of the Union manner we assure our members that the Association is basically sound.

Membership and finances are steadily rising and we have a hard core of experienced and progressive officials. This is, however, by no means a time for complacency.

What has the Association achieved since its formation (as the Assistants Association) in 1946?

An effective organization to further the interests of the technical staff has been maintained and, a regular pattern of negotiation with the Executive of C.S.I.R.O. has been established.

Because of our small size, most of our gains have come from this direct negotiation with C.S.I.R.O.

Our successes have been mainly in the overhaul of anomalies, increased fringe benefits (e.g. Junior study fees), and the redress of individual grievances. On some major issues (e.g. salaries) we have been less successful.

How can we improve the Association?

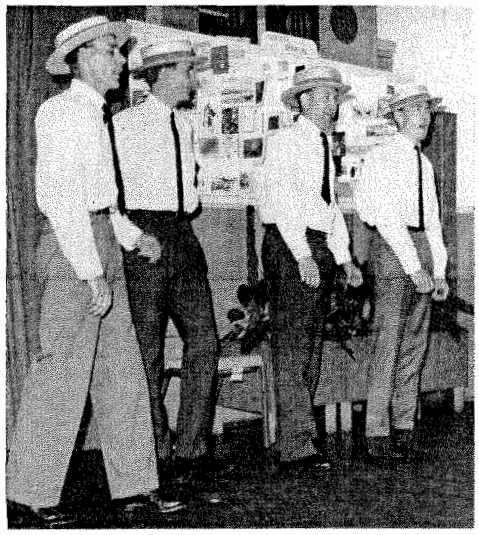
- Concentrate on our main objectives — better salaries and conditions. There is sometimes an undue emphasis on routine administration and minor complaints in the Association.
- Elect fighting and thinking men to key positions. Previous experience is always the most desirable qualification.
- Get all the facts and figures on the technical staff we represent and use them in carefully prepared cases to C.S.I.R.O.
- More money and more members are essential if we want to go places and do things. Our present membership level of a little over half is quite unacceptable.
- Another important improvement would be the use of the Association's "Gazette" as a discussion medium where new ideas could be debated and developed.

Visit from U.S. Weather Man

Mr. A. Bernstein, a Meteorologist with the United States Weather Bureau, Washington, joined the Division of Meteorological Physics last November.

He will work with members of the Division in studies of the structure of the boundary layer and problems of turbulent transfer.

Mr. Bernstein is accompanied by his wife and plans to remain with the Division for a period of approximately twelve months.



Coal Research Quartet

The following verses are culled from a larger work, which was sung with great feeling to the tune of Much Binding in the Marsh by the Coal Research Quartet at the Division's Christmas Revue. The Quartet comprises from left: Bruce Ayling, Michael Smyth, Ron Eckhold and John Corcoran.

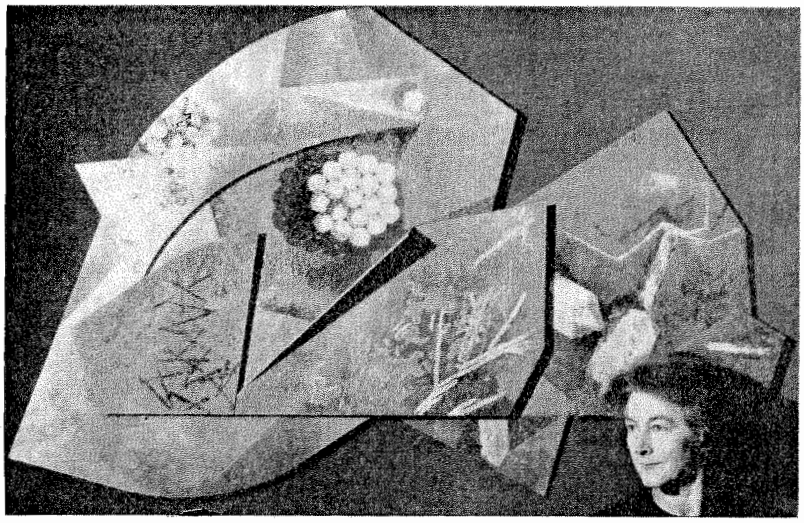
There's much going on at Coal,
The big wheels of research are always turning,
There's much going on at Coal,
From coal blending right through to brown coal burning.
In number 18 they're forever changing coal to coke,
They're shaving in the briquettes and converting them to smoke.
The way we're solving problems SEC will not go broke.
There's much going on at Coal.

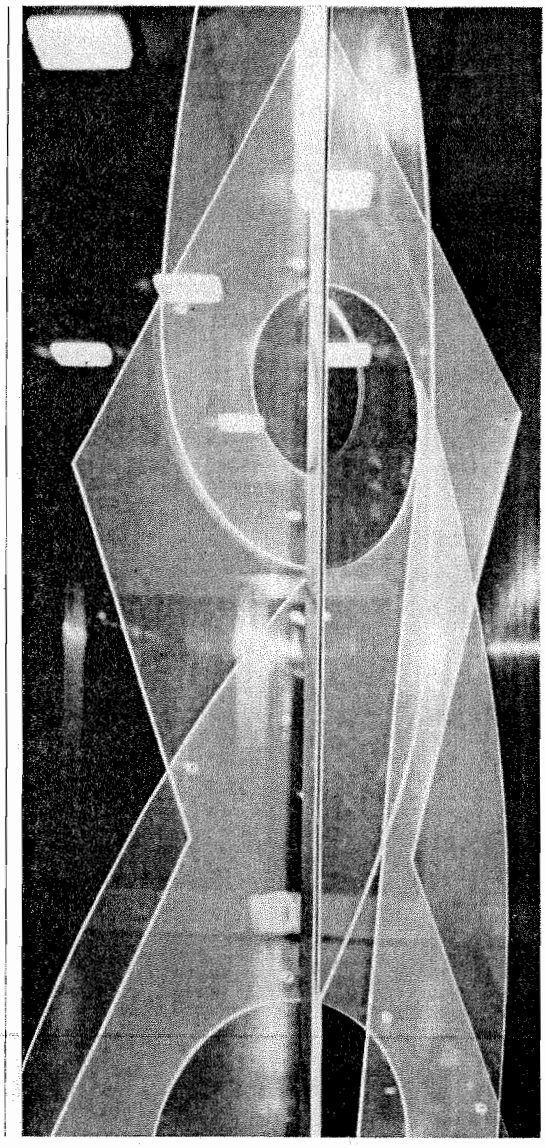
Now in building Number 3,
Our macroscopic section do their duty,
That's in building Number 3,
The electron microscope is quite a beauty
Geoff switches on, it warms up and then everything looks fine,
He slowly turns a dial to keep the current beam on line,
He looks into the screen and yells "I just got Channel 9!"
That's in building number 3.

At Coal Research up at Ryde,
There's something else that gives us satisfaction,
At Coal Research up at Ryde,
The fish tanks are a very gay attraction.
The workshop one's for people to see going in and out,
The Canteen's three, and here's a point of which there is no doubt,
They're lucky that on Fridays they are goldfish and not trout,
At Coal Research up at Ryde.

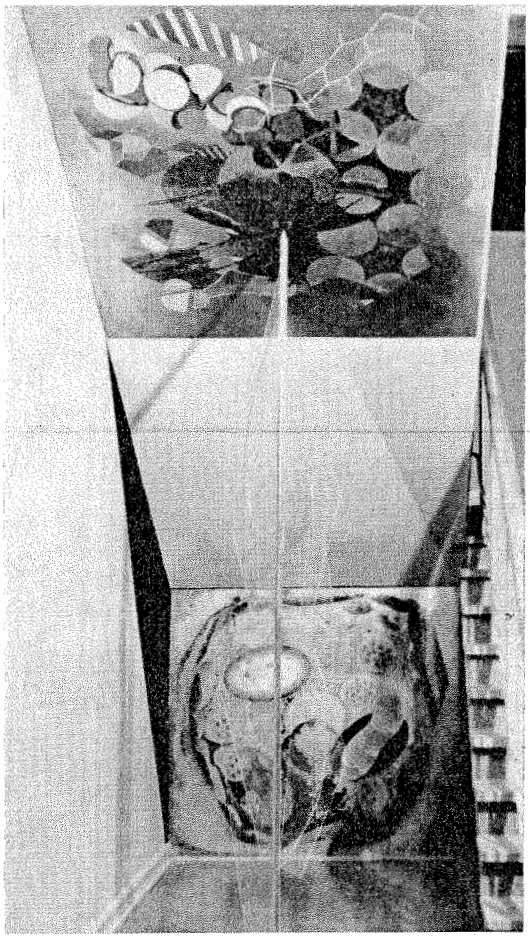
There's much going on at Coal,
We've gone and bought some new equipment lately.
There's much going on at Coal,
With our work they're going to help us greatly.
Work with the Mass Spectrometer we cannot interrupt,
So the NMR and ESR with data we fill up,
To help us find the winner of the next year's Melbourne Cup,
There's much going on at Coal.

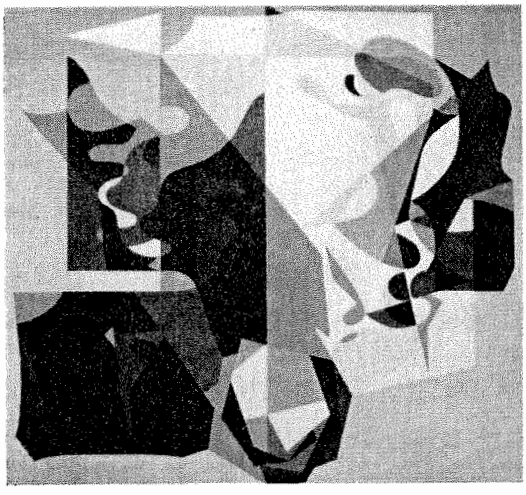
At Coal, up on Delhi Road,
Sometimes it is so difficult to find us.
At Coal up on Delhi Road,
With husband on one side and right behind us,
When someone says "Where do you work?", don't run away and hide,
With the cemetery and crematorium on either side,
You'll proudly say that you work in the dead centre of Ryde,
At Coal up on Delhi Road.





Striking Murals at Canberra





Well known Canberra artist, Nancy Parker, has produced three striking murals for the Genetics, Biochemistry and Microbiology buildings of the Division of Plant Industry in Canberra. They are all abstracts based on the common theme of science producing order out of chaos.

The Genetics mural (bottom left) is painted directly on to the wall but the other two are painted on aluminium sheets.

In the case of the Microbiology mural (above) the sheets have been cut into shapes held out from the wall to produce a bas-relief, while the Biochemistry mural (middle left) overcomes the problem of an extremely awkward site by employing two single plates fastened to the wall and to the tilted ceiling above it.

The lower panel employs cellular shapes and the one above it molecular shapes, while a perspex mobile in leaf forms (right) is used to emphasize the ceiling panel of scientific order.

INDIAN OCEAN EXPEDITION

The Indian Ocean, with an area of something like 28-million square miles, exercises a profound influence upon the lives of people living in adjacent countries, yet it is one of the least known bodies of water in the world.

Many of the countries lying in the tropical and sub-tropical regions surrounding the Indian Ocean are among the world's most densely populated — they contain more than a quarter of the world's people.

Some of these countries have a seafaring tradition and conduct extensive fisheries. They are interested, therefore, in learning more of the ocean's resources so that they can expand their fisheries and feed their crowded populations.

The Indian Ocean, however, is not to remain one of our unexplored frontiers for long. Following a suggestion by the Special Committee on Oceanic Research (S.C.O.R.) of the International Council of Science Unions, scientists of many countries have now joined together to investigate the Indian Ocean.

This co-operative project, the biggest so far attempted in the study of the sea, has come to be known as the International Indian Ocean Expedition and is sponsored by S.C.O.R. and U.N.E.S.C.O.

It is in every sense a combined operation, for work is shared and results made known to everyone. Planning goes back to 1957, but since then the United States, Soviet Union and Australia have all carried out reconnaissance cruises. In the last twelve months, Japanese and Australian parties have been at work in the eastern part of the Indian Ocean.

Along the east coast of the African continent, South African and French teams are carrying out investigations concerning the movements of fish, along that great ocean highway, the Agulhas Current, which, sweeping south past Madagascar, follows the coastline to the Cape of Good Hope.

Working further north, two ships of the Royal Navy have come back with the news that the East African continental shelf extends under water as far as the Seychelles, nearly 1,000 miles from the existing coastline.

In the same general area, ships belonging to France, Britain, the U.S.A. and Soviet Union, either singly or in company have carried out surveys that will have far-reaching results, which in the end will link up with work being done by scientists in both Pakistan and India.

Meteorological information collected from every source is passed to a bureau in Bombay, which is under the overall control of the United Nations Organization.

Shipping in use varies from vessels especially fitted out for the job, to commercial fishing trawlers. Naval survey ships like HMAS Gascoyne and Diamantina are floating laboratories in which research workers from C.S.I.R.O. are engaged in examining such things as water mass distribution, the supply of plankton, the organic life found in sea water upon which fish live, to all of which can be added the takings of soundings in order to map irregularities in the sea bed.

The International Indian Ocean Expedition is providing fundamental and valuable scientific knowledge, some of which has a direct and immediate bearing on economic development and human welfare.

It is encouraging collaboration among the many participating countries, and scientists from these countries are sharing each other's apparatus under working conditions.

From the viewpoint of international co-operation in science, it is showing how the facilities and organizational support of an inter-governmental body such as U.N.E.S.C.O. can be used to solve problems which arise because of the co-operative nature of some types of international science.

APPOINTMENTS TO STAFF

Mr. A. P. Andrews, a recent science graduate of the University of Sydney, has joined the Division of Wildlife Research where he will assist in research on the ecology of the wild rabbit in the arid zone.

Dr. R. H. Carr has been appointed to an eighteen months Post Doctoral Fellowship with the Division of Physics. Dr. Carr, who received his Ph.D. from Iowa State University recently, will investigate properties of metals at temperatures approaching absolute zero.

Dr. R. H. CARR

Mr. P. T. Bailey has been appointed to the staff of the Division of Wildlife Research. Mr. Bailey is a recent science graduate of the University of Sydney and will assist in research on the ecology of the kangaroo in the arid zone.

Mr. P. D. Berwick has been appointed to the staff of the Division of Meteorological Physics where he will assist with the technical administration of the Division. A graduate of University College, London, he has worked for the last ten years as a meteorologist in East Africa.

Dr. C. R. Faulkner has joined the staff of the Division of Applied Mineralogy. Since graduating Ph.D. from the University of Birmingham, he

Dr. C. R. FAULKNER

has carried out research for the U.K. Atomic Energy Authority and at the Weapons Research Establishment, Salisbury, South Australia.

Mr. H. T. KELLEHER

Mr. H. T. Kelleher, a science graduate from the University of Sydney, has joined the Division of Radiophysics. He will assist in the development of physical and chemical techniques and equipment used in the evaluation of cloud seeding experiments.

Mr. K. J. Hutchinson has been appointed to the staff of the Division of Animal Physiology and will lead a research programme at Armidale on the grazed plant/grazing animal complex. Mr. Hutchinson received his M.Sc.Agr. at Sydney University in 1955 and has worked with the Queensland Department of Agriculture and Stock and the Agricultural College Department of South Australia.

Mr. M. MORIMOTO

Mr. M. Morimoto has been appointed to the Division of Radiophysics where he will participate in the Division's research programme in solar, cosmic, and hydrogen-line radio astronomy. Mr. Morimoto completed his M.Sc. at the University of Tokyo in 1957, and for the last few years has been Research Assistant in Radio Astronomy at Tokyo Astronomical Observatory.

Mr. B. S. Parker, a recent science graduate of the University of Sydney, has joined the Division of Wildlife Research and will be engaged in an ecological study of the wild rabbit population in the Snowy Mountain high plains.

From the camera of Eric Smith, Division of Building Research.

Overseas Visits

Mr. G. D. Bowen, of the Division of Soils, left Adelaide recently for England where he will spend about twelve months at Oxford and the University of East Anglia studying micorrhiza nutrition of plants. He will return via Canada and the United States.

Mr. W. R. Ferguson, the Organization's Architect, is on a month's visit to Indonesia on a Colombo Plan assignment. He will advise the Indonesian Council of Sciences on the planning of new buildings and laboratories to be erected at Pararminggu near Djakarta.

Mr. K. J. Harrington, of the Wood Chemistry Section of the Division of Forest Products, will leave Australia this month for the U.S.A., where he will work for twelve months with the Research Department of the Oxford Paper Company, Rumford, Maine. During his stay with the company he will concentrate on research into the rheological properties of paper.

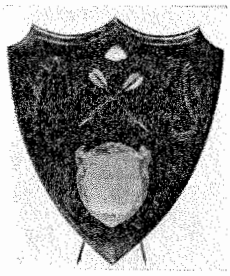
Dr. D. R. Lamond, of the Division of Animal Physiology, attended a meeting of the F.A.O. Expert Panel on Livestock Infertility in Rome last month. He will return via Great Britain and the United States where he will have discussions with research workers on the reproductive physiology of cattle with particular reference to the endocrinology of reproduction.

Mr. D. Michell, of the Division of Tribophysics, left Melbourne last month for England, Europe, and North America, where he will study X-ray microscopy and its application to the detection and observation of defects in metal crystals.

Mr. A. M. Stashevski, of the Division of Forest Products, left recently to spend nine months in Japan. He holds a Japanese Science Fellowship and will be working with the Government Experimental Stations at Meguro, Tokyo, and Asahigawa, Hokkaido, on problems related to plywood and particle board production. On the way to Japan he stopped in the Philippines and visited plywood factories and the Forest Products Research Institute.

DARTS TROPHY

A team of ten players from the Division of Fisheries and Oceanography recently won the concluding round of a tournament with the darts team from Cronulla R.S.L. Club, thus winning the Kevin Lawless Memorial Shield to hold for 1963.



This shield was made in the Division's Workshop and is played for in competition with Cronulla R.S.L. Club as a tribute to the memory of the late Kevin Lawless, who was a member of the staff of the Division and an active member of the Club.

There are six competition nights each year for men only, and a number of social darts nights where Divisional players and their wives can engage Club members in friendly combat.

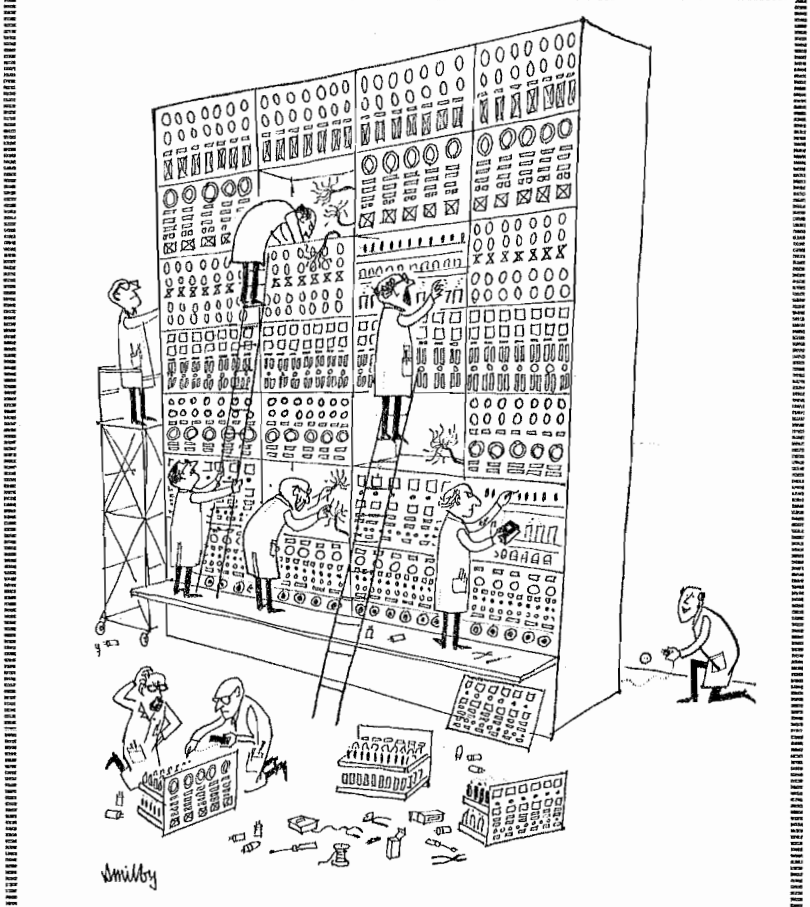
In brief

Honorary Consultant

Dr. H. E. Albiston retired recently from the position of Director of the Veterinary Research Institute at Parkville, Melbourne, and is now acting as Honorary Consultant in Veterinary Pathology to the Parkville laboratory of the Division of Animal Health.

O for the sound of a vanished voice . . .

Miss L. A. Thomas, who for twenty-six years manned the switch at the Division of Forest Products, left the Division last December to be married. Miss Thomas was presented with a jewel box and a travelling rug as mementoes of her long association with the Division.



"Hello — I think I'm on to something."

With grateful acknowledgement to "Punch".

Printed by C.S.I.R.O., Melbourne

048##1963

HORTICULTURAL RESEARCH SECTION C.S.I.R.O. MAR 1963 CANBERRA

CORESEARCH

FOR CIRCULATION AMONG MEMBERS OF C.S.I.R.O. STAFF — NUMBER 48, MELBOURNE, MARCH 1963

GRAZIER GIVES US A SHEEP STATION

A prominent New South Wales grazier, Mr. F. C. Pye, has decided to present an 8,500 acre pastoral property to C.S.I.R.O.

The property, which is called "Geraldra", is at Stockinbingal, near Cootamundra, in New South Wales. It can carry 10,000 Merino sheep as well as some cattle, and two thousand acres are sown down to wheat. On current market values, the property is worth approximately £250,000.

C.S.I.R.O. already has two experiment stations in southern New South Wales, and the property itself will not be used for agricultural research.

Mr. Pye has willingly given his consent for C.S.I.R.O. to sell the property, and to use the proceeds of the sale to set up an F. C. Pye Research Fund. The Executive of C.S.I.R.O., as trustees of the fund, will use the money to support research which is likely to benefit the pastoral industry.

Sir Frederick White, in expressing appreciation of Mr. Pye's decision to give "Geraldra" to help finance research, said that this was the largest private gift ever given to C.S.I.R.O.

"The gift reflects Mr. Pye's strong sense of public spirit and exemplifies his preparedness to help the pastoral industry in which he had been engaged all his life," said Sir Frederick.

Advisory Council

The Minister-in-Charge of C.S.I.R.O. has approved the appointment of one industrialist and two graziers to the Advisory Council of C.S.I.R.O.

The industrialist is **Mr. C. G. McGrath,** of Melbourne, the Chairman of Directors of Repco Ltd.

The graziers are **Mr. Colin Kelly,** B.Agr.Sc., of Caramut, Victoria, and **Mr. P. J. Young,** B.Ag.Sc., of Kybybolite, South Australia. Mr. Young went to England in 1960 as the Nuffield Farming Scholar.

Mr. C. M. Williams, of South Australia, and Professor H. C. Forster, of Melbourne, have retired from the Council.

APPOINTMENTS VACANT

The following vacancies for professional appointments are current:—

EXPERIMENTAL OFFICER (E.O. 1/2)—Division of Chemical Physics. 581/24 (March 8).
PHYSICIST (R.O./S.R.O.)—Division of Chemical Physics. 581/19 (March 8).
RESEARCH APPOINTMENTS IN RADIO ASTRONOMY (R.O.)—Division of Radiophysics. 780/314 (March 8).
EXPERIMENTAL OFFICER (E.O. 1/2)—Division of Plant Industry. 130/590 (March 15).
EXPERIMENTAL OFFICER (E.O. 1/2)—Division of Textile Industry. 464/298 (March 15).
RESEARCH OFFICER (R.O./S.R.O.)—Division of Wildlife Research. 560/133 (March 15).
CHEMICAL ENGINEER (R.O./S.R.O.)—Division of Coal Research. 480/430 (March 22).
EXPERIMENTAL OFFICER (E.O. 1/2)—Horticultural Research Section. 490/120 (April 12).
RESEARCH CHEMIST (S.R.O./P.R.O.)—Division of Mineral Chemistry. 601/11 (April 12).
RESEARCH OFFICER (R.O./S.R.O.)—Computing Research Section. 900/3 (May 31).

Doctorates

Mr. C. J. Brady, of the Fodder Conservation Section, has been awarded the Ph.D. degree of the University of Aberdeen. The work for his thesis, entitled "Chemistry of Nitrogenous Materials in Plant Leaves", was carried out at the Rowett Research Institute.

Dr. C. H. Gallagher, of the Division of Animal Health, has been awarded the degree of Doctor of Veterinary Science by the University of Sydney. His thesis was entitled "Studies on the Biochemical Basis of Pathology".

Dr. C. M. STEWART

Mr. C. M. Stewart, of the Division of Forest Products, has fulfilled the requirements for the degree of Doctor of Science in the University of Melbourne. His thesis was entitled "Studies on the Chemistry of Wood Substance, with particular reference to the species *Eucalyptus regnans* F. Muell".

Death of Dr. Stillwell

Dr. Frank L. Stillwell, one of Australia's foremost geologists, and a world authority on minerals, died on 8th February after a short illness. He was in his seventy-fifth year.

Dr. Stillwell graduated at the University of Melbourne in 1911, and after a short period of research, went south with Mawson, as a geologist on the Australasian Antarctic Expedition of 1911-1914.

He mapped a considerable section of the coastline of Adelie Land, and made an extensive collection of the rocks outcropping along this section of the Antarctic coast.

A petrological study of this rock collection, published in the Expedition's reports under the title "Metamorphic Rocks of Adelie Land", attracted world - wide interest, and brought him his doctorate.

In it Dr. Stillwell introduced the concept of "metamorphic differentiation", a process now recognized as fundamental in the formation of metamorphic rocks.

In 1916 he enlisted in the A.I.F., but after a short period of military service was seconded to scientific investigation.

He then became Secretary and Investigator on gold research to the Commonwealth Institute of Science and Industry, and made an extensive study of the occurrence of gold in the quartz reefs of Bendigo, in the course of which he made a second major contribution to geological thought by demonstrating the "replacement" origin of the quartz reefs.

In recognition of this outstanding work he was awarded the Syme Prize of the University of Melbourne, and was made a Research Fellow of that institution.

In the succeeding years he assisted the Mines Department of New South Wales in its study of the Broken Hill district. Dr. Stillwell contributed a petrological study of the great Broken Hill lode and the rocks in its immediate environment.

In 1922-23 he visited the mining fields of Europe, South Africa and the United States, where he gained an insight into mineragraphy — the study of polished surfaces of the opaque ore minerals with the reflecting microscope, a line of investigation then in its infancy.

On his return to Australia he applied the new techniques in a study of the mineral composition of the Broken Hill lode, which revealed at once the economic and scientific possibilities of mineragraphic studies.

In 1927 he was appointed as Research Petrologist to the Council for Scientific and Industrial Research to continue mineragraphic research. He later became Officer-in-Charge of the Mineragraphic Section.

His mineragraphic studies were interrupted to make a geological survey of the Kalgoorlie goldfield, then in a decline.

This survey, undertaken under the auspices of the comprehensive geological and petrological study of the field, brought into conjunction data previously kept separate in the private files of the individual mining companies, and contributed materially to the subsequent revival of the field.

It was followed up by a mineragraphic study, equally comprehensive, of the Kalgoorlie ores—yet another major contribution to geology, this time of the telluride minerals.

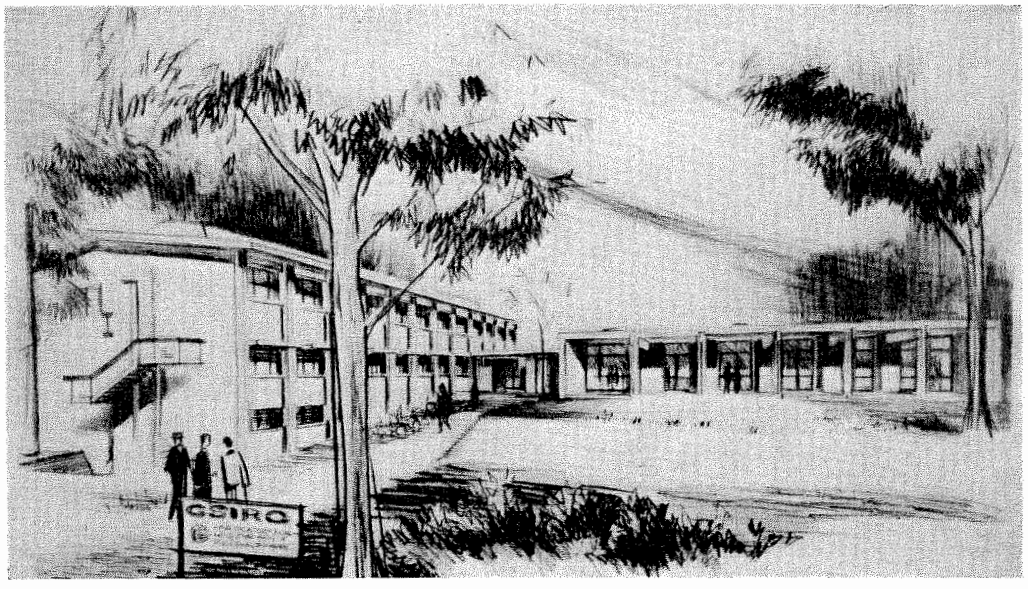
In the succeeding twenty-five years, until his retirement in 1953, Dr. Stillwell built the Mineragraphic Section into a unit which achieved world standing, and made a major contribution to the Australian mining industry, examining ores, mattes and slags, tracing the causes of losses in recovery in gold, copper, lead and tin ores, and checking the efficiency of milling methods. Almost every major ore deposit in Australia has received some share of its attention.

Dr. Stillwell, himself, published more than 50 scientific papers, and achieved a geological experience unique in Australia.

The Royal Society of Victoria, of which he was Secretary and Editor for many years, made him its President. The Royal Society of New South Wales, in 1951, awarded him its Clarke Memorial Medal, struck in memory of the first Australian geologist.

The Australasian Institute of Mining and Metallurgy, of which he was an active member, gave him in 1949 its highest honour — the Institute Medal. He was created a Corresponding Member of the Geological Society of America, the highest honour that body can bestow upon a foreign geologist.

Dr. Stillwell was awarded an O.B.E. for his services to the Australian mining industry, and in 1954 he was elected a Fellow of the Australian Academy of Science.



Above is an artist's impression of the new headquarters building which is to be built for the Division of Land Research and Regional Survey at Black Mountain, Canberra. A contract for £150,777 has been let to A.C.T. Builders Pty. Ltd. Work on the foundations has already started, and the building is expected to be completed by the end of this year.

Cf 607/1085-21 Co- S(COR)

Research on the Other Side of the South Pacific

Few Australians think much about their eastern neighbour, Chile, one of the few countries which have a common land border with an Australian Territory (at the South Pole!).

Chileans and Australians were good friends and trading partners in the days when windjammers rounded Cape Horn to go home to England.

Chile has not forged ahead as spectacularly as Australia in the last generation, though she does not lack resources, and though her eight million people do not mind hard work if they see a good reason for it. Today Chileans are trying to develop their country, and Chilean leaders are beginning to realize that science is basic to development.

Universities

Research in the sense of eliciting new facts is confined almost entirely to the seven universities. The total number of students is about 24,000

by W. G. Kauman

Dr. W. G. Kauman, of the Division of Forest Products, is at present on an F.A.O. assignment in Chile. He will be there until June, 1964, and would be very happy to answer enquiries and give personal assistance to any Australian scientist intending to visit Chile.

(1960), of whom some thirty per cent. are studying science and engineering and ten per cent. medicine and dentistry. Of the graduates produced in 1960, about a fifth were scientists (including some high school teachers) or engineers and another fifth in the medical and dental faculties.

The combined budgets of the universities are of the order of £A25 million, of which £4 to 5 million is earmarked for research.

By law, one half per cent. of direct taxation revenue is allotted to research; this amounts to about £1 million. The remainder is contributed by the national budget, international assistance programs, donations, and (to a small extent) projects sponsored by Chilean industries.

Some five or six hundred university people are classified as research officers in science or engineering, and another four hundred or so in medicine and dentistry. Some of these are part-time staff, and some hold administrative positions.

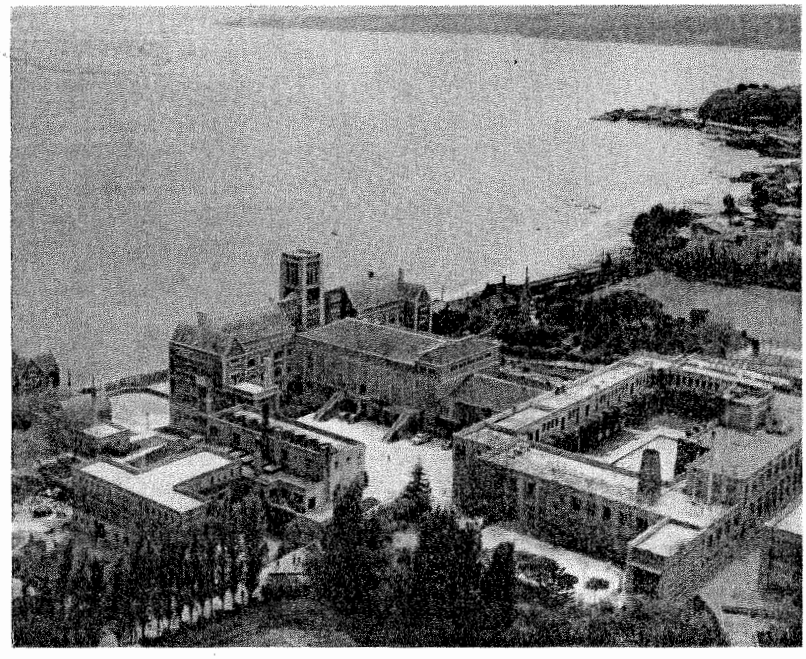
A recently formed "Council of Rectors" of all universities co-ordinates research projects and allocates the funds provided by direct taxation to those it considers of greatest importance.

Natural Resources

Chile's present situation might be compared to Australia's situation in the 1920's. The most urgent need is still the appraisal and utilization of the natural resources of the country.

Agricultural and biological sciences, particularly systematics and taxonomy, mineralogy and metallurgy, occupy important positions, whereas basic work in physics and chemistry is pursued by a few specialists.

One of the most important tasks of Chilean universities is the training of competent and versatile engineers. Engineering faculties are generally large and relatively well equipped, but research is mostly confined to the short-term solution of applied problems.



"La Chile"

The first official Chilean university (San Felipe) was founded in 1738, but was replaced in 1843 by the present "Universidad de Chile". "La Chile" now has over 12,000 students.

The large Faculty of Physical and Mathematical Sciences comprises the engineering schools and several institutes specializing in topics such as strength of materials, metallurgy, cosmic radiation, and seismology, which is of supreme importance in Chile.

Research in chemistry and pharmacology is concentrated on natural products and phytochemistry, but is also concerned with organo-metallic complexes, polarography, biochemical phosphates, and other topics.

The Faculty of Agronomy is working on plant and animal parasites, silviculture and forest products.

The Catholic University of Santiago, founded in 1888, now has some 3,500 students, and another 2,000 are in the Catholic University of Valparaiso. Research is mainly done in specialized Institutes of the Faculties of Science and Medicine.

Of interest are projects on the fine structure of spectra of high-temperature stars, on the relation between earthquakes and geomagnetic fluctuations, and on extractives of Chilean plants.

Research on physical properties of materials is mainly confined to undergraduate theses and concerns structural engineering, acoustics, thermal conductivity, and so on. In the Faculty of Agronomy, a large survey of soils on a national scale is in progress.

Lottery Financed

In spite of its recent foundation (1923) and the damage done by two major earthquakes, the University of Concepción (2,000 students) is an active research centre. It has the distinction of being financed by a lottery.

Because of its location in an industrial zone with blast furnaces, steel works and paper factories nearby, chemistry occupies an important position in its research programme.

Work is being done on metallurgy, mineralogy, solutions, reaction kinetics, vegetable proteins in relation to plant growth, and applied wood chemistry.

The pharmacologists are looking into plant alkaloids and bromatology, whereas the Medical School has been investigating endotoxic aspects of the shock syndrome. The Faculty of Agronomy, located in Chillán, undertakes research on animal health, plant introduction and the nitrogen balance in soils.

Small Universities

The "Universidad Austral" in Valdivia was created in 1954 to train agricultural and forest engineers and veterinary surgeons. In spite of severe damage in the 1960 earthquakes, it has now about 400 students, and some research has already got under way on the pathology of domestic birds and cattle, on insect parasites of araucaria trees, on natural regeneration of indigenous forests, and on forest products.

The Technical University Federico Santa Maria in Valparaiso is named after its founder, who endowed it in 1931. Intensive study is carried out in small classes, and the student body is only 400.

The University has well-equipped laboratories and is doing interesting work on electron microscopy of the structure of clays, isotherms of salt solutions, properties of various extractives of Chilean plants, and utilization of solar energy.

Its recently inaugurated Graduate School provides advanced courses leading to the degree of "Doctor of Engineering".

One of Chile's smaller universities—the Technical University Federico Santa Maria, Valparaiso. The student body numbers only 400.

The Vice-Rector, Professor J. Hirschmann, who is in charge of solar energy work, recently visited Australia as a Vice-President of the World Power Conference.

Last but not least, the "Universidad Técnica del Estado", founded in 1947 (2,500 students), incorporates the older School of Industrial Engineers in Santiago and a number of technical schools and colleges in the provinces.

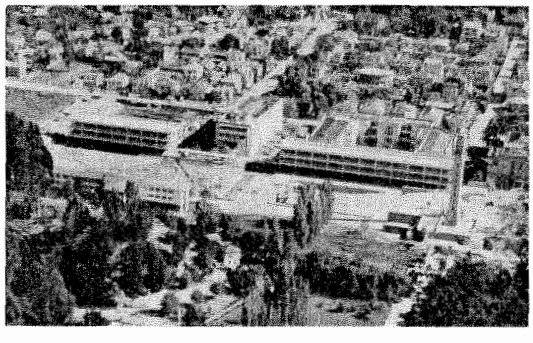
Up to the present, its research has been limited to the solution of engineering problems, but its educational work at the tradesmen and technicians levels is of inestimable value to Chile.

Similarities

From the Australian scientists' point of view, Chile's geographic position in the same southern latitudes, her paleontological connections with Australia and New Zealand and her ecological panorama, with its many similarities to our part of the world, make it an interesting country.

The geologist, botanist, forester, entomologist, marine biologist, agronomist and workers in related sciences would find a visit interesting and worthwhile. If they were able to arrange a longer stay, they would be cordially welcomed by their Chilean colleagues, who practically all speak English.

The University of Concepción has the unusual distinction of being financed by a lottery.



TECHNICAL ASSOCIATION NEWS

Past Presidents and Future Proposals

The first 1963 meeting of Central Council, on 25th January, had several important matters on the agenda. The role of a Past President was clarified by an amendment to the Constitution and plans for action on several questions were resolved.

One of these concerned a work-value survey and an approach to the Executive on restoring the former salary relationship between Technical Officers and Experimental Officers.

Mr. W. J. Menzies, New South Wales Chairman, had made a special trip to present some New South Wales proposals to the meeting. Mr. E. A. Lawton, of Mildura, also attended as an observer.

Paragraph 13(ii) of the Constitution was amended to read as follows:—"The Past President shall be the retiring President and shall hold office for the year following that in which he held office as President, unless he ceases to be a member of the Association during that period. In the event of the office of Past President becoming vacant, it shall not be filled during the year in which it falls vacant."

As the Past President is not an elected officer he will not have a vote in Council decisions.

Two alternative plans were proposed for conducting a survey on the work-value of Technical Staff. Discussion on these plans could fairly be described as vigorous, but honest differences of opinion are usually a healthy sign and eventually a satisfactory compromise was reached.

The survey will be conducted by a sub-committee located in New South Wales. Two well-known members of this committee are Messrs. Eric Murray and Bill Menzies.

A questionnaire on work-value will shortly be given to every member and the committee would appreciate the early return of completed forms.

We plan to present those eligible for membership with a membership form and a questionnaire. This tangible evidence that the Association is "in there trying" may well prompt some of our "passengers" to sign on the dotted line. We hope they will.

Permission for the survey has been given by the C.S.I.R.O. Executive, and Divisional Chiefs and Officers-in-Charge have been notified accordingly.

OBITUARY NOTICES

MR. A. T. DANN

With the death of Arthur Thurlby Dann, on 15th December, 1962, the Organization lost a research officer who had served it well for over thirty-three years.

Arthur Dann was born at Castlemaine, Victoria, in 1905. He was educated at the Castlemaine High School, of which he was dux in 1921, and went on to Melbourne University on a Senior Government scholarship to take a science degree.

He completed his B.Sc. in 1926 and graduated M.Sc. in 1928, winning the Wyselaskie Scholarship in Natural Science and the Dixson Research Scholarship in Chemistry.

He stayed on in the Chemistry Department working with Dr W. Davies on organic compounds of fluorine, until he accepted an appointment with C.S.I.R. in 1929.

After a short period in the Biochemistry Department with Professor W. J. Young, he joined Dr. L. B. Bull (then Director of the S.A. Government Laboratory of Pathology and Bacteriology) in Adelaide, to work with him and the late C. G. Dickinson on *haematuria vesicalis* of cattle.

As the Council's work on stock diseases expanded and was organized within a Division of Animal Health, with the late Dr. J. A. Gilruth as Chief, a laboratory was established at Oonoonba to tackle problems of the Queensland cattle industry.

The need for a chemist with a wide range of capabilities in the Oonoonba team was soon felt and Dann was transferred to Townsville in 1933 to work with Dr. A. W. Turner and Dr. R. B. Kelley on the disease, "Peg-Leg" of cattle.

Once the programme was set up, however, the chemical work became largely routine and could be carried on by others and Dann went to England in 1935 to familiarize himself with the developing field of immuno-chemistry. He spent the next two years working in this field at the Lister Institute with W. T. J. Morgan.

During this period he took the Pregl course in microchemistry at Graz and on his return to Australia in 1937 he was located at the newly-established Animal Health Research Laboratory at Parkville, where he continued to work until his death.

After some years investigating the antigenic structure of specific micro-organisms, he reverted to his original problem, haematuria, examining the complex mixture of organic substances in cattle urine.

Mr. A. T. DANN

More recently he linked up with the team interested in the biological activities of pyrrolizidine alkaloids. In this field, he contributed to the elucidation of the mechanism by which these alkaloids produce chronic liver disease and to the recognition of the probable role of cobalt in protecting the grazing ruminant from hepatosis.

The full value of Arthur Dann's contribution to the work of the Division cannot be properly appreciated, however, without taking into account the very real assistance that he was able, and always willing, to give from his wide knowledge of chemistry and his ability as a mathematician, in the work of the many colleagues who consulted him on these aspects of their problems.

He was of a retiring disposition and in every sense a gentleman. His attitude was always one of kindly helpfulness to others and self-effacement. He remained a bachelor, but his kindly nature endeared him to the children of his friends, relatives and colleagues. Christmas was always a busy time for him.

He was a very capable photographer, a keen hiker and had a very real appreciation of music. It was characteristic of him that he always took two season tickets for the A.B.C. concerts so that he could invite others to share his enjoyment.

Arthur Dann will be as sadly missed by his wide circle of personal friends as he will be by his scientific colleagues.
—A.T.D.

DR. L. BAAS BECKING

Lourens Baas Becking was born on 4th January, 1895, in Deventer, Holland, and died in Canberra on 7th January, 1963. He was a distinguished biologist whose encyclopedic knowledge and brilliant intellect allowed him to cover adequately a very wide range of subjects and enrich them with his ideas.

He took his Ph.D. at Stanford in 1921 and his D.Sc. at Utrecht (cum laude) in the same year. At Stanford he became Professor of Economic Botany and Herzstein Professor of General Physiology and returned to Holland as Professor of General Botany at Leyden.

In 1939 he became Director of the Botanic Gardens at Buitenzorg, Java. During the European war he was active in the Dutch underground movement, his exploits winning for him the Netherlands Military Medal and a Knighthood of the Netherlands Lion.

From 1949 to 1950, Professor Baas Becking was Deputy Chairman and Director of Research for the South Pacific Commission, and in 1951 he became Emeritus Professor of Botany at the University of Sydney.

He later joined the Division of Fisheries of C.S.I.R.O. and worked on the microbial chemistry of the estuarine environment, to which he made a valuable contribution. He continued this work at the Bureau of Mineral Resources where the emphasis was on the microbial deposition of minerals.

At the time of his death, he was writing a book on Geobiology which covered a vast field and expounded many of his brilliant and often startling ideas. He strongly advocated the synoptic view of biology and deprecated the narrow view and limited field of study which so often characterises modern research.

He believed that nature is a continuum and must be studied as such. "Everything is everywhere, and requires the right environmental conditions to make its presence felt" was his dictum.

It was a privilege to have known Baas Becking, and his associates found him ever stimulating.—E.J.F.W.

Two Visitors

Dr. Arthur Elliott, a distinguished British spectroscopist who has specialized in studies of the infra-red spectra of polypeptides and proteins for many years, is visiting the Wool Research Laboratories for a period of four months.

During his stay he will give the Fourth Series of Parkville Protein Lectures in Melbourne towards the end of March.

Dr. Elliott, who is accompanied by his wife, will be based in Melbourne but will visit and lecture in other centres.

Mr. G. E. SHERBINI

Early in February, **Mr. G. E. Sherbini,** of Egypt, arrived at the Division of Forest Products under an Australian International Award Scheme fellowship.

Mr. Sherbini will study all aspects of wood technology and will be in Australia for about two years. He is a graduate of the University of Cairo and an officer of the Ministry of Agriculture in Egypt.

New Year Honours

Mr. E. Angus Jones, Vice-Chairman of the Campaign Committee of the Ian Clunies Ross Memorial Foundation, was created C.M.G.

Mr. E. H. Lee Steere, Chairman of the Western Australian State Committee, was awarded the C.B.E. for his services to the pastoral industry.

Mr. Maurice Mawby, a member of C.S.I.R.O.'s Victorian State Committee and a former member of the Advisory Council, was knighted in the New Year Honours. Sir Maurice is Chairman of Conzinc Rio Tinto of Australia Ltd.

Overseas Visits

Mr. J. Lipsett, of the Division of Plant Industry, left recently for the United Kingdom. He will spend eight months with Professor Hallsworth in the School of Agriculture, University of Nottingham.

Messrs. W. J. Lovett and D. C. Wark, of the Division of Plant Industry, left last month for Rhodesia, where they are attending the Third World Scientific Tobacco Congress at Salisbury. Mr. Lovett will return to Australia via the United States and Japan.

Dr. D. W. Posener, of the Division of Applied Physics, is visiting various research institues in Europe and the United States. He has just attended the Third International Symposium on Quantum Electronics in Paris.

Dr. T. R. Scott, of the Division of Mineral Chemistry, left last week for America, where he will attend a symposium of the American Institute of Mining, Metallurgical, and Petroleum Engineers at Dallas, Texas. He will then visit Argentina, where his patented process for alumina extraction may find application.

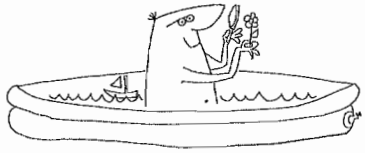
"The Experts"

The Melbourne "Herald" had a story about Dr. Roman Bisque, a chemistry professor at the Colorado School of Mines, who is fed up with the super-specialisation of scientists.

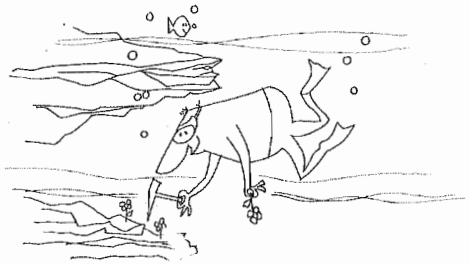
He says it has almost made reality of Aristophanes's whimsy about the nose specialist who could not treat a patient with an infection of the left nostril because his field was the right nostril.

Dr. Bisque has composed his own list of definitions of specialists:

Hydromicrobiogeochemist: One who studies small underwater flora and their relationship to underlying rock strata by using chemical methods.



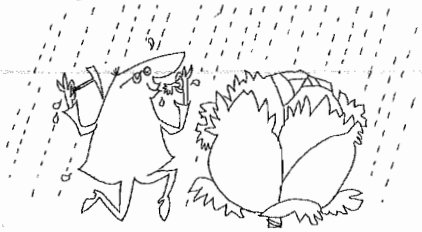
Microhydrobiogeochemist: One who studies flora in small bodies of water and their relationship to underlying rock strata by using chemical methods.



Microbiohydrogeochemist: One who studies small flora and their relation to underlying rock strata by using chemical methods and skindiving equipment.

Biohydromicrogeochemist: A very small geochemist who studies the effect of plant life on hydrology.

Hydrobiomicrogeochemist: A very small geochemist who studies wet plants.



Biomicrohydrogeochemist: A very small, wet geochemist who likes lettuce.

Dr. C. S. Piper Retires

Dr. C. S. Piper retired recently after an association of thirty-eight years with the Waite Agricultural Research Institute and the C.S.I.R.O. Division of Soils.

In the years before he became part-time senior chemist for the Division of Soils in 1944, Dr. Piper worked with Professor J. A. Prescott on the Mallee Soils and the Red Brown Earths. He became an authority on trace elements in soils and plants, working first on manganese, and then on boron, copper, zinc and molybdenum.

In 1942 he published "Soil and Plant Analysis" which was reprinted a number of times in Australia and the United States and translated into Polish. It has been widely accepted as a standard text.

He became full-time leader of the Soil Chemistry Section of the Division of Soils in 1956 and turned his attention to the availability of phosphorus and potassium in soils.

Through his own work and by his leadership, backed by a long experience in the tackling of soil problems, Dr. Piper has made an outstanding contribution to the development of soil chemistry in Australia.

By nature unassuming and retiring, he was quick to bring to full fruition the personal qualities which were latent within those who came to work under him.

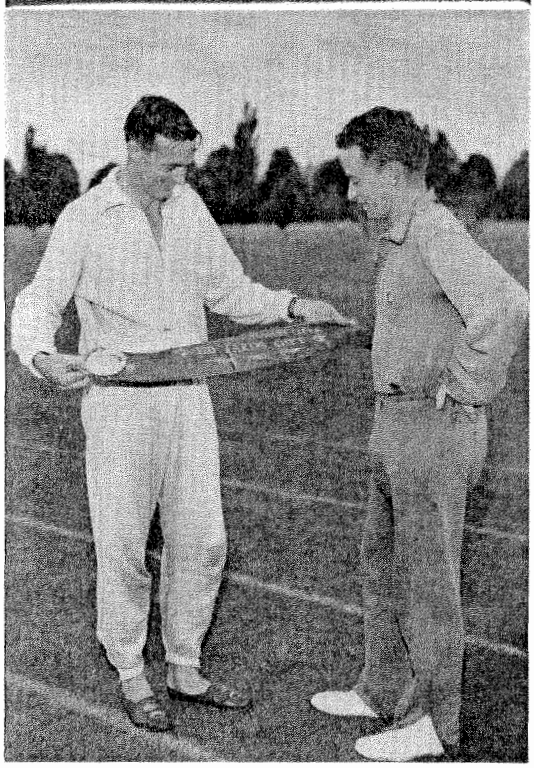
Among the many honours bestowed on him were the Verco Medal of the Royal Society of South Australia, a doctorate of science from the University of Adelaide, and the H. G. Smith Memorial Medal of the Royal Australian Chemical Institute.

Dr. C. S. PIPER

He has been President of the Royal Australian Chemical Institute (South Aust. Branch) and also of the Royal Society of South Australia.

His colleagues wish Dr. and Mrs. Piper a long and happy retirement.

GIFT WINNER



Des Leedham, who is in charge of the Division of Plant Industry's Correspondence Records Section in Canberra, recently won the North Sydney League's Club Gift, worth £800 to the winner.

It is the second richest foot-race in the world, only the Bendigo Thousand offering higher prize money.

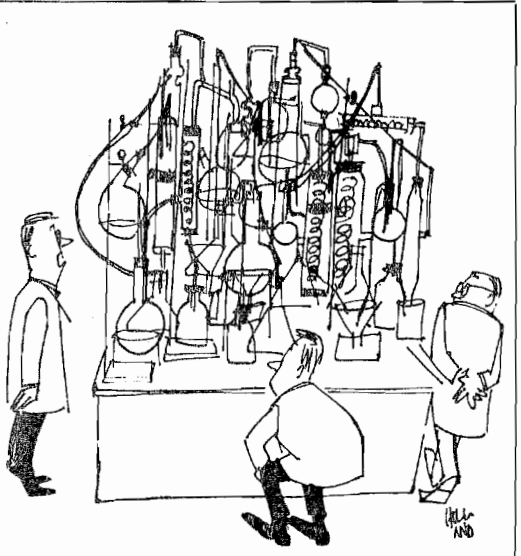
Des ran off 4¾ yards and competed against most of the top professional sprinters in Australia.

A member of a well known Adelaide sporting family, Des came to Melbourne in October, 1961, where he felt there were more opportunities for him in his chosen sport. At the same time he joined C.S.I.R.O. and worked in Head Office Records Section until September, 1962, when he was promoted to his present position in Canberra.

Des now has his sights set on other big professional events between now and Easter. All being well, he'll be among the back markers to face the starter at Wangaratta, Bendigo, Stawell, South Sydney and Canberra. In between these events, he may squeeze in a smaller race or two to help retain his form and he hopes, swell his winnings.

Des's real interest is in the sport itself rather than the prize money, though he admits this has its attractions. He has a keen interest in Canberra Amateur Athletics, where he is already coaching a number of promising juniors.

When Des retires from competitive running, he intends to devote his leisure hours to the coaching and training of youngsters. In the off-season, by way of relaxation, he umpires football.



"He must be in there somewhere — he was helping me to set it up!"

Courtesy "New Scientist".

APPOINTMENTS TO STAFF

Mr. A. J. R. Bennett, a petrologist, has joined the staff of the Division of Coal Research. Since graduating in geology at London in 1952 he has been on the staff of the U.K. National Coal Board's Coal Research Establishment at Cheltenham.

Mr. P. D. Berwick arrived in Australia last month to take up a technical administrative post with the Division of Meteorological Physics. A graduate of University College, London, he has worked for the last ten years as a meteorologist in East Africa.

Mr. W. L. Braithwaite has joined the staff of the Division of Wildlife Research, where he will assist the Chief in studies on the ecology of wild ducks. Mr. Braithwaite recently graduated in zoology at the University of Sydney.

Mr. W. L. BRAITHWAITE

Mr. J. L. Corbett is en route to Australia to take up a position at the Armidale Pastoral Research Laboratory. A graduate of the Universities of Reading and New Zealand, he has latterly been in charge of the Grassland Utilization Section at the Rowett Research Institute, Aberdeen.

Dr. G. Gartside has joined the staff of the Division of Chemical Engineering. For the past three years he has been working for his Ph.D. degree in the Chemical Engineering Department, Kings College, Newcastle on Tyne.

Dr. G. GARTSIDE

Dr. P. L. C. Grubb, a graduate of Cape Town and St. Andrew's Universities, has joined the staff of the Mineragraphic Investigations Section. He has had field geological experience in Southern Rhodesia, Bechuanaland, Canada and Malaya.

Miss Margaret S. Lloyd, who recently completed her honours degree at Sydney, has joined the staff of the Division of Food Preservation. She will study post-mortem biochemical changes in muscle.

Dr. Adele Millerd has joined the staff of the Division of Plant Industry. A graduate of Sydney University, she has been on the staff of the Waite Institute in Adelaide since 1959. Prior to that, Dr. Millerd held research appointments at the California Institute of Technology, the University of Sydney, and the McCollum-Pratt Institute, Johns Hopkins University.

Dr. A. J. Michell has joined the staff of the Wood Chemistry Section of the Division of Forest Products. A graduate of the University of Western Australia, he has just completed a two-year post-doctorate fellowship in the Molecular Spectroscopy Section of the Canadian National Research Council.

Dr. A. J. MICHELL

Dr. B. G. Newsom has been appointed to a three-year fellowship in the Division of Protein Chemistry. For the last three years he has been working for his Ph.D. at the Institute of Cancer Research in London.

Dr. C. F. Soo Hoo, a graduate of the Universities of California and Illinois, has been appointed to the staff of the Division of Entomology. He will study the ecology of pasture pest species in the New England area.

Dr. C. F. SOO HOO

Dr. K. J. Reid is now en route to Australia to take up a position with the Division of Chemical Engineering. A graduate of the Universities of Birmingham and Cambridge, he recently held a Commonwealth Fund Fellowship at the University of California, Berkeley.

Mr. P. J. Pahl has been appointed to the staff of the Division of Mathematical Statistics. He will be stationed in Melbourne at the Division of Forest Products. Mr. Pahl recently completed an honours degree in mathematics at Adelaide.

Premiere of Prize Play

'When the Gravediggers Come', by Robert Amos (the playwriting alter ego of Bob Schoenfeld, of the Editorial Section), will have its first performance towards the end of March at the Emerald Hill Theatre, South Melbourne.

The Emerald Hill is a small but fully professional theatre which, during the past year, has earned much praise from newspaper critics for its imaginative productions.

Bob's play will be directed by well-known producer, Wal Cherry. Casting is now in progress, and leading roles will be played by Lloyd Cunningham, Stuart Weller and George Whaley.

The play won equal first prize in the Sydney Journalists Club playwriting competition last year. It was described as "thoughtful, powerful and dramatic".

A radio version of another Robert Amos play, "A Country for Proud People", was recently broadcast by the A.B.C.

Rotary Fellowship

A Rotary Foundation Fellowship is available for the year 1964-65. Applicants must be single male Australian citizens, between the ages of 20 and 29 on 1st July, 1964.

The Fellowships are calculated to cover the cost of the return fare, tuition fees, books and educational supplies, living for one academic year and limited travel in the country of study.

Applications are required by 15th March. Further particulars may be obtained from Head Office.

Money Is Available

The Laboratories Credit Union Co-operative (Sydney) has funds available for loans up to £500. A lien on accumulated superannuation contributions is generally satisfactory security.

Moneys on loan at present exceed £50,000. Prospective borrowers should contact the Secretary, Stan Ryan, at the Administrative Office, or any Director of the Co-operative, for further details.

Potash Prize

The International Potash Institute (Berne) has organized a competition for young research workers in which prizes will be awarded for papers on the chemical, biological or physiological role of potassium in the soil, in the vegetable realm or in the animal organism, including the field of human nutrition.

- A sum of 4,000 Swiss Francs will be awarded as prizes.
- Competitors must be under forty years of age.
- Both published and unpublished papers may be entered provided that they were completed in 1961 or 1962.
- The texts of papers complying with the above conditions must reach the International Potassium Institute, 30 Zieglerstrasse, Berne (Switzerland), not later than April 30, 1963.

Further information may be obtained from Head Office.

Deniliquin Field Day

A Visitors' Day will be held at the Falkiner Memorial Field Station on 27th March. Visitors will have the opportunity to inspect and discuss current irrigated and dryland pasture experiments.

Printed by C.S.I.R.O., Melbourne.

049##1963

CORESEARCH

FOR CIRCULATION AMONG MEMBERS OF C.S.I.R.O. STAFF — NUMBER 49, MELBOURNE, APRIL 1963

Elizabethan Science Fellowships

The Prime Minister (Sir Robert Menzies) announced on 12th March the establishment of ten post-doctoral fellowships in physical and biological sciences. The fellowships, to be awarded annually, will be known as the Queen Elizabeth II fellowships.

Sir Robert said the fellowships were the Government's gift to commemorate the Queen's visit to Canberra for the jubilee celebrations.

Full details of the fellowships are not yet known but Government officials hope to announce plans soon.

The Prime Minister made his announcement before the Queen at an open-air ceremony in front of Parliament House to honour Canberra's jubilee.

The Government had sought a fitting way to show its appreciation of the Queen's visit and to mark it in some permanent fashion, he said.

Turning to the Queen, Sir Robert said: "We know that you and Prince Philip are deeply interested in education and scientific research.

"Having these things in mind, we have decided to provide each year ten post-doctoral fellowships tenable in Australia in the physical and biological sciences.

"The fellowships will be awarded to any scientists of high distinction from Australia and Britain on the completion or shortly after their completion of their doctorates in philosophy."

The Queen said she was delighted to have her name associated with the fellowships.

"These fellowships are a stake in the future," she said.

HONOURS

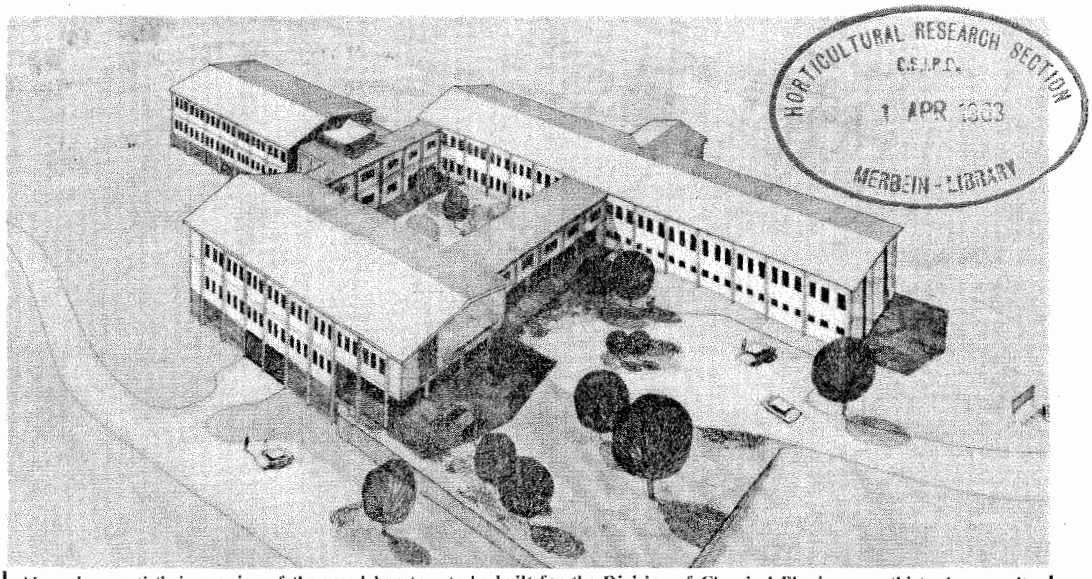
The Australian Institute of Agricultural Science has awarded Dr. R. L. Reid, of the Division of Animal Physiology, the Australian Medal of Agricultural Science for 1963 for his outstanding contribution to the knowledge of pregnancy toxaemia of ewes.

Dr. Reid has established a number of important principles relating to the metabolism of sheep and has developed physiological criteria for determining the state and extent of under nutrition of ewes in late pregnancy. In doing this, he has developed a new approach to the study of the nutritive requirements of the pregnant ewe.

The Institute has also elected **Professor C. M. Donald** as its President for 1963. Professor Donald is Professor of Agriculture at the University of Adelaide and Head of the Department of Agronomy at the Waite Agricultural Research Institute. He was for some years an officer with the Division of Plant Industry and is now a member of the Advisory Council.

Mr. G. Lorenz, of the Division of Applied Physics, was recently elected to membership of the International Institute of Production Engineering Research.

NEW CHEMICAL PHYSICS LABORATORY



HORTICULTURAL RESEARCH SECTION C.S.I.R.O. 1 APR 1963 MERBEIN - LIBRARY

Above is an artist's impression of the new laboratory to be built for the Division of Chemical Physics on a thirty-six acre site next to Monash University, Melbourne. It will be named the David Rivett Laboratory. A contract for £441,750 has been let to Keith J. Hooker Pty. Ltd. and the building is expected to be completed in September, 1964. The laboratory, which has been designed by the Commonwealth Department of Works, includes special structural designs to eliminate as far as possible all vibration in the building. This was necessary because of the extremely sensitive nature of the equipment to be installed. The building will provide accommodation for one hundred people.

Visitors from Abroad

Dr. F. P. Bowden, Reader in the Laboratory for Physics and Chemistry of Solids, Cavendish Laboratory, Cambridge, and former Chief of the Division of Tribophysics, is at present spending a fortnight in Australia before flying to Japan where he has been asked to give a series of lectures to the Aeronautical Research Institute.

While in Australia he will visit a number of C.S.I.R.O. laboratories and will lecture on radiation damage to solids and deformation and friction of solids travelling at high speeds.

Professor J. B. Speakman, Head of the Department of Textile Industries, University of Leeds, and President of the British Textile Institute, is spending a month visiting Australian wool research laboratories and attending a number of wool research conferences.

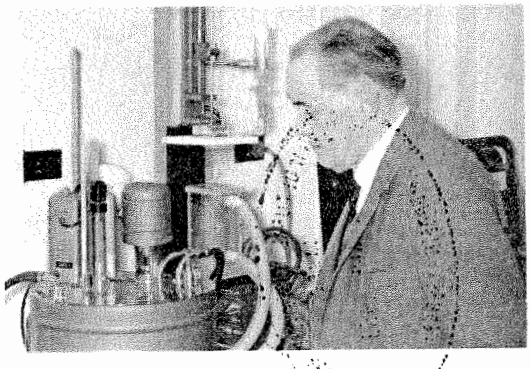
Professor Speakman recently addressed a C.S.I.R.O. conference on shrink-proofing at Ryde, Sydney, and spoke at a symposium at the University of New South Wales on the future of wool.

He also opened a conference on new developments in the textile industry, organized by the Victorian section of the Textile Institute at the Gordon Institute of Technology, Geelong.

Dr. E. W. Russell, Director of the East Africa Agricultural and Forestry Research Organization, Kenya, will return home shortly after having spent a month in Australia looking at soil research in C.S.I.R.O. Dr. Russell has also taken the opportunity of seeing something of the soil work being conducted by universities and State Government departments.

Dr. E. W. RUSSELL

Professor J. B. Speakman at the Division of Textile Physics.



More Money Wanted

Last month, "Coresearch" reported that the Laboratories Credit Union Co-operative (Sydney) had surplus funds available for loan.

This month, its Melbourne-based counterpart, the C.S.I.R.O. Co-operative Credit Society Limited, reports a shortage of funds.

The Society urgently needs investors to enable it to carry out more effectively its important loan programme within the Organization. A gilt-edged security investment of 6% per annum is offered to those wishing to place money on deposit with the Society for 12 months or more. Lower rates are paid for shorter periods.

Many recent loans made by the Society have been for second mortgages. The gap between advances made by building societies, insurance companies, or other financial institutions and the ultimate cost or purchase price of a home is rapidly increasing.

The Society has helped many members to bridge this gap. Invariably, the maximum loan of £1,000 is sought. Such loans, together with refunds of invested money, have made inroads in the Society's resources. Loan repayment money, though considerable, is not sufficient to meet present commitments.

The waiting period for loans is now of the order of 3-4 months. Increased investment will shorten this period considerably. All members of the Organization and their close relatives are eligible to invest in the Society. Deposits are refunded on demand but longer notice should be given if large amounts are to be withdrawn.

APPOINTMENTS VACANT

The following vacancies for professional appointments are current:—

AGRICULTURAL ASSESSMENT OFFICER (R.O./S.R.O.)—Division of Land Research and Regional Survey. 618/129 (April 12).

PLANT PHYSIOLOGIST (R.O./S.R.O.)—Division of Plant Industry. 130/548 (April 12).

RESEARCH CHEMIST (S.R.O./P.R.O.)—Division of Mineral Chemistry. 601/10 (April 12).

RESEARCH OFFICER (R.O.)—Division of Radiophysics. 780/296 (April 12).

EXPERIMENTAL OFFICER FOR MARSUPIAL INVESTIGATIONS (E.O.1/2)—Division of Wildlife Research. 560/134 (April 15).

ORGANIC CHEMIST (E.O.1/2)—Division of Biochemistry and General Nutrition. 230/120 (April 15).

CHEMICAL ENGINEER or APPLIED CHEMIST (E.O.1/2)—Division of Chemical Engineering. 608/33 (April 19).

EXPERIMENTAL OFFICER FOR KNITTING INVESTIGATIONS (E.O.1/2)—Division of Textile Physics. 465/177 (April 19).

RESEARCH OFFICER (R.O.)—Division of Coal Research. 480/428 (April 19).

EXPERIMENTAL OFFICER (SOIL PHYSICS & MECHANICS) (E.O.1/2)—Soil Mechanics Section. 277/53 (April 26).

EXPERIMENTAL OFFICER (SOIL STABILIZATION) (E.O.1/2)—Soil Mechanics Section. 277/52 (April 26).

RESEARCH OFFICER (SOIL MECHANICS) (R.O.)—Soil Mechanics Section. 277/51 (April 26).

RESEARCH OFFICER (SOIL PHYSICS & MECHANICS) (R.O.)—Soil Mechanics Section. 277/50 (April 26).

SCIENTIFIC ASSISTANT TO OFFICER-IN-CHARGE (S.S.O.2/3)—Soil Mechanics Section. 277/44 (April 26).

CHEMIST or CHEMICAL ENGINEER (R.O./S.R.O.)—Division of Chemical Engineering. 608/27 (May 3).

RESEARCH OFFICERS (R.O./S.R.O.)—Computing Research Section. 983/3 (May 31).

e/ 607(085.3) CO. C((OR)

Abstracting - A Growing Problem

One of the greatest problems facing the scientist today was that of keeping himself informed of what was going on in his particular field, said Mr. W. Ives, Associate Member of the Executive, in his presidential address to the Victorian Branch of the Australian Institute of Agricultural Science last month.

It would be enough, he said, if the problem were to find time to read what must be read, or even perhaps what should be read, but in fact the problem often boiled down to making time to trace what simply must be read from amongst the enormous mass of documentation available.

The world list of scientific periodicals at present included about 50,000 titles and was growing every year.

It had been calculated that if the number of publications kept on growing at the present rate the total weight of scientific publications would in a few hundred years exceed the weight of the earth.

Some attempt was, of course, being made to cope with this vast flood of literature by the publication of abstracts, said Mr. Ives.

There were hundreds of journals containing abstracts, the more important ones used by the agricultural scientist being Chemical Abstracts, Biological Abstracts and the seventeen separate journals of the Commonwealth Agricultural Bureaus.

The Commonwealth Agricultural Bureaus were set up in 1928 and were an integral part of the machinery of the British Empire. They evolved from an appreciation among Empire countries of the advantage of having one group to scan all the agricultural literature and to print abstracts which all could use.

With the gradual evolution of the Commonwealth of Nations from the former British Empire the administrative arrangements for C.A.B. had undergone a number of changes.

Contributions were made by member countries on an agreed basis related vaguely to the capacity to pay.

The C.A.B. abstracts were used extensively. A wide range of journals in all languages was scanned by each Bureau, and their abstracting encompassed a good proportion of the important papers published in most of the countries doing agricultural research.

However, as the extent of the literature was increased, these volumes of abstracts had become more and more bulky, and much thought was being given to ways in which the ever increasing bulk of scientific literature could be more ably handled.

Mr. Ives said that the growing cost of this work had focussed attention on the budgeting burden which it imposed on member countries.

He felt that it was somewhat anomalous that the burden of the cost of these tasks should be borne solely by Commonwealth countries, especially when other very large and important countries such as the U.S.A., U.S.S.R., China and Japan had an enormous interest in agricultural research.

Australia was contributing almost £A100,000 a year to C.A.B. and for this it received, free of charge, supplies of journals which any non-contributing country could buy for less than £A4,000 a year.

"The paradox of contributors paying much more for their abstracts than non-contributors was scarcely one that could be allowed to continue indefinitely," said Mr. Ives.

"It was quite possible that if C.A.B. had not been so well established prior to the advent of F.A.O., agricultural abstracting might have been undertaken by the latter organization."

In 1962, U.N.E.S.C.O. issued a report which drew attention to some of the inadequacies of existing abstracting services in the various branches of science and technology.

As a result of this, U.N.E.S.C.O. had agreed that a number of working parties, composed of representatives of all groups interested in the problems of scientific documentation, should be convened during 1963.

These working parties would work out proposals for practical solutions to the problems of abstracting and would submit their proposals to a final conference in 1964 which would be instructed to look for ways and means of carrying out the recommendations of the working party.

Mr. Ives pointed out that the U.N.E.S.C.O. report was strongly in favour of using authors' summaries wherever possible, since half the cost and more than half the time required to provide an abstract journal was absorbed by the preparation of abstracts.

Authors' abstracts were still suspect in many quarters on the grounds that some authors exaggerated the importance of their own work and that they might include in their abstract claims which were not made in the paper itself.

However, this could be overcome if the editors of scientific journals were willing to give the authors' summaries the same critical scrutiny as they gave to the authors' papers.

It was clear from the present difficulties in coping with the ever-growing volume of scientific literature that abstracts must be improved, said Mr. Ives.

TECHNICAL ASSOCIATION NEWS

General Meetings

The Annual General Meeting of the Association will be held on Friday, 24th May, at the Division of Forest Products, Melbourne. The Victorian Branch General Meeting will be held on the same night.

We would like a good attendance, not merely to formally approve the usual reports but to hear your views and to tell you about our future plans.

We are offering a new attraction this year — no films.

Elections

Nominations for Federal President, General Secretary, General Treasurer and Publicity Officer close on 22nd April. These positions must be filled by N.S.W. members.

Victorian Branch elections will be held on 30th April. Mr. Brian Banks, of Publishing Section, Melbourne, is Returning Officer for both elections.

Branch elections are also being held in other States.

Most of our candidates are returned unopposed but please don't assume that all positions are spoken for beforehand, and that it is bad form to intrude.

If you consider yourself the best man, then let us have your nomination.

"When the Gravediggers Come", by Robert Amos (otherwise Bob Schoenfeld of the Editorial Section) is now playing at the Emerald Hill Theatre, Melbourne. Our picture shows the author discussing a sketch of the set with the designer, Jane Norris.

Edgeworth David Medal

The Royal Society of New South Wales has awarded the Edgeworth David Medal for 1962 to Mr. R. F. Isbell of the Division of Soils.

Mr. Isbell has carried out extensive field surveys over the last ten years in the underdeveloped 20-30 inch rainfall country of Queensland.

He has mapped and assessed large areas almost all of which were either virgin land or in a relatively low stage of development.

His contribution has been in the definition of soil resources and their relation to land use.

Mr. Isbell recently published the results of a survey of nearly 40,000 square miles in a zone in central and southern Queensland and northern New South Wales comprising the Brigalow belt.

This survey has already been used extensively by economists and others concerned with land use and will be a classic reference for the future, especially as vegetation and land usage will change drastically with development.

The Division of Building Research is investigating the use of epoxy resins as materials for binding together concrete blocks.

Twenty-five Years in Canberra

The Queen and the Duke of Edinburgh last month joined the people of Canberra in celebrating the fiftieth anniversary of the foundation and naming of our national capital.

Although C.S.I.R.O. is only half as old, it has from its very earliest days been closely associated with Canberra.

For the first year or two after its establishment by the Bruce Government in 1926 the Council for Scientific and Industrial Research owned no buildings and its handful of scientists was scattered all over Australia.

However, before long the Council began to organize and to build.

Four research divisions were created and it was decided that two of them, the Division of Economic Botany (now the Division of Plant Industry) and the Division of Economic Entomology, should be situated in Canberra at Black Mountain.

Although the location of the Divisions at Canberra had certain disadvantages at that time, it was felt that as Canberra was the administrative and political centre of the Commonwealth, it would, with the growth of population and with the construction of the proposed University nearby, become as suitable as any one place could possibly be for the headquarters of the two divisions.

Originally it was planned that each Division should have a laboratory and that the two buildings of "chaste and simple design" should be linked by an administrative block.

However, building of the administrative block was delayed and it was not constructed until some time after the war.

The two laboratories were completed during 1929-30 and the two Divisional Chiefs, Dr. B. T. Dickson and Dr. R. J. Tillyard, were settled in with a staff of some two dozen scientists.

Over the years the Divisions of Plant Industry and Entomology have grown steadily in size and reputation and Plant Industry is now the largest of all the C.S.I.R.O. Divisions.

During the 1950's, when it was led by Dr. O. H. Frankel, it spawned two other Divisions — the Division of Tropical Pastures, located in Brisbane, and the Division of Land Research and Regional Survey, which established its headquarters in Canberra.

Under the leadership of Mr. C. S. Christian, and more recently Mr. G. A. Stewart, the Division of Land Research and Regional Survey has been systematically evaluating Australia's land resources, concentrating particularly on our vast, underdeveloped regions.

In 1949 the Wildlife Research Section (now the Division of Wildlife Research) was set up under the leadership of Mr. F. N. Ratcliffe to study Australia's native fauna and to tackle the rabbit problem.

The Division of Soils also established a laboratory in Canberra, to carry out research in south-eastern Australia.

C.S.I.R.O. has been involved recently in an active building programme in Canberra.

In the last couple of years Plant Industry has built a new biochemistry laboratory, and in November last year the Prime Minister opened the £600,000 phytotron, which is one of the world's finest plant research facilities.

Recently, a contract for more than £150,000 was let for the construction of a laboratory for the Division of Land Research and Regional Survey.

This building will be finished by the end of the year and the Division plans a second new building to follow it.

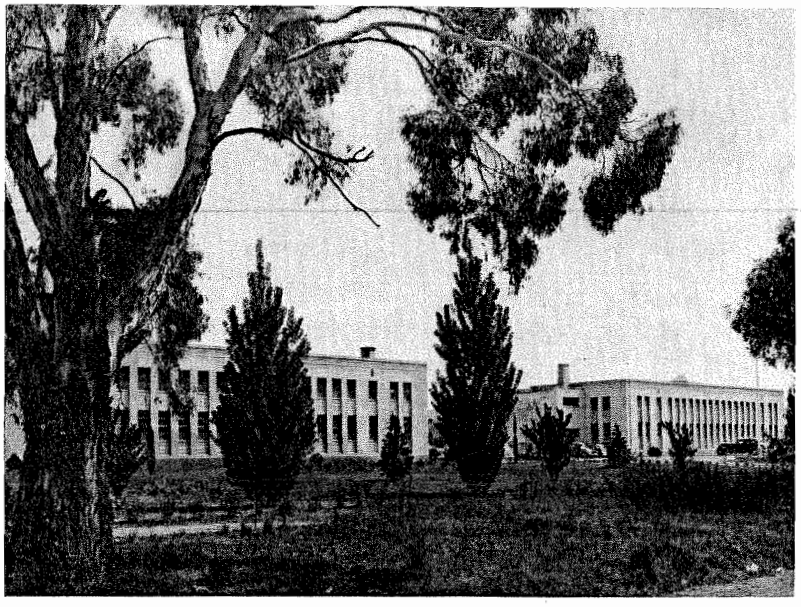
Canberra has also been chosen as the site for the recently established Computer Research Section's central computer which will be integrated with satellite computers in other States.

The first stage of the project will cost more than £1¼ million and a £100,000 building will be erected in Canberra soon to house the central computer.

Draft plans have been prepared but final design details cannot be settled until the computer has been chosen. Tenders for the computer are now being examined.

At present there are more than eight hundred C.S.I.R.O. staff in Canberra, and it is expected that it will not be long before there are more than one thousand employed there.

C.S.I.R.O.'s main building at Black Mountain was originally constructed as two separate laboratories for the Divisions of Entomology and Plant Industry. They were not linked together by the central administrative block until after the War.



OVERSEAS VISITS

Mr. E. F. Biddiscombe, of the Division of Plant Industry, left recently to spend eight months in Europe and North America. He will spend most of his time doing research in the Physics Department of the Rothamsted Experiment Station in England.

Dr. E. G. Bowen, Chief of the Division of Radiophysics, returned recently from a short trip to the United States. He had been invited to America to advise the Massachusetts Institute of Technology on giant radio telescope problems.

Dr. D. T. Downing, of the Division of Organic Chemistry, left last month for England. He will spend five months at the Shell Enzymological Institute at Sittingbourne, Kent. Dr. Downing is spending four weeks in the United States on his way to England.

Mr. D. H. Fox, of the Division of Applied Physics, is at present spending six months in Britain and Europe. The main object of his visit is to study force and hardness testing at the National Physical Laboratory at Teddington.

Mr. H. J. Frith, Chief of the Division of Wildlife Research, left last month for a ten weeks visit to South-East Asia, England, Europe and North America. He will visit the Severn Wildfowl Trust in England, the Delta Waterfowl Research Station in Canada and a number of other research stations and universities.

Dr. R. G. Giovanelli, Chief of the Division of Physics, is at present making a short trip overseas. He has just represented Australia at an assembly of the International Year of the Quiet Sun organization in Rome.

Dr. E. M. Hutton, of the Division of Tropical Pastures, left Australia recently to visit a number of research centres where the genetics and breeding of tropical pastures are studied. Apart from visits to the United States, Canada, Japan and the Philippines, he will visit a number of Latin American countries, including Mexico, Guatemala, Costa Rica, Panama, Jamaica and Puerto Rico.

Dr. W. K. R. Lippert, of the Division of Building Research, left last month on a five-months trip to various countries in Asia, Europe, and North America. He will visit acoustic research laboratories and discuss recent advances in acoustical research.

Dr. E. G. McRae, of the Division of Chemical Physics, left recently for the United States where he has accepted an invitation to work with the Chemical Electronics Section of the Bell Telephone Laboratories, New Jersey, for a period of twelve months. Dr. McRae will undertake studies of the surface structures of metals and semi-conductors by means of low-energy electron diffraction.

Dr. J. M. Rendel, Chief of the Division of Animal Genetics, is at present on a five months visit to the United States, England and Holland. He will attend an International Zoological Conference in Washington in August and an International Genetics Congress in Holland in September.

Mr. G. A. Stewart, Chief of the Division of Land Research and Regional Survey, has just returned from a short visit to Jodhpur, where he has acted as a consultant to the Basic Resources Studies Division of the Central Arid Zone Research Institute.

Mr. A. J. White, of the Division of Tribophysics, has been granted twelve months leave to accept an assignment in Argentina. He is going to assist in the establishment of a department of metallurgy at the National University at San Luis.

Dr. J. B. Willis, of the Division of Chemical Physics, will spend a total of six months in the United States and Britain visiting various institutional and industrial laboratories, including a three months stay at the National Chemical Laboratory, Teddington. Dr. Willis has been asked to present papers at the Gordon Conference on Instrumentation, New Hampshire, and at the Fifth Congress on Clinical Chemistry, Detroit.

Mr. J. T. Woodcock, of the Ore Dressing Section, is at present abroad on a trip of five months' duration. He has already attended a conference on hydrometallurgy at Dallas, Texas, and will attend the VIth International Mineral Processing Conference in Cannes next month.

COMPETITION RAISES £6,000 FOR CHARITY

Miss Fran Miller, a 19-year-old Technical Assistant in the Division of Entomology, was C.S.I.R.O.'s candidate in the recent Canberra Jubilee Princess Competition.

The competition was organized to coincide with the Royal Visit and the Canberra Jubilee Celebrations. There were twenty-six candidates sponsored by various Government Departments and private firms. To be eligible for judging each candidate had to raise £50 for a charity, which could be nominated by her.

Miss FRAN MILLER

C.S.I.R.O.'s selected charity was the Spastic Centre in Mosman and all money raised by Fran will be used to finance treatment for local spastic children.

The first prize — judged on beauty, personality, and poise — is a trip to Hayman Island for two, plus £20 spending money, or £200 in cash.

In addition, there was a Miss Charity title for the girl who raised the most money. Fran raised £332, which placed her third.

Altogether, the competition raised an amount close enough to £6,000. C.S.I.R.O. raised its amount from a number of social evenings, including a woolshed dance and barbecue at Ginninderra.

"I'm sure I'll be able to do better, sir—once I can shake off that feeling that I'm violating Nature's secrets."

Copyright London Punch.

Netherlands Scholarships

Three scholarships are being offered by the Netherlands Government to advanced Australian students wishing to study in the Netherlands during the academic year, 1963-64.

These scholarships are tenable for a nine or ten months' period of study at a university or other institution of higher learning in Holland and are valued at N. f4000 (A.£493 approx.).

This amount allows N. f3000 (A.£370 approx.) for living expenses during the academic year and N. f1000 (A.£123 approx.) as a contribution to travel costs. Scholarship holders will be exempt from payment of university fees.

The academic year in the Netherlands runs from October until June but it will be possible for students to use the scholarships for a period beginning in January, 1964.

Preference will be given to candidates with some elementary knowledge of the Dutch language. No restrictions are prescribed regarding fields of study.

Further particulars are available from Head Office.

Vet's Place in Changing World

The public image of the veterinarian is not in step with the times, Dr. R. F. Riek of the Veterinary Research Laboratory, Yeerongpilly, stated in his presidential address to the annual general meeting of the Queensland Division of the Australian Veterinary Association in Brisbane.

The modern veterinarian, he pointed out, was an authority on animal husbandry (genetics, nutrition, breeding, production), parasitology, pathology and bacteriology, besides being the classical horse or animal doctor.

"The veterinarian today," he declared, "should be concerned more with maintaining the health of animals on a herd basis than the treatment of individual sick animals."

Dr. Riek said an efficient veterinary service was essential in any country if animal diseases were to be controlled and eradicated and if animals were to be kept in good health in order to keep the cost of livestock production to a minimum.

ASTRONOMERS MEET

Distinguished astronomers from Australia and overseas visited the C.S.I.R.O. 210-ft. radio telescope at Parkes recently during a major international astronomical symposium on the Galaxy and Magellanic Clouds.

The symposium was sponsored jointly by the International Astronomical Union and the Union Radio Scientifique Internationale, and was held under the auspices of the Australian Academy of Science.

It was the first international astronomical symposium ever held in Australia.

Opening the conference at the Mount Stromlo Observatory, the Astronomer Royal, Sir Richard Woolley, said that Australia's contribution to astronomy was quite out of proportion to its size.

"The work by the Parkes radio telescope has done a great deal to increase the importance of Australia in world astronomy," he said.

Australia's largest optical telescope at Perth was only seventy-five inches in diameter. A new one would need to be at least 120 inches.

Hardly Cricket

The Chemical Research Laboratories played their annual Cricket Match against the Division of Tribophysics on 6th March at Royal Park.

The match was one of a series which has been going on for years. The first one was played on 18th February, 1949.

The rival captains, K. J. Fogarty (C.R.L.) and G. W. West (Tribophysics), tossed, and Kevin Fogarty won. He sent Tribophysics in to bat.

The scores were as follows:

Tribophysics

Daunt, b. Newnham	41
Lowe, b. Newnham	4
Mercer, b. Watts	8
West, c. Wadsley, b. Watts	0
Nicholas, c. Wadsley, b. Watts	0
Davis, c. Sullivan, b. Watts	0
Hargreaves, l.b.w., b. Watts	2
Segall, c. Watts, b. Walsh	31
Esdaile, c. and b. Newnham	0
Spink, not out	5
Smith, c. Wignall, b. Vines	14
Total	109

Bowling: Newnham 3/17, Watts 5/20.

Chemical Research Laboratories

Vines, run out	7
Sullivan, st. West, b. Mercer	23
Scullin, retired	54
Dawson, b. Nicholas	4
Wadsley, c. Mercer, b. Smith	9
Watts, c. Mercer, b. Lowe	12
Newnham, b. Lowe	6
Walsh, c. Hargreaves, b. West	7
Fogarty, st. Segall, b. West	4
Coogan, c. Hargreaves, b. West	16
Wignall, not out	16
Extras	8
Total	166

Bowling: Lowe 2/23, West 3/25.

On the face of it, Chemical Research Laboratories won the match.

But close examination of the score book later revealed that

(a) three Tribophysics bowlers had uncompleted overs;
(b) three C.R.L. wickets fell at 118 without at least one batsman being out for nought;
(c) Smith captured a wicket without any overs being credited to him.

APPOINTMENTS TO STAFF

Mr. J. E. Baker has accepted a temporary appointment with the Division of Applied Physics. He will carry out experimental work associated with hardness and force measurements.

Mr. D. R. Bath has been appointed to the staff of the Plant Introduction Section, Division of Plant Industry. A graduate of the Universities of Reading and New Zealand, he has been in Kenya for five years as Deputy Principal of Egerton Agricultural College. Mr. Bath arrives in Australia in two weeks time.

Mr. P. S. DAVIS

Mr. P. S. Davis, a former staff member of the Division of Fisheries and Oceanography, has joined the staff of the Horticultural Research Section. Since leaving C.S.I.R.O. in 1957 he has been with the Australian Atomic Energy Commission. He recently obtained an M.Sc. degree from the University of New South Wales.

Mr. B. M. Bindon, a graduate in rural science from New England, has joined the staff of the Division of Animal Physiology. He will be based in Brisbane, and will study the influence of improved pasture species on nutrition and reproduction in beef cattle.

Mr. M. G. Farrand has joined the staff of the Mineragraphic Investigations Section. Since graduating M.A. and B.Sc. from Oxford he has been in Africa for six years, as a geologist and mineralogist in Rhodesia, Tanganyika and Ghana.

Mr. M. G. FARRAND

Dr. H. Doing is now en route to Australia to join the Division of Plant Industry where he will study the ecology of skeleton weed. He was recently awarded a doctorate of agriculture by the Agricultural University of Wageningen, Holland.

Mr. A. I. Dunlop has been appointed Divisional Administrative Officer in the Division of Building Research. After five years' business experience in India he came to Australia in 1958 to read for an Arts degree at New England. Since graduating, he has been on the staff of the University's Department of Adult Education.

Dr. I. D. Campbell has joined the staff of the Division of Chemical Physics. A graduate of the Universities of Melbourne and London, he has been on the staff of the Defence Standards Laboratories since 1954.

Mrs. J. LEYENDEKKERS

Mrs. Jean Leyendekkers, a Sydney graduate, has been appointed to the position of Editor in the Division of Fisheries and Oceanography. For the last four years she has been teaching physics at Sydney Technical College.

Mr. D. D. Heath has joined the Division of Animal Physiology's Armidale Laboratory as a parasitologist. He completed his degree in rural science at New England in 1961, and has since then been working towards a master's degree.

Mr. J. H. G. Holmes has been appointed to the staff of the Division of Animal Physiology, where he will study the influence of improved pasture and legume species on nutrition and reproduction in beef cattle. He recently graduated in veterinary science at Sydney.

Mrs. Margaret Nelson has joined the staff of the Division of Entomology, where she will work on the metabolism and detoxification of insecticides. Mrs. Nelson holds an M.Sc. degree from the Victoria University, Wellington, N.Z., where she has recently been employed as a Lecturer.

Mr. R. T. Stewart, who recently completed his honours degree at Queensland, has joined the Division of Radiophysics. He will work on the interpretation of solar radio emissions.

Dr. D. S. Skene is at present en route to Australia to join the staff of the Division of Forest Products. An Aberdeen graduate, he has been for the past three years at the East Malling Research Station, working for his London Ph.D.

Mr. R. F. C. Smith has joined the staff of the Division of Wildlife Research, where he will study the reproduction of kangaroos. A recent graduate from Adelaide, he has worked in his long vacations with the Division of Entomology.

Mr. I. M. Parsonson, a veterinary surgeon, has joined the Division of Animal Health, where he will take part in research on pleuropneumonia.

Mr. I. M. PARSONSON

Since graduating in 1954 he has been in private practice in Sydney, Albury, and Kyabram (Victoria).

Miss Beverley Tugwell has joined the staff of the plant introduction section of the Division of Plant Industry. She recently completed a degree in botany at the University of Adelaide.

Dr. J. S. Russell has been appointed to the staff of the Division of Tropical Pastures. Since graduating Ph.D. from Nebraska in 1955 he has been a senior research officer in the South Australian Department of Agriculture.

Miss Anne de Vos, who recently graduated from Sydney University, has joined the staff of the Division of Entomology. She will take part in research on behavioural responses of insects which attack New England pastures.

Building Congress

The Second Australian Building Research Congress will be held in August, 1964, at the University of Sydney. The Commonwealth Experimental Building Station of the Department of Works will be host organization.

The first Congress was organized in 1961 by the C.S.I.R.O. Division of Building Research. The second Congress is expected to make a similar contribution to mutual understanding between building research and the building industry.

Two New Films

The Film Unit has released two new films. One is entitled "A Matter of Survival — Toxic Solvents", and the other "Sheepskins — An Aid to Nursing".

"A Matter of Survival — Toxic Solvents" was produced by the Film Unit, in collaboration with the Safety Officer and the Chemical Research Laboratories.

Its aim is to remind laboratory staff and others handling toxic solvents of the need for constant care. Not breathing vapours is the key to safe practices in handling solvents, and the film suggests how this can be achieved in the laboratory.

The film is in colour and has a screening time of nine minutes.

"Sheepskins — An Aid to Nursing" is in colour and has a screening time of 10 minutes.

For some time Mr. C. Garrow, of the Division of Protein Chemistry, and Professor M. Ewing, of the Melbourne University Department of Surgery, have been interested in the use of sheepskins as an aid to nursing bed-ridden and convalescent patients.

This film is intended to show the medical and nursing professions the worthwhile results achieved by using sheepskins, particularly in the nursing of older people.

A copy of the film has been sent to United Press Movietonews, in New York, and will be incorporated in a forthcoming edition of the U.S.I.A. Science Report, which is syndicated through the world in many language versions.

Copies of both films are available from the Film Library at Head Office.

Printed by C.S.I.R.O., Melbourne.

049-1963

050##1963
HORTICULTURE ... SECTION C.S.I.R.O. ... MAY 1963 ... LIBRARY

CORESEARCH

FOR CIRCULATION AMONG MEMBERS OF C.S.I.R.O. STAFF — NUMBER 50, MELBOURNE, MAY 1963

Move to Canberra

Last month the Chairman, Sir Frederick White, moved to Canberra, and established his own office there.

Sir Frederick has been encouraged to move to Canberra by the Prime Minister and the Minister-in-Charge of C.S.I.R.O., so that he will be in a better position to keep them informed about C.S.I.R.O.'s needs.

For a time, at least, the move will allow the Chairman to detach himself from some of the day to day executive activities which inevitably occupy his time at Head Office. He hopes to be able to spend more time visiting the Organization's research establishments.

The Executive, meanwhile, has been considering the question as to whether Head Office should be moved to Canberra. It believes that, sooner or later, such a move may be necessary.

Head Office now comprises only a minority of the staff located at 314 Albert Street, East Melbourne. Most of the staff at "Head Office" are now attached to the Melbourne Regional Office.

It is difficult to foresee just when the projected move to Canberra may take place.

It would take some time to prepare detailed plans for such a move. Not only would it be necessary to determine precisely who should go, but the difficulties of obtaining office accommodation and housing would have to be resolved.

It would also be necessary to obtain approval from the Government, and to reach agreement with the authorities responsible for the development plans for Canberra.

For all these reasons, it is not possible to predict when a move may take place. It seems highly unlikely that a move could be made within three to five years.

Essay Competition

The A.C.T. Group of the Royal Institute of Public Administration has invited entries for an Essay Competition to be decided in 1963.

Subject to the rules of the Competition, there will be a First Prize of £50, a Second Prize of £20 and such other awards for meritorious entries as the Group Council thinks fit.

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.

No precise length of essay is prescribed, but, since publication is proposed, the essay should not be less than 3,500 words.

Further information is available at Head Office.

Visitors to Forest Products

Mr. M. Monsalud, Director of the Forest Products Research Institute of the Philippines, was a recent visitor to the Division of Forest Products. Mr. Monsalud was in Australia as a Colombo Plan Special Visitor and his visit covered wood-using industries throughout Australia, in addition to the five days he spent at the Division.

Mr. R. A. Plumptre spent two weeks in the Division of Forest Products during March and April studying the utilization of plantation grown eucalypts. Mr. Plumptre, an officer of the Uganda Forest Department, has returned to the position of Utilization Officer in that Department.

THE MYSTERY OF 3C273

The 210 ft. radio telescope at Parkes has enabled a team from the Division of Radiophysics to pinpoint a mysterious star-like object which is puzzling scientists.

Since the middle of last year the team has been carrying out observations on radio sources as they are eclipsed by the moon.

This allows the position of the source to be fixed with great accuracy and provides useful information about its size and general shape; this method also has the advantage of being unaffected by refraction in the earth's ionosphere.

Parkes is one of the few places in the world where such observations can be profitably undertaken as this technique can only be used with large, fully-steerable radio telescopes.

A recent study of the eclipse of radio sources 3C273 showed that it was made up of two separate components, each of very small angular size.

The observations also made it possible to specify the position of both components with a degree of precision very much higher than has ever before been possible for a radio star.

As soon as these results were obtained they were sent to optical astronomers at the Mount Wilson-Palomar Observatories.

They found that the only objects near this position in a photograph taken with the famous 200 inch Mount Palomar Telescope were a faint thirteenth magnitude star-like object, which almost coincided with one of the radio components, and a faint wisp or jet (apparently proceeding from the star) whose tip coincided with the other radio component.

The identification of a radio source with an object that looks like a star is of considerable interest because the overwhelming majority of stars are not radio sources and do not have jets issuing from them which also emit radio waves.

However, this thirteenth magnitude "star", which is the origin of one of the components, is of very much greater interest still because its light shows a pronounced "red shift".

If this is a "cosmological red shift", that is, if the redness is due to the fact that the object is taking part in the general expansion of the universe and therefore receding from us, it is doing so at about one-sixth the speed of light.

It must therefore be very distant.

Since a star at that distance would not be visible, the object must be a galaxy.

However, if this was so it would need to be enormously brighter than any galaxy which has been observed before.

An alternative explanation is that the "red shift" is not due to recession of the object, but to the presence on the star of an extremely strong gravitational field.

However, if this was so, it would mean that the star was not made up of ordinary material but of neutrons so fantastically dense that a thimbleful might weigh millions of tons; it would also mean that the star was merely a few miles in diameter — a most unastronomical figure for a star.

A third possibility is that matter is being explosively ejected from a star within the earth's own Milky Way system.

The next clue to the mystery will probably come when some indication is obtained of how far away this unusual object is.

In the meantime, however, the discovery provides an interesting example of how radio astronomy is able to draw or direct attention to unusual objects in the sky and of the value to be gained from international co-operation in science.

The discovery was made possible by the wonderful observing facilities provided by the Parkes telescope; by information from the Royal Greenwich Observatory on the Moon's precise position at the time of eclipse which made an accurate determination of the position of the radio source possible; and by the incomparable optical facilities of the Mount Wilson-Palomar Observatories.

A group of radio astronomers visited the radio telescope at Parkes during the recent International Symposium on the Galaxy and Magellanic Clouds. From left, Mr. J. V. Hindman (Radiophysics), Professor J. H. Oort (from Leiden), Dr. R. H. Stoy (from the Royal Observatory, Capetown — mostly obscured by Dr. Bowen), Dr. E. G. Bowen, Professor V. A. Ambartsumian (U.S.S.R.), Dr. G. F. Mulders (National Science Foundation, U.S.A.) and Professor B. V. Kukarkin (U.S.S.R.).

POLISH POMOLOGIST

Professor Pieniazek, an eight-apple-a-day-man, is on a two month visit to Australia as part of a world tour to study fruit growing methods in different countries.

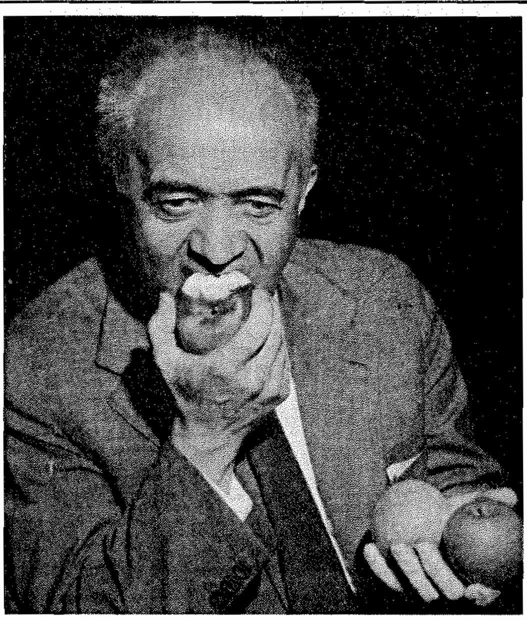
Professor Pieniazek is Professor of Pomology at Warsaw Central College of Agriculture and Director of the Research Institute of Pomology at Skierniewice, Poland, and a Member-Correspondent of the Polish Academy of Science.

While in Australia he will spend some time with the Division of Food Preservation.

He said that if he found any suitable strains of Australian apples he would consider introducing them into Poland where the apple constitutes fifty per cent. of the country's fruit crop.

Professor Pieniazek has already visited the United States and New Zealand and will return to Poland through Indonesia, the Philippines, Japan, Thailand and India.

Professor Pieniazek is the first of several scientists whose visits to Australia will be supported by the J. Ellerton Becker Fund of the Australian Academy of Science.



O f 607 (085.3) CO c/(COR)

Big Crowd Attends Deniliquin Visitors' Day

A crowd of some three hundred and fifty people attended the Visitors' Day held at the Falkiner Memorial Field Station, Deniliquin, on 27th March.

The attendance would perhaps have been bigger but for the good rains in many parts of the district which gave farmers an excellent chance to work their fallows.

Visitors travelled around the Station in a convoy of more than one hundred cars, to four stopping places to see demonstrations and hear specialist talks.

In presenting the results of Mr. R. H. Sedgley's work on heavy textured brown soils where water penetration was slow, Mr. L. F. Myers, the Officer-in-Charge of the Regional Pastoral Laboratory at Deniliquin, emphasised the importance of soil water storage in pasture production.

He suggested that expensive treatments like deep cultivation and heavy rates of broadcast gypsum might even be economic, because high production from small areas of irrigation was economical of water and labour.

Mr. G. Wright, Manager of the Station, showed the effects of tilth and depth of sowing on the establishment of white clover and paspalum on the heavy soils.

The trial shown confirmed the earlier result obtained with subterranean clover that a fairly rough tilth and surface sowing gave best establishment where dry sowings were irrigated up.

Where dissolved gypsum was used the tilth and sowing depth were not so important.

In all cases production, especially in the first year, depended on the number of seedlings established.

Miss Veronica Rogers showed the effects of more prolonged flooding on lucerne stands.

Where the lucerne was cut or grazed and then flooded immediately, the loss of stand was very marked, but where regrowth was allowed the stand stood up to flooding very well.

Miss Rogers pointed out that the reason grazed lucerne stands never lasted as well as stands cut for hay was twofold; grazing was often allowed before full flowering and watering often followed immediately after the removal of the sheep.

She said that both practices tended to kill out a high percentage of the stand.

Dr. J. Leigh demonstrated his work on the seasonal growth of dryland species and the high degree to which sheep selected their diet from the wide range of species available.

He said that the work was providing leads on the effects of different grazing management methods on the late summer feed shortage.

For example, if grazing pressure was moderate in the spring, some species, especially fissure weed (Kochia ciliata), were not eaten then and were preserved for later grazing when feed was short.

If summer grazing was too light, then summer grasses which did not carry over well would be wasted.

The role of perennial shrubs in times of stress was also being directly tested by encouragement and removal of the shrubs in grazed plots.

Mr. B. Millar showed his work on the effects of the surrounding dry land on small areas of irrigation and pointed out that the rate of water loss from pastures was increased by warm dry winds coming off dry land.

He gave estimates of this advection effect which suggested that isolated irrigated fields lost water at a much greater rate than large areas.

He said that where possible one large field was better than several small fields.

After lunch Mr. C. Kleinig demonstrated the importance of frequent irrigation in maximising the response of pastures to superphosphate.

Dr. J. Leigh addresses a group of graziers on the effect of grazing pressure on the occurrence of fissure weed in dryland pastures.

He said that high yields under irrigation required high super and plenty of water.

Neither could be effective alone and the effects of one enhanced the effects of the other.

If no response was obtained to superphosphate the first thing to suspect in the Riverina was lack of water due to hard soil and too infrequent irrigation.

One of the highlights of the visitors' day was an experiment aimed at finding what system of management led to maximum wool yield per acre from irrigated pastures.

The visitors were shown plots of irrigated sub clover *Phalaris tuberosa* pastures which had carried 9¼ dry sheep per acre for sixteen months continuously.

In the first twelve months wool production was 115 lb. greasy wool per acre.

At 8 sheep to the acre each sheep cut more wool per head; however, production of greasy wool per acre was only 96 lb.

Mr. Myers said that efforts to raise production by having a proportion of summer irrigated pastures based on white clover to increase wool growth rates in the summer period was not successful.

He said that continuous stocking of winter pastures based on sub clover was the best method so far devised on the station for low-cost, high production of wool from Merino wethers under irrigation.

The N.S.W. Department of Agriculture's district agronomist at Deniliquin, Mr. J. Noble, was asked to summarise what he considered some of the more important aspects of the visitors' day.

In doing this, Mr. Noble said that superphosphate was the basis of high pasture production and farmers must be prepared to spend money on it and water.

The possibilities of extending the irrigation season at either end should also be considered with concentration on perennial pasture species to help control barley grass.

Agricultural research in many cases was fundamental and complex and not directly applicable, he said.

He warned that unless farmers had a high standard of management they could not make full use of the information that was available for their properties.

C.S.I.R.O. STUDENTSHIPS FOR 1963

Four C.S.I.R.O. officers have been included amongst the overseas studentships awarded by the Organization for 1963.

These studentships provide financial support for graduate scientists who wish to continue their studies to fit themselves for careers in scientific research.

Altogether thirty-one junior, forty-seven senior and nineteen overseas studentships were awarded, after some three hundred and thirty-three applications had been considered.

The four C.S.I.R.O. officers who were awarded overseas studentships are:

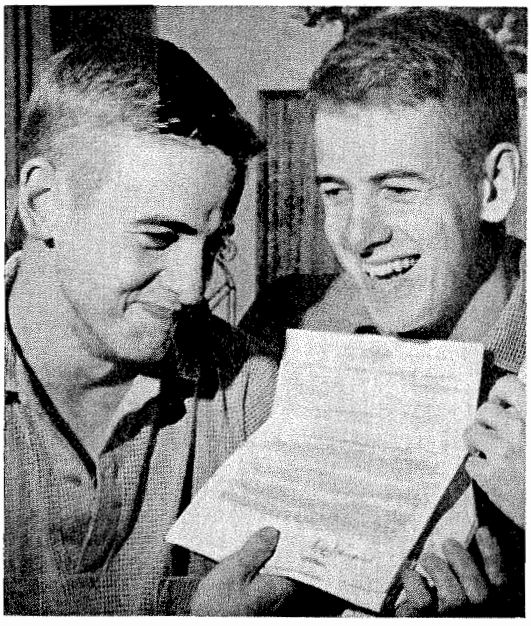
• **Dr. J. F. Brotchie** of the Division of Building Research will study the use of electronic computation in the optimization of structures at the Massachusetts Institute of Technology and Harvard.

• **Mr. P. May** of the Horticultural Research Station, Merbein, will undertake research studies on changes in grape buds just before and during inflorescence initiation, and on the development of grape buds in tissue culture at the Institute of Botany and Electronmicroscopy, Swiss Federal Institute of Technology, Zurich.

• **Dr. R. N. Oram** of the Division of Plant Industry will undertake advanced courses in plant physiology and genetics at the University of California, Davis. He will also visit experimental plant physiology centres in North America and Europe.

• **Dr. R. J. Porra** of the Division of Plant Industry will study biosynthesis of cytochrome prosthetic groups in yeast at the Department of Biochemistry, University of Oxford.

Included in the list of junior studentship winners were twenty-one-year-old Brisbane twins Noel and Leon Kane-Maguire; they both intend obtaining their honours degree in inorganic chemistry.



Our picture shows Noel (left) and Leon with their official letter of notification.

TECHNICAL ASSOCIATION NEWS

A Vote of Thanks

On 24th May the Association's Central Council will revert to N.S.W. after two years in Victoria.

The Victorians, despite some early inexperience, have handled their jobs well and merit a word of praise.

To the Federal President (Mr. N. G. Richards), the General Secretary (Mr. H. F. Heath), and to each person who served on the council we say "Sir, we thank you".

We expect great things of the incoming Council and hope all branches will extend it their complete co-operation.

While in this benevolent mood we have two further expressions of thanks.

Firstly, we thank the Editor of "Coresearch" for his guidance and forbearance and, secondly, we must thank the C.S.I.R.O. Executive and Messrs. G. McLennan and J. Coombe of Head Office, who have given our Association every courtesy and assistance.

It is worth emphasizing that our Association and C.S.I.R.O. are by no means diametrically opposed on matters of staff welfare.

Our proposals and complaints are always given the most serious consideration by the Executive.

Personal

Professor H. N. Barber, a member of the C.S.I.R.O. Advisory Council, has been elected a Fellow of the Royal Society, in recognition of his distinguished work in experimental cytology, population genetics, and the genetics of flowering.

Dr. B. Y. Mills, a former member of the staff of the Division of Radiophysics, has been elected a Fellow of the Royal Society in recognition of his contributions to radio astronomy and especially for development of the Mills Cross.

Mr. E. Eder, of the Division of Coal Research, has completed requirements for the B.Ec. degree of the University of Sydney.

Mr. G. P. Findlay, of the Plant Physiology Unit, Division of Food Preservation, has been awarded the degree of Ph.D. by the University of Tasmania. His thesis concerned the transient electrical behaviour of the membranes of *Nitella* species and *Chara australis*.

A recent textbook "Philippine Tektites" by H. Otley Beyer was dedicated to **Dr. George Baker** of the Mineragraphic Section:

"with admiration for the learning, diligence, and years of patient work that brought to completion on July 1, 1959, his unique monograph on the tektites — to which all subsequent efforts must necessarily take second place. With most pleasant recollections of our years of correspondence and interchange of ideas, which never led us to the point of omitting mutual criticism where our ideas differed."

Water for the Alice

A report prepared recently by the Division of Land Research and Regional Survey and the Bureau of Mineral Resources has shown how utilization of underground water resources in the Alice Springs area could increase land cultivation there more than one hundred times.

The report shows that 70,000 acre feet of water — enough to irrigate between 6,000 acres and 14,000 acres of the arid Alice Springs area — has been escaping underground each year.

It also shows that ground water storage in four basins near Alice Springs contains an estimated 4 million acre feet of water.

Preliminary assessment of the agricultural potential of the discovery of the water could lead to the establishment of several types of crops, bringing about significant import savings.

The total annual recharge of 70,000 acre feet of water should be adequate to irrigate 6,000 to 7,000 acres of perennial crops, 11,000 to 14,000 acres of summer crops such as cotton, or a smaller area of summer and winter crops.

The report said the cash crops worth considering for irrigated production in the region were:

- Date palms, cotton and similar crops which were particularly suitable for the arid environment, provided adequate irrigation was applied.
- Oil-yielding and similar crops, which produce relatively valuable primary commodities and by-products for which there was a local market.
- Speciality crops, such as fruit and vegetables, which could be produced "out of season" in the Alice Springs area and consequently command high prices on southern markets.

The report said the existence of a well-established date industry in California indicated that profitable date farming might be possible in the area.

Recent imports of dates to Australia and New Zealand amounted to 8,971,000 lb. and 4,192,000 lb. worth £232,000 and £160,000 respectively.

With average yields conservatively estimated at 3.5 tons an acre, 1,000 acres under date palms in full bearing would satisfy the Australian demand, while the New Zealand market could absorb the production from another 600 acres.

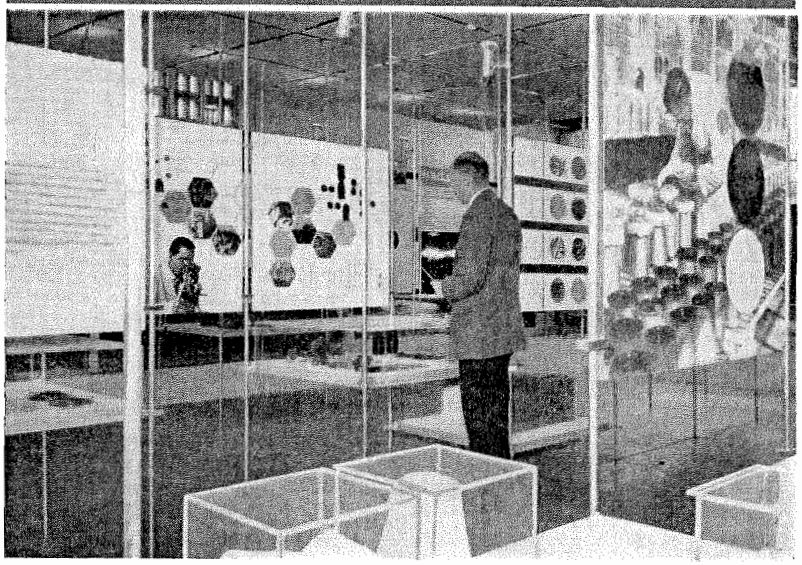
More saline waters could be used for the irrigation of these crops, which therefore would not prejudice the cultivation of salt-sensitive crops in areas where good water was available.

The report said cotton had not been tried in Central Australia, but the climatic conditions were similar to those found in areas such as California, Texas and Egypt, where very high cotton yields were attained under irrigation.

The report said the arid climate was also favourable for production of high quality lint, and for relatively cheap harvesting which could be spread over long periods without serious rain damage.

His Royal Highness, the Duke of Edinburgh, accompanied the Wilson family on a bird banding expedition at the southern end of Lake George during the visit of the royal couple to Canberra last month. In spite of a heavy official programme, the Duke arrived at Lake George at 4.45 a.m. and spent three hours with the Wilsons erecting mist nets and removing birds from the nets. Mrs. Wilson, who is a typist at the Canberra Regional Office, is shown above with the Duke.

EXHIBITION AT ADELAIDE



Visitors to the Royal Adelaide Exhibition last month saw a large exhibit depicting many of the activities of C.S.I.R.O.

The exhibit, which covers a floor area of about 750 square feet is divided into five sections.

They are sub-titled "History of C.S.I.R.O.", "C.S.I.R.O. and the Woolgrower", "C.S.I.R.O. and the Food Industry", "C.S.I.R.O. and the Manufacturer" and "C.S.I.R.O. and Minerals".

The graphic work and design of the exhibition were undertaken by Gallery A Design Group Pty. Ltd., a leading Melbourne firm of industrial designers.

The exhibit is portable and demountable. It can all be packed away into boxes and transported on a five ton truck.

Basically, it consists of a framework of aluminium tubular uprights, laid out in a 3 foot module. Standard 3 foot square panels are attached to the uprights.

The panels carry graphic display material, and physical exhibits can be mounted on 3 foot square tables attached to four uprights.

The exhibit has its own solid floor, its own ceiling (9 feet high) and its own lighting system.

The whole exhibition can be assembled or disassembled by half a dozen men in a day.

C.S.I.R.O. receives several requests to participate in exhibitions every year. It will now be possible to participate in some of these, either by putting in the whole exhibit, or one or more of the five sections.

It is intended to mount the exhibit in King's Hall, Parliament House, during the Budget Session in September.

The Section on "History" describes the problems encountered by the early settlers, and how the resources of science were eventually mobilized to deal with these problems. The treatment is entirely graphic, drawing heavily on old drawings and etchings.

The "Woolgrower" Section, naturally enough, deals with the work of the Wool Research Laboratories, but also brings in aspects of the work of the Divisions of Soils, Plant Industry, Wildlife Research, Entomology, Biochemistry and General Nutrition, Animal Health and Animal Physiology.

The "Food" Section deals with aspects of the work of the Divisions of Tropical Pastures, Food Preservation, Fisheries and Oceanography, Land Research and Regional Survey, Dairy Research, and the Horticultural Research Section.

The "Manufacturer" Section includes panels on the work of the Divisions of Building Research, Forest Products, the National Standards Laboratory, the Chemical Research Laboratories and the Engineering Section.

The section on "Minerals" features aspects of the work of the Divisions of Coal Research and Building Research, the Chemical Research Laboratories, and the Mineragraphic and Ore-Dressing Sections.

It is intended to keep the physical framework of the exhibition in circulation for several years. From time to time individual panels will be discarded and replaced, if they grow shabby or if they become out of date.

The whole display is intended to give the general public a representative, but not exhaustive, idea of the range of C.S.I.R.O. research.

Overseas Visits

Dr. H. J. Hoffman, of the Division of Animal Genetics, left recently on a round-the-world trip. He will visit experimental biology laboratories in Britain, Sweden and the United States.

Mr. D. J. Rochford, of the Division of Fisheries and Oceanography, made a short visit to Canada last month. He attended a meeting of the Special Committee on Oceanographic Research at Halifax, Nova Scotia.

Dr. A. D. Rovira, of the Division of Soils, made a short visit to the United States last month. He was invited to present a paper at an international symposium on "Biological Control of Soil-Borne Plant Pathogens" at the University of California, Berkeley.

Dr. D. Spencer, of the Division of Plant Industry, left last month for America. He will spend a year continuing his research on chloroplast structure and function with Dr. S. G. Wildman at the University of California, Los Angeles.

Mr. A. M. Thompson, of the Division of Applied Physics, left last month on a five weeks overseas visit. He will attend the Tenth Session of the Comite Consultatif d'Electricite at the National Physical Laboratory in England, and he hopes to visit a Russian metrology laboratory on the way home.

Dr. A. B. Wardrop, of the Division of Forest Products, left early in April to attend the Second Cabot Symposium on the "Formation and Structure of Xylem". This Symposium, which is under the auspices of Harvard University, will be attended by some twenty scientists invited from different countries. Following this meeting, Dr. Wardrop will visit laboratories in the United States, Canada, Japan and the Philippines.

APPOINTMENTS VACANT

The following vacancies for professional appointments are current:—

EXPERIMENTAL OFFICER (E.O.1/2)—Division of Chemical Physics. 581/26 (May 15).

EXPERIMENTAL OFFICER (CHEMIST) (E.O.1/2)—Division of Soils. 270/267 (May 15).

EXPERIMENTAL OFFICER (E.O.1/2)—Division of Applied Physics. 750/269 (May 17).

RESEARCH OFFICER (R.O.)—Division of Organic Chemistry. 606/41 (May 17).

EXPERIMENTAL OFFICER IN ELECTRONICS (E.O.1/2)—Division of Physics. 770/251 (May 24).

EXPERIMENTAL OFFICER—PLANT INTRODUCTION (E.O.1/2)—Division of Plant Industry. 130/543 (May 24).

ORGANIC CHEMIST (E.O.1/2)—Division of Forest Products. 290/664 (May 31).

RESEARCH OFFICER (R.O./S.R.O.)—Computing Research Section. 900/3 (May 31).

RESEARCH OFFICERS (R.O./S.R.O.)—Division of Chemical Engineering. 608/35 (June 14).

Mrs. Lucy Willings, who retired from the Division of Fisheries and Oceanography last month, has had a long association with C.S.I.R.O.

She joined C.S.I.R. (as it then was) in 1929 and worked as librarian with the Divisions of Economic Entomology and Plant Industry in Canberra until 1933.

She returned to the Organization toward the end of 1942 following the death of her husband on war service.

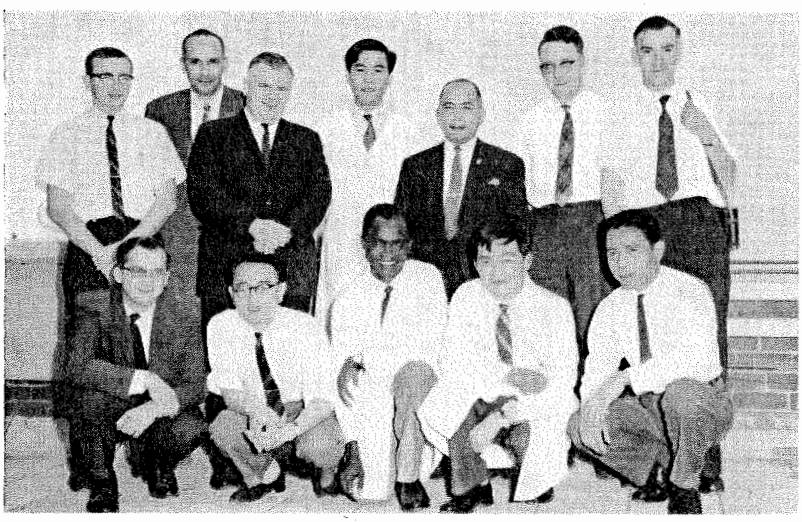
Her new post was at the Division of Fisheries, where she looked after the library.

Subsequently she assisted the Division's war-time activities with the Department of War Organization and Industry, and in 1946-47 she was seconded to the Department of Commerce and Agriculture to assist in the preparation and organization of a C.R.T.S. Fisheries School, at which she was a lecturer.

She was appointed Technical Secretary of the Division of Fisheries in 1948, and for the past few years she has been Editor of the Division's publications.

Those working in the Division now, and those who worked in the Division in the past, are much in Lucy's debt for the assistance she has given as a friend and as a colleague.

At a farewell dinner to Mrs. Willings at the Westalla Hotel, Cronulla, the guest of honour sat between Mr. C. S. Christian (left) and Mr. W. Ives (right).



Over the past ten or twelve years the Division of Forest Products has rarely been without at least one visitor from overseas. On one day recently the Division had eleven people from eight different countries there at once. From left, back row: R. Allen (U.S.A.), G. Sherbini (Egypt), A. P. Wymond (D.F.P. Information Officer), Dr. T. Sadoh (Japan), M. Monsalud (Philippines), R. Plumptre (Uganda), R. Hellawell (New Zealand). Front row: Professor N. Franz (U.S.A.), Dr. K. Isoi (Japan), F. Addo-Ashong (Ghana), K. Wong (Malaya), R. Cosin (Philippines).

NEW APPOINTEES

Mr. C. J. Dennett has been appointed to the position of Programmer in the Division of Physics. Since graduating B.Sc. from Sydney in 1961 he has been reading for a post-graduate diploma in numerical analysis and automatic computing.

Mr. R. W. Cawley has accepted a short-term fellowship in the Wheat Research Unit. A graduate of the University of Auckland, Mr. Cawley will be on leave from his post of Assistant Director of the New Zealand Wheat Research Institute.

Mr. J. P. Evenson has been appointed to the position of Cotton Agronomist with the Division of Land Research and Regional Survey, and will be stationed at Kununurra. A graduate of the University of Wales, he has had experience in cotton breeding at the Empire Cotton Growing Corporation's Station at Namulargе, Uganda. Since 1956 he has been on the staff of the Wellcome Research Laboratories in England.

Mr. D. A. Farrell has been appointed to the staff of the Soil Physics Section of the Division of Soils. After graduating B.C.E. in 1956 from Melbourne, Mr. Farrell worked as a civil engineer with the Department of Works. More recently, he has been working towards a Ph.D. degree at Melbourne.

Mr. W. B. Kennedy has been appointed to the staff of the Division of Building Research to take charge of the work on operational research which is soon to be started. An engineering graduate from the University of Melbourne, Mr. Kennedy has been on the staff of the Aeronautical Research Laboratories for over twenty years.

Mr. A. T. Proszynski has been appointed to a temporary vacancy on the staff of the Division of Forest Products. After arriving in Australia from Poland in 1958 he commenced a science course at Melbourne, and graduated B.Sc. last year.

Mr. A. McD. Richardson has joined the staff of the Division of Textile Industry. After graduating with honours in electrical engineering at Melbourne before the war, he was for ten years with A.W.A., lastly as engineer in charge of the television section. More recently he has been General Manager of the Australian Consumers' Association.

Dr. G. E. Cunningham has joined the staff of the Division of Food Preservation in the capacity of Editor. He has had extensive experience in leather research, and is a former Director of the now defunct Australian Leather Research Association. Dr. Cunningham previously acted as the Division's Editor for a few months in 1960-61.

Dr. G. E. CUNNINGHAM

Mr. P. F. Rolfe has joined the staff of the Division of Chemical Engineering, where he will work on water desalination. He recently completed his honours degree at Melbourne and has since been acting as senior demonstrator in the department of metallurgy.

Dr. B. J. Sweetman has been appointed to a fellowship tenable in the Division of Protein Chemistry. A graduate of the University of Otago, New Zealand, he will study the action of oxidising agents on amino acids, peptides and proteins.

Miss Patricia Walker has been appointed to the staff of the Virology Unit, Division of Animal Health. Since graduating from Melbourne in 1958 she has worked as a hospital bacteriologist in Adelaide and in London.

Miss PATRICIA WALKER

Mr. B. E. Wallbank, who recently graduated from Sydney, has been appointed to the staff of the Division of Entomology. He will apply physico-chemical techniques to problems in insect physiology and biochemistry.

Dr. J. F. K. Wilshire has been appointed to a Fellowship in the Division of Protein Chemistry. He previously held a similar post in the Division of Coal Research and for the last two years he has been on the staff of the Chemistry Department, University of Dublin.

Dr. H. Wuttke has been appointed to the staff of the Division of Plant Industry, and will be stationed at Mareeba. After graduating from Berlin in the early 'thirties, he worked for fourteen years as a plant breeder in Germany. He has been farming in Victoria since his arrival in Australia in 1951.

An open day at the Geelong laboratories of the Division of Textile Industry attracted a large crowd of local residents and students as well as a number of visitors from further afield.

Visitors were able to see something of the Division's work on overcoming problems in processing wool and wool textiles, and of the research which was being carried out on the development of new and better consumer products from wool.

During the afternoon, Professor J. B. Speakman, President of the British Textile Research Institute, spoke to a crowd of several hundred on developments in wool research.

He stressed the fundamental unity of science and pointed out, not only how many varied branches of science had contributed to wool research, but also how a number of discoveries made by wool scientists had proved to have had important implications for fields of science far removed from wool research.

Mr. S. Duim explains the operation of a carding machine to a visitor.

Printed by C.S.I.R.O., Melbourne.

051##1963

CORESEARCH

FOR CIRCULATION AMONG MEMBERS OF C.S.I.R.O. STAFF — NUMBER 51, MELBOURNE, JUNE 1963

HORTICULTURAL RESEARCH SECTION ... 3 JUN 1963 ... LIBRARY

Prime Minister Opens Geelong Laboratory

Australian wool research could mean economic life or death, the Prime Minister (Sir Robert Menzies) said after he officially opened new laboratories for the Division of Textile Industry, on 3rd May.

However, scientists only had to maintain present progress against synthetics, and manufacturers against scepticism and time wasted in adopting developments, to win the battle, he said.

Sir Robert Menzies was speaking to a representative audience of 800 persons, including Cabinet Ministers, members of parliament, members of the newly-formed Australian Wool Board, civic, pastoral and business leaders.

He said the battle to promote Australia's chief export could not be won only by scientists, however great their efficiency, for their work must be married to that of the manufacturer, the grazier and the consumer.

Many new ideas had and would come from C.S.I.R.O. and he appealed to all Australians to overcome scepticism of new developments.

Wool, when he was a boy, was taken for granted, the depredations of moths were a recognized evil and it was a divine dispensation that wool shrank.

Science had removed these disadvantages, and placed wool in a position to compete with the modern vigorous industry of synthetic fibres.

In far too many industries, too little attention was paid to scientific developments and their benefits — reduced costs, increased production, greater efficiency.

Sir Robert Menzies said he found pleasing the extent of co-operation between the scientists at Geelong and local woollen mills.

It was a happy day for him when he saw what could be done through co-operation in any productive field, he added.

Sir Robert was introduced by the Chairman (Sir Frederick White).

Sir Frederick recalled that when C.S.I.R.O. was asked to enter the wool textile research field, there were very few C.S.I.R.O. people who knew anything about it.

"But we had complete faith," he said, "that research, if properly conducted, would produce results.

"We knew that we could rely on the imagination and initiative of good scientists."

The Geelong laboratory had been highly productive of new ideas, said Sir Frederick. "I wish I had time to tell you," he said, "how far the work of this laboratory has been responsible for rising wool consumption in the United States."

"I am happy and satisfied," he added, "that there is now an effective International Wool Secretariat well equipped technically and promotion-wise to make good use of our ideas."

After Sir Robert opened the laboratory, he was thanked by Dr. M. Lipson, Chief of the Division of Textile Industry.

Dr. Lipson recalled an occasion twenty-eight years ago when an English firm applied for a patent which covered an invention made by C.S.I.R. C.S.I.R. decided to object to the granting of the patent and briefed Mr. R. G. Menzies to act as its counsel.

For some time, he said, the scientists and their counsel had difficulty in understanding one another. Eventually, Mr. Menzies took away Astbury's text book on wool and read it thoroughly. From then on there was no difficulty.

Mr. Menzies suggested that the performance of certain experiments would clear up the whole case.

"For two weeks," said Dr. Lipson, "Sir Robert Menzies was directing all the wool textile research going on in Australia, even though it was being performed by only one experimental officer."

"History records that C.S.I.R. won its case," he concluded.

After thanking Sir Robert, Dr. Lipson presented him with four lengths of tartan, three in variants of the Menzies tartan and one in the McGregor tartan, as Dame Pattie Menzies is a descendant of the clan McGregor.

Left: Dr. Lipson presented Sir Robert with four lengths of tartan fabric made at the Division.

Right: A view of the new Geelong laboratory.

Film Awards

Three films of the C.S.I.R.O. Film Unit received awards recently in the annual competition of the Australian Film Institute.

"The Rainmakers" received a special award for scientific photography in the educational category, **"Building on Research"** was given an honourable mention in the Public Relations category, and **"Fighting the Cattle Tick"** a Silver Award in the Teaching category for a lucid exposition of its subject.

The Institute reported a significant improvement in the overall quality of entries for the 1963 competition.

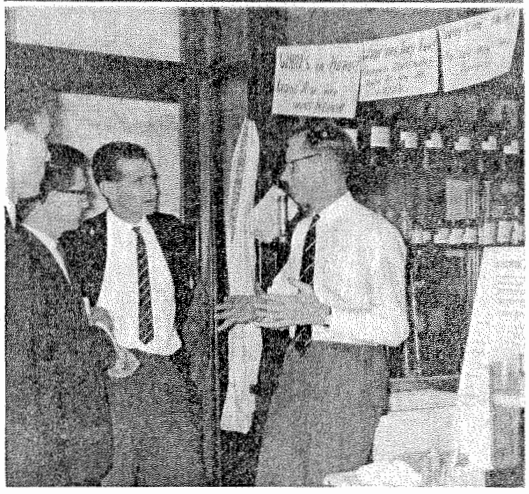
Of the total of one hundred and twenty-two films entered very few were technically inadequate and many displayed fine craftsmanship and creative imagination.

The major awards were restricted to films of such quality as would ensure their acceptance in an international competition.

It was felt that the films revealed considerable talent, which, given the opportunity, could earn Australia an international reputation in these fields.

The Australian film awards were instituted to stimulate and raise the standards of film production in Australia, and the quality of the 1963 entries suggested that the competition was beginning to achieve this aim.

N.S.L. OPEN DAYS



Dr. G. K. White demonstrating the way in which electrical conductivity of various materials changes when cooled.

Some 140 exhibits illustrating the activities of the Divisions of Physics and Applied Physics were on display last month at the two Open Days held at the National Standards Laboratory.

The two thousand people from science and industry who attended were able to see something of the work being done at the Laboratory to establish and maintain precise standards of measurement for the Commonwealth and to provide a centre where Australian scientific and industrial laboratories can have their reference-measuring instruments and standards checked to the highest accuracy.

Amongst the many exhibits on display were:

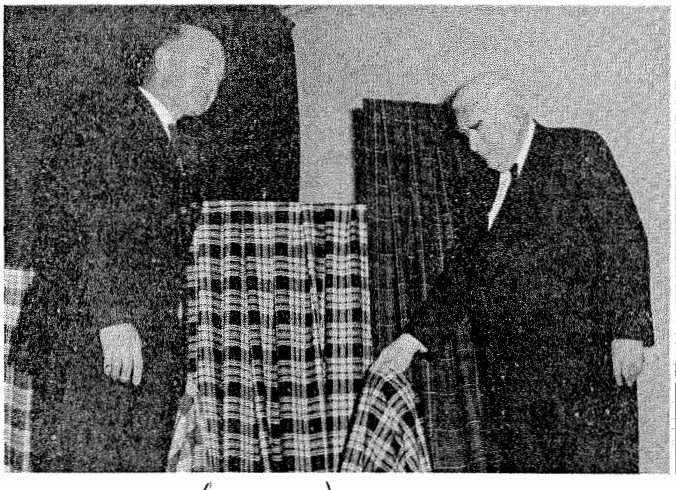
- Air-gauging equipment of a new type which makes possible continuous measurement of thickness of manufactured products, the measuring range being about twenty times as great as that of earlier instruments.
- A high precision hygrometer, now in commercial production, which has important advantages over previous instruments.
- A new photoelectric instrument for measuring temperatures above 2000°C with a precision of a few hundredths of a degree. (With the optical pyrometers conventionally used it is difficult to achieve a precision of 1°C.)
- An electric discharge lamp containing krypton gas which realizes in practice the new optical standard of length, the wave-length of the orange-red light it emits.
- A line standard interferometer and photoelectric microscope which allows the primary standard of length obtained from the krypton lamp to be transferred to mechanical line standards up to 1 m.

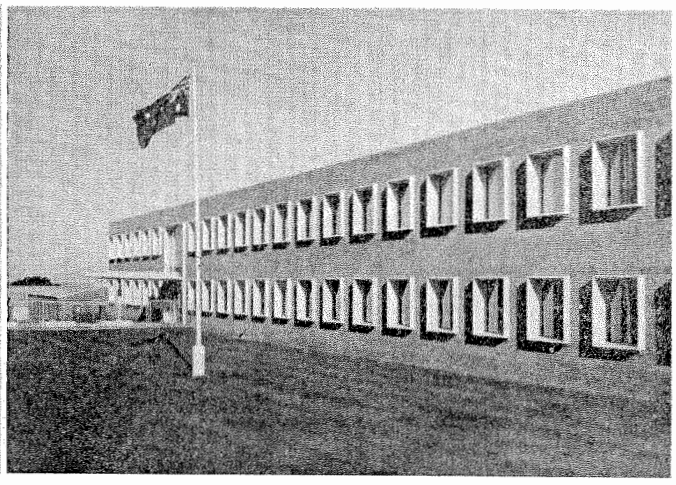
Various aspects of the Laboratory's fundamental research programme were also shown, including the measurement of solar magnetic fields and investigations of the connection between the atomic and molecular structure of solids and their mechanical and electrical properties.

A 600 megavolt transformer, installed recently for investigations on the mechanism of electrical breakdown and for other high voltage investigations, was also on display.

A special bus service enabled visitors to see the Production Engineering Research, Microwave, and Radio Frequency Sections of the Laboratory at Newtown.

The two Open Days were followed by an afternoon for science students from Sydney schools.





cf 607/085.3)CO S(COR)

Student Life in Germany

The Alexander von Humboldt scholarships offer excellent support for anyone wishing to do research in Germany for one or two years.

The scholarships are intended mainly for graduates entering upon careers in university research, and for members of independent research institutes.

There are no quotas for any one country, and the awards are made on the basis of world-wide competition. In the year 1961-62 about 300 scholarships were granted to graduates from 50 countries.

Japan supplied the largest number of students (approximately 80), and there were quite a few from Greece, Turkey, Yugoslavia and the United Arab Republic. Very few came from the European States. There were two from Austria, one each from England, France and Norway and three from Australia.

I have just spent a year working in the Division of Radiation Chemistry at the Max Planck Institute for Coal Research.

The Max Planck Institute is similar to C.S.I.R.O. in that it is an independent organization financed by the state. The institute, which is in Mülheim/Ruhr, is the old Kaiser Wilhelm Institute, where the Fischer-Tropsch process was worked out.

In Germany the outlook of such an institute reflects the interests of the man in charge. In 1943 Professor Ziegler became chief of the Max Planck Institute. As his main interests lie in the metal-organic field, the term "Institute for Coal Research" is now completely out of date.

General Organization of the Institute

Almost every scientist had a laboratory assistant working with him. The assistants were girls or boys of sixteen to eighteen years of age who were attending a technical college one day a week and who were given extra training at the Institute.

This meant that labour was relatively plentiful around the laboratory and there was a tendency to use it by buying technical grade chemicals and purifying them in the laboratory, or by synthesizing the more exotic compounds when it would have been possible to get them ready made. I was impressed by the ease with which they would tackle any organic synthesis.

In the Division of Radiation Chemistry there were about 16 students working for their Ph.D. degrees. This gave the place a bit of University atmosphere. There would be many lengthy scientific discussions and there was a study group meeting once a week (after hours) to hear a talk by one of the members on a specific subject. These talks were followed by general discussion.

The location of the Institute, close to the best residental area in Mülheim, had it advantages. All the employees were living close to their place of work. It might take them 10-20 minutes to walk to work or just a few minutes driving by car.

The institute helped members of the staff to find flats and frequently subsidized them in one form or another. I did not hear of anyone who lived in his own house.

The working hours were from 8 until 5 on weekdays and from 8 until 1 on Saturdays. The staff members went home to eat with their families, or else joined the bachelors in a restaurant.

Saturday morning work is rather unusual in Germany nowadays, but there was compensation for this in long holidays. The Institute closed down for four weeks in August and we had a fortnight off at Christmas and a fortnight at Easter.

Mr. K. Eppinger, of the Division of Physical Chemistry, recently spent a year in Germany on a Humboldt Scholarship. Here he sets down some impressions of graduate student life in Germany today.

During the year a number of distinguished visitors came to the Institute. Professor Emeleus gave a talk (in German) on organic fluorine compounds. Professor Noyes spoke on a photochemical problem, and Professor Clar made a lively attack on the quantum theory treatment of large condensed aromatic systems. Dr. Viehe of the European Research Associates presented an interesting review of his work on acetylenic compounds.

In many ways the Max Planck Institute in Mülheim/Ruhr was similar to our own Chemical Research Laboratories in Melbourne. Their library was inferior and no library service was provided. It was interesting to discover that all published papers include the name of the professor as co-author, and if he is not agreeable, a staff member cannot publish by himself.

The Alexander von Humboldt Scholarship

The main purpose of the Humboldt Scholarships is to offer the grantee a chance for advanced studies or research in his field of specialization.

A reasonable knowledge of the German language is a great advantage for an applicant. From my experience English would have been good enough for work at the Institute, because all the scientists could speak it to some extent, but everyday life would have been fairly difficult.

The Scholarships provide return fares to Germany and an adequate living allowance of 800 DM per month for a single person and an extra 200 DM for a married man accompanied by his wife. (A German graduate with a Ph.D. will get a starting salary around 1000 DM per month. Ph.D. students manage to live on 300 to 500 DM per month.)

The scholarship includes a bus trip which covers the whole of Germany in three weeks. This provides a wonderful opportunity to see many places of interest and beauty.

PROGRESS AT TOWNSVILLE

Powerful TD 18 bulldozers have been transforming a scrubby wilderness at Woodstock, the Division of Tropical Pastures' new research station near Townsville, to clear the way for a wide range of local and introduced pasture grasses and legumes which will undergo rigorous testing there.

Progress has been rapid in the six months since the Division acquired the 7,000 acre grazing property at Woodstock.

A herd of Droughtmaster stud cattle has been purchased, fencing and water facilities are expanding daily and modern cattle yards are well past the planning stage.

The Droughtmasters will be used to measure the palatability and productivity of both natural and experimental pastures.

Experiments to determine the extent of various soil deficiences are well under way.

The main body of scientists for the Townsville Pastoral Research Laboratory is expected to arrive shortly.

Their arrival will help to cover a wide range of expanding and changing fields of research.

These include agrostology, plant introduction, plant chemistry, plant nutrition, soil survey, soil chemistry, animal nutrition, animal health and plant ecology.

The staff will occupy temporary premises in Townsville pending the building of new laboratories on the bank of Ross River.

The Officer-in-Charge of the Laboratory, Mr. Les Edye, said that it was intended to establish regional centres for research in co-operation with private graziers.

It might be years before results would be available, he said, as C.S.I.R.O. was seeking long term solutions to pasture problems.

However, close liaison with the grazing industry would be maintained.

Top of page: Mr. Joe Ritson, Officer-in-Charge of the Division of Tropical Pastures' new field station at Woodstock, near Townsville, examines a dense stand of Townsville lucerne.

Above: Driver, Darryl Millard, uses a TD 18 bulldozer to clear land for experimental pastures at Woodstock.

Book of the Year

Mary Quick, taxonomic illustrator in the Division of Entomology, has just received a 'Book of the Year' award for "Letters to Scotland, 1860", which she illustrated, printed and published at her own press — the Juniper Press — before joining the Division. These awards are made by the Australian Book Publishers' Association for the twenty-eight best-designed Australian books of 1961-62.

Academy Election

Dr. J. H. Piddington, of the Division of Radiophysics, has been elected to a Fellowship of the Australian Academy of Science in recognition of his "distinguished contributions to radio astronomy and astrophysics."

Food Convention

Five C.S.I.R.O. research officers, four from Food Preservation and one from Dairy Research, will address the Thirteenth Annual Convention of the Institute of Food Technologists, which is being held at Mildura, Victoria, from June 11-14, 1963.

The opening address will be delivered by Mr. J. F. Kefford (Food Preservation), who will speak on "Food Science and Technology — the International Outlook".

The staff of C.S.I.R.O. will figure prominently in a symposium on "Microbial Selection and Adaptation in Foods". The chairman will be the Assistant Chief of the Division of Food Preservation, Dr. W. J. Scott.

Dr. J. H. B. Christian (Food Preservation) will speak on cured meats, Dr. F. Grau (Food Preservation) on chilled meats, and Miss B. Keogh (Dairy Research) on dairy products.

APPOINTMENTS VACANT

The following vacancies for professional appointments are current:—

FELLOWSHIP IN SURFACE CHEMISTRY (R.O./S.R.O.) — Division of Tribophysics, 370/148 (June 7).
ENTOMOLOGIST — FRUIT FLY INVESTIGATIONS (R.O.) — Division of Entomology, 180/188 (June 14).
EXPERIMENTAL OFFICER (E.O. 1/2) — Division of Applied Mineralogy, 604/21 (June 14).
PHYSICAL CHEMIST or CHEMICAL PHYSICIST (R.O./S.R.O.) — Division of Coal Research, 480/412 (June 14).
RESEARCH CHEMIST (R.O./S.R.O.) — Division of Land Research and Regional Survey, 623/23 (June 14).
RESEARCH OFFICERS (R.O./S.R.O.) — Division of Chemical Engineering, 608/35 (June 14).
RESEARCH OFFICER FOR TICK FEVER INVESTIGATIONS (R.O./S.R.O.) — Division of Animal Health, 204/80 (July 5).

Mutsandra Gets A Well

The small Indian village of Mutsandra is to get its first well of water for drinking and irrigation following a meeting in Mildura organized by Pat Lawrence, Librarian of the Horticultural Research Section, Merbein.

Pat learnt of the plight of people in India after speaking to an Asian visitor, Mr. Divakar Chandran.

Pat then learnt of Community Aid Abroad (C.A.A.) which was founded ten years ago by Father Tucker of the Brotherhood of St. Laurence, an Anglican organization in Melbourne devoted to assisting the under-privileged.

The aims of C.A.A. are:

- to encourage the Government and people in Australia to greater efforts in contributing to the economic and social progress of the developing countries of Africa and Asia.
- to provide opportunities for every Australian to personally participate in providing aid to developing countries.
- to help relieve world tension and to promote peaceful relations between nations of the world by helping improve living standards in the economically under-developed countries.

Pat contacted Mr. David Scott, the Director of C.A.A., who addressed the meeting in Mildura which she had organized.

As a result of the meeting, a local C.A.A. branch was formed which will try to raise £1,000 to provide the well which is so desperately needed by the villagers of Mutsandra.

"Our aim is to get on first name terms with the people of Mutsandra," said Pat.

So far the Campaign's overseas aid programme has been confined to India. Local C.A.A. groups formed in Australia are linked to particular projects in India and the group helps the projects in their efforts to obtain self-sufficiency.

C.A.A. does not send food except for small quantities of powdered milk to meet special needs.

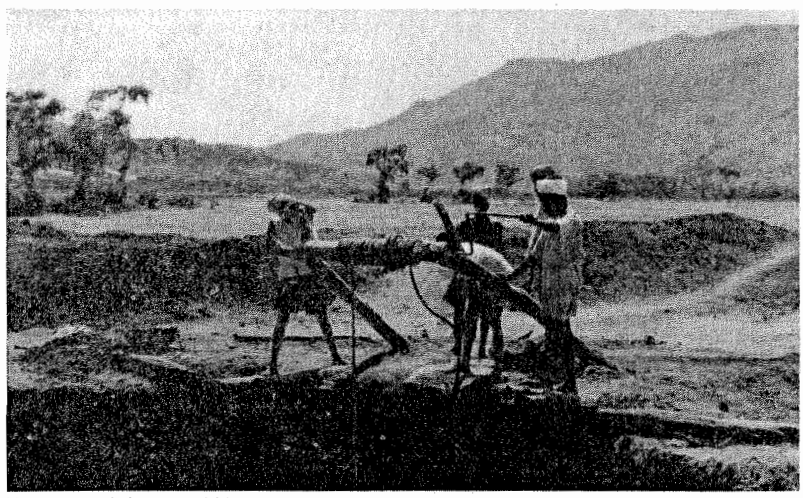
The basic aim is to help people in India and other countries to increase agricultural production, raise living standards, improve health standards, and extend education through their own efforts.

So far a total of more than £21,000 has been raised for projects in India.

Some of the projects aided include:

- a hospital in an area of great poverty at the India-Nepal frontier was provided with £1,500 to bring water to it and to provide vitamins for under-nourished children.
- an impoverished slum area in Poona where 300 families are living in shacks and hovels was given £200 to provide a village worker to help raise living standards, assist with health and educational work, and teach handcrafts to provide an income for residents.
- a centre for Tibetan refugees near Delhi was given £200 for a pump and pipes to irrigate ten acres of land. The people are now self-sufficient in vegetables, and market their vegetables and flowers.
- an educational establishment in Gujrat consisting of a University College, primary and secondary school and agricultural training centre for nearby villages was given £400 to build an experimental cow dung gas plant and to sink a well for irrigation purposes. £3,000 was also provided to build a hospital and class room/laboratory.

Anyone interested in forming a C.A.A. group should contact Mr. D. Scott, Director, C.A.A., 67 Brunswick Street, Fitzroy, Victoria.



Money raised by the Mildura Branch of C.A.A. will help the villagers of Mutsandra to deepen and line their well.

CAR BURIED IN FREAK ACCIDENT

Randolph Winks, of the Division of Animal Health's Veterinary Parasitology Laboratory at Yeerongpilly, Brisbane, had an unnerving experience recently when two tons of sawdust crushed the station waggon in which he and driver, Frank Shiel, were travelling.

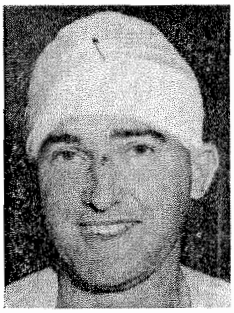
The accident happened when a truck loaded with six tons of sawdust swerved to avoid a collision with another car. Two tons of the load tipped from the truck burying the station sedan completely.

The weight of the load pulled the truck over on top of the car. The roof was crushed, pinning Winks and Shiel to their seats.

Luckily, a tarpaulin underneath the sawdust held so that bystanders were able to get them out. "Only the good die young," said Winks as he was helped out.

Winks' head was jammed between the flattened roof and the top of the seat for ten minutes.

"If my head hadn't been there, the hood certainly would



Mr. R. WINKS

have caved right in, and crushed me against the seat," he said.

"I don't want to go any closer to death than that.

"I heard people outside telling me not to move, but after about 10 minutes, I could hardly breathe.

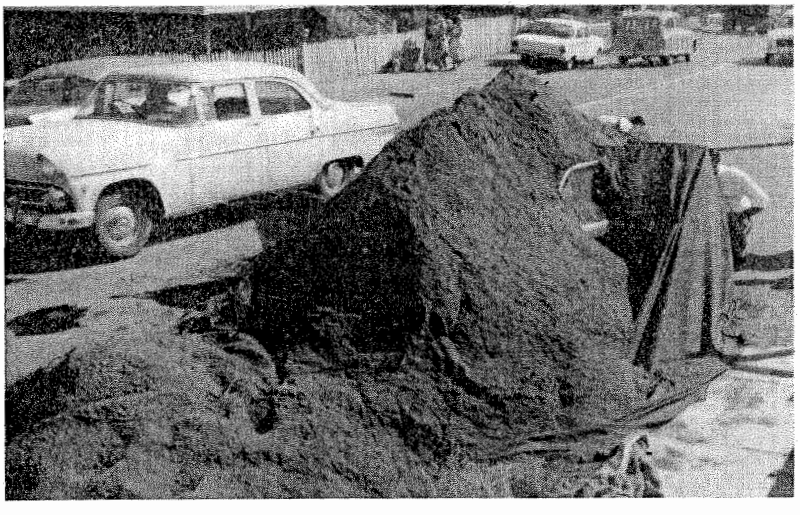
"I was able to force up the roof a little with my hands, wriggle out from behind the steering wheel, and ease my head out.

"Then I climbed through the door on the passenger's side."

Winks had a scalp laceration and Shiel shock.

They were taken to Princess Alexandra Hospital for treatment, and allowed to go home.

A Brisbane City Council crane lifted the truck from the crushed station sedan. Only part of the grille of the station sedan showed from beneath the heap of sawdust.



DEATH OF DR. K. F. BAKER

Dr. Kingsley F. Baker suddenly became ill on the evening of 30th April and was admitted to Sydney Hospital, where he died in the early hours of the following morning.

His sudden death, at the early age of 42, is a tragic loss to the Division of Coal Research, in which he served with great ability as Technical Secretary for some eight years.

Kingsley Baker was educated at Brisbane Boys' College and at the University of Queensland, where he graduated in chemistry in 1942. He was awarded the degree of Master of Applied Science in 1946.

From 1947 to 1949 he worked under Professor H. E. Fiery-David in Zürich and was awarded the D.Sc.Tech. degree for work on benzthiazole derivatives.

Before returning to Australia to take up a position as Research Chemist with Timbrol Ltd. (now Union Carbide Australia Ltd.) he was that firm's technical representative in Europe, engaged in re-establishing with chemical firms contacts interrupted during World War II.

He joined C.S.I.R.O. in September 1955, and his administrative ability, thoroughness and scrupulous attention to detail, coupled with wide theoretical and practical scientific knowledge, proved valuable during a period of rapid development in the Coal Research Section (as it then was).

His duties touched upon every aspect of the day-to-day activities of the Division, but he was particularly concerned with the provision of technical services, the planning and erection of new laboratories, and with the field work for the Division's Chemical and Physical Survey of National Coal Resources; he took a leading part in drafting the comprehensive and detailed reports arising from this survey.

He served with outstanding success as Chairman of the Committee responsible for compiling the C.S.I.R.O. Safety Handbook. Last year he was Secretary of the Third Conference of the British Commonwealth Committee on Fuel Research.

He had a wide range of interests and was an entertaining raconteur, particularly on social occasions when his sense of humour was greatly in evidence.

He leaves a widow and two daughters of school age.

TECHNICAL ASSOCIATION NEWS

Election Results

Central Council Elections

Federal President: Mr. E. Murray (Coal Research)
General Secretary: Mr. W. J. Menzies (Animal Physiology)
General Treasurer: Miss Eve Ahearn (Animal Genetics)
Publicity Officer: Mr. H. F. Burne (Physics)

Victorian Elections

Chairman: Mr. H. F. Heath (Forest Products)
Secretary: Mr. F. Daniels (Forest Products)
Treasurer: Mr. R. F. Thompson (Forest Products)

Other results will be published later.

Council-in-Person Meeting

On April 27th and 28th interstate delegates attended a Council meeting in Melbourne and some points of general interest are given below.

Work-value Sub-committee

Survey returns have greatly exceeded expectations. Several divisions have returned 100% of their survey forms and the overall average will exceed 75%. The results are now being carefully studied.

Adults Study Fees

Branches must decide if the Association should press for repayment of adults fees, or alternatively, for accelerated promotion at the age of 21 for partial completion of approved courses. Accelerated promotion does occur to a limited extent at present.

Some members feel that the cumulative benefits of accelerated promotion could out-weight fee refunds. This is so despite the high fees payable in some university courses.

Association Policy

Branches will be asked to submit items of general policy, for discussion at the next Council meeting. Future Council-in-Person meetings will be held at least twice yearly and in future all Council meetings will be tape-recorded.

Overseas Visits

Dr. J. D. Blackwood, of the Division of Chemical Engineering, is at present in Great Britain visiting research institutions working in the fields of gasification of carbon, reaction kinetics, and fluid mechanics and mass transfer. Dr. Blackwood will also visit centres in the United States and will attend the Sixth Biennial Carbon Conference at Pittsburgh later this month.

Dr. R. A. Durie, of the Division of Coal Research, left last month for Great Britain, Europe and North America where he will visit laboratories working on the chemical and physical behaviour of the inorganic constituents of coal at high temperature. He will also attend the Fifth International Coal Science Conference, the Sixth Biennial Carbon Conference, and the Conference on Molecular Spectroscopy and Molecular Structure.

Mr. D. A. Forss, of the Division of Dairy Research, left Australia recently for America where he has been awarded a Research Associateship at the Quartermaster Research and Engineering Centre at Natick, Massachusetts. He will travel to America via the U.K., Netherlands, France, Switzerland and Italy where he will visit various research establishments.

Mr. R. J. Jones, of the Division of Tropical Pastures, left last month for Kenya. With Land Rover and native assistant he will spend several weeks in the bush collecting plant specimens, especially ecotypes of the grass *Setaria.*

Mr. R. W. Kerr, of the Division of Entomology, left Australia last month for North America, Great Britain and Europe where he will visit research centres concerned with problems of insecticide resistance. He will also attend the Fifth International Pesticides Congress in London next July.

Dr. G. N. Lance, Mr. T. Pearcy and **Dr. G. W. Hill,** of the Computing Research Section, have recently returned from a short visit to the United States and Britain. They have been visiting a number of firms which supply electronic computer equipment.

Dr. M. F. R. Mulcahy, of the Division of Coal Research, is at present visiting research centres in Great Britain, Europe, U.S.S.R. and America. He is interested in the measurement of the free radicals involved in the burning and gasification of coal. Dr. Mulcahy will attend the International Conference on the Mechanism of Corrosion by Fuel Impurities and the Fifth International Conference on Coal Science.

Dr. M. J. T. Norman, of the Division of Land Research and Regional Survey, will arrive in London later this month after spending some five weeks in North America. He is on a five months' visit to the U.S.A., U.K., Africa and South Africa to study the latest developments in the field of pastures and fodder crops. He will also visit F.A.O. in Rome to discuss regional research in underdeveloped areas.

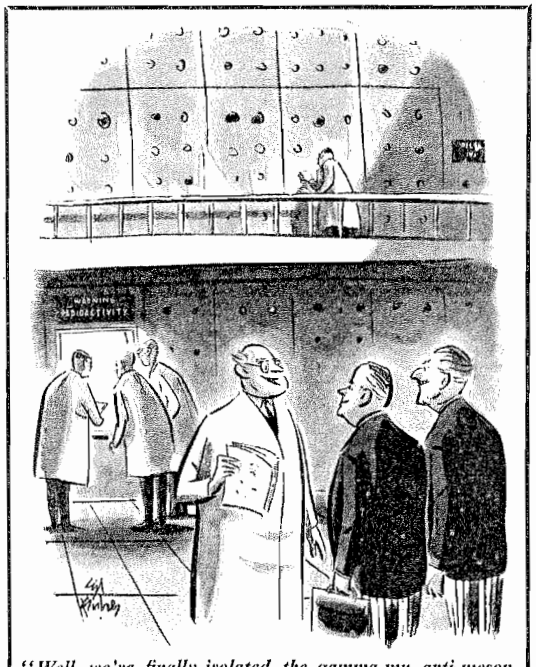
Sir Frederick White returned recently from a two-week visit to Japan as guest of the Science and Technics Agency. While in Japan, Sir Frederick visited industrial research centres and the International Wool Secretariat Office at Yokohama.

Mr. L. T. F. Woolcock, of the Division of Entomology, has been posted to London for three years. He will work with Mr. F. Wilson, who is investigating European parasites of the Sirex wasp.

NEW BOOKS

From the Jacaranda Press, Brisbane, have come two small books with a popular appeal, written by research officers of the Division of Entomology.

"Insects of Australia", by Edgar Riek, with colour and half-tone illustrations by Ninon Geier, and "Australian Moths" by I. F. B. Common, illustrated with photographs by Ederic Slater of the Division of Wildlife Research and with Mr. Common's own colour and line drawings.



"Well, we've finally isolated the gamma-mu anti-meson, and there don't seem to be — thank God! — any practical applications"

Copyright London Punch

APPOINTMENTS TO STAFF

Mr. R. A. Buchanan has been appointed to the staff of the Division of Dairy Research. A graduate of Massey College in New Zealand, he was previously with the Victorian Department of Agriculture and the Rochester Co-operative Dairy Co. In 1959 he spent a year at Iowa State University, under a Rotary Foundation Fellowship.

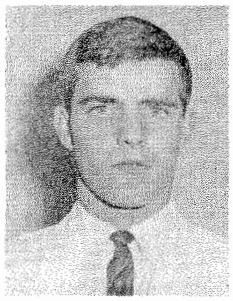
Mr. R. A. BUCHANAN

Mr. F. J. Moyle, a science graduate from the University of Adelaide, has been appointed to the Division of Mineral Chemistry to work in the newly formed Process Development Group. He will be responsible for the analytical work of the Group, and for the development of the Croft ilmenite process. Mr. Moyle was previously with the South Australian Mines Department and the Australian Mineral Development Laboratories.

Mr. T. Kamiko, Officer in Charge of the Weather Map Processing Sub-Section of the Japanese Meteorological Agency's Forecast Department, has been awarded a Fellowship under the Australian International Award Scheme to work with the Division of Meteorological Physics for twelve months on cold fronts.

Mr. E. J. Sparke, a rural science graduate from New England, has joined the staff of the Division of Biochemistry and General Nutrition. He will act as resident field officer at "Yulgilbar", a property in northern New South Wales. The Divisions of Biochemistry and General Nutrition and Animal Physiology are carrying out experiments at "Yulgilbar" on the growth, productivity and reproduction of cattle.

Mr. R. G. Ganly has joined the staff of the Division of Textile Industry. Since taking out his diploma at the Gordon Institute of Technology, Geelong, in 1960, he has worked as a chemist with Peerless Silk Mills in Melbourne.



Mr. R. G. GANLY

Mr. M. J. Goodspeed, a graduate of Aberdeen University, has been appointed to the staff of the Division of Land Research and Regional Survey. Since coming to Australia in 1955 he has been with the Bureau of Mineral Resources and the Department of Interior. During this period he spent a year in Antarctica, where he was engaged on measurements of ice-cap thickness.

Miss S. M. Green is at present en route to Australia to take up a three year appointment with the Division of Mathematical Statistics in Canberra. Since obtaining an honours degree and a diploma in statistics from Oxford, she has been on the staff of the Grassland Research Institute at Hurley, Berks.

Dr. M. Goto of the Department of Geology and Mineralogy at Hokkaido University, Japan, has been awarded a post-doctorate fellowship to work with the Division of Building Research on the growth and study of gypsum crystals as part of the Division's investigations on plaster.

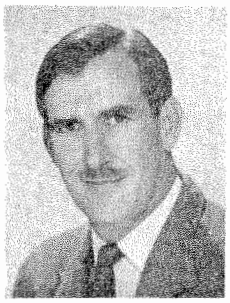
Dr. M. GOTO

Mr. R. J. Hine has joined the staff of the Division of Textile Industry. After completing his diploma at the Gordon Institute of Technology, Geelong, he joined the Phosphate Co-operative Company of Australia Ltd., and became the Company's Chief Chemist. Mr. Hine represented Australia in cycling at the Commonwealth Games in Perth.

Mr. R. J. HINE

Mr. D. A. Hedges has joined the staff of the Division of Animal Physiology and will be stationed at Armidale. Since graduating B.Agr.Sc. from Sydney in 1959, he has been with the Northern Territory Administration, latterly as the officer-in-charge of animal husbandry work at the Beatrice Hill Research Station.

Dr. R. H. Wharton has joined the staff of the Division of Entomology and will be stationed at the Veterinary Parasitology Laboratory,



Dr. R. H. WHARTON

Queensland. A graduate of the University of Sydney, he has been for the past fifteen years on the staff of the Institute for Medical Research at Kuala Lumpur, Malaya.

Two Fulbright Scholars

Dr. R. G. Cassens, a graduate in animal husbandry and biochemistry from the University of Wisconsin, is working in the laboratories of the Division of Food Preservation at North Ryde.

Dr. Cassens, who is here as a Fulbright Scholar, arrived with his wife in Sydney on February 27.

He plans to spend about eight months at North Ryde, and about four months at the Division's Meat Research Laboratory at Cannon Hill, Queensland.

Dr. Cassens is interested in the cause of the exudate from frozen and thawed beef muscle, known as "drip", which is a serious problem in the marketing of frozen beef.

Dr. R. G. CASSENS

At North Ryde Dr. Cassens is investigating the relation of the rate of disappearance of adenosine triphosphate to the post-mortem temperature in muscle. At Cannon Hill he proposes to study the depletion of glycogen in different muscles of the same animal during stress.

Another Fulbright Scholar, Professor N. Higinbotham, head of the Department of Botany in Washington State University, arrived in Australia with his wife on February 28, 1963, and worked in the Plant Physiology Unit of the Division of Food Preservation for three months.

Prof. N. HIGINBOTHAM

He is spending the next six months in the Botany Department, University of Adelaide, with Professor R. N. Robertson.

Dr. Higinbotham and his coworkers made some of the first measurements of the intracellular electrical potential of cells of higher plants. In Australia he will collaborate with others working in this field.

Printed by C.S.I.R.O., Melbourne.

052##1963

AGRICULTURAL RESEARCH C.S.I.R.O. 1963 LIBRARY

CORESEARCH

FOR CIRCULATION AMONG MEMBERS OF C.S.I.R.O. STAFF — NUMBER 52, MELBOURNE, JULY 1963

New Chief for Plant Industry

Dr. J. E. Falk has been appointed Chief of the Division of Plant Industry. He succeeds Dr. O. H. Frankel, F.R.S., who was appointed to the Executive last year.

The Division of Plant Industry, which is the largest Division in C.S.I.R.O., has its headquarters in Canberra and laboratories and field stations in Western Australia, Tasmania, New South Wales and Queensland.

It is the oldest of the C.S.I.R.O. Divisions and is one of the largest plant research centres in the world.

The Division has a staff of nearly 500 and an annual budget close to £1,000,000.

Its work encompasses genetics and plant breeding, plant introduction, microbiology, general chemistry, plant nutrition, plant biochemistry and biophysics, ecology, agricultural physics and agronomy.

Dr. Falk, who is aged 45, graduated from the University of Sydney in 1942. In 1949 he won a Nuffield Fellowship which enabled him to work at University College Hospital Medical School in London. He was awarded the Ph.D. degree of the University of London in 1951. In 1953 he was awarded the Foulerton Research Fellowship of the Royal Society.

Dr. Falk joined Plant Industry in 1955 as leader of its biochemistry team. His outstanding research achievements have been recognized by his election in 1961 to a Fellowship of the Australian Academy of Science.

Dr. Falk will be assisted by four Assistant Chiefs: Dr. J. B. Langridge, Dr. R. M. Moore, Dr. F. H. W. Morley, and Dr. J. R. Philip.

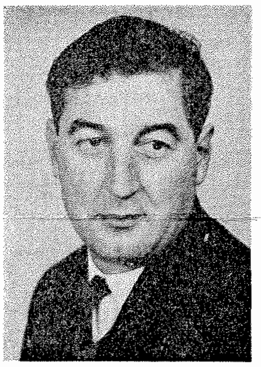
Dr. Langridge graduated M.Sc. from Auckland with first class honours in 1951. He came to Australia under a C.S.I.R.O. studentship to work for his Ph.D. at the University of Adelaide. After graduation in 1954 he joined C.S.I.R.O. where he established an outstanding record for his research in genetics.

Dr. Moore graduated with honours from Sydney in 1937 and joined C.S.I.R.O. in the following year. His notable career in plant ecology has been recognized by the award of a Commonwealth Fund Fellowship and both master's and doctor's degrees in agricultural science from the University of Sydney. He is a past president of the Australian Institute of Agricultural Science.

Dr. Morley originally took a diploma course in agriculture at Hawkesbury College but went on to graduate in veterinary science from Sydney. He was subsequently awarded a Ph.D. degree by Iowa State College. Dr. Morley, who joined C.S.I.R.O. in 1954, has done outstanding work in the breeding of subterranean clover. He is the leader of the Division's grassland agronomy group.

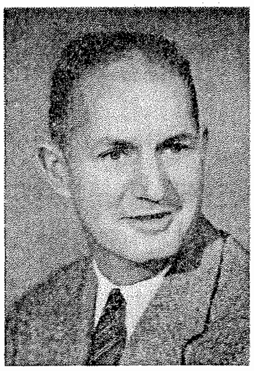
Dr. Philip graduated in civil engineering from Melbourne in 1946 and joined C.S.I.R.O. in 1951. He has been a pioneer in the application of physical and mathematical methods to soil and plant problems. He has held a research fellowship at the California Institute of Technology and a Nuffield Fellowship at Cambridge. He was joint winner of the American Geophysical Union's Horton Award in 1958 and was awarded the D.Sc. degree by the Melbourne University in 1960.

Dr. J. E. FALK

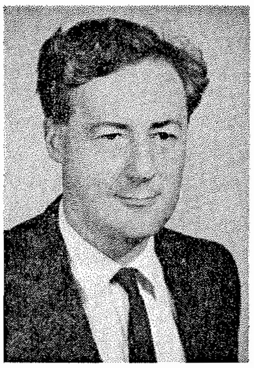


Dr. J. B. LANGRIDGE

Dr. R. M. MOORE



Dr. F. W. H. MORLEY



Dr. J. R. PHILIP

DR. NOBLE RETIRES

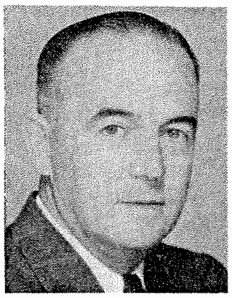
Dr. N. S. Noble retired recently as a result of ill health after being Editor of the Organization's scientific journals and other scientific publications for some sixteen years.

Dr. Noble graduated in Agricultural Science with first class honours at the University of Sydney in 1928 and was appointed assistant entomologist with the New South Wales Department of Agriculture.

In 1929 he was awarded a Walter and Eliza Hall Agricultural Research Fellowship. He studied advanced entomology and carried out research at the Imperial College of Science, University of London, from 1929-30, and at the University of California from 1930-31. He was awarded the Diploma of the Imperial College (D.I.C.) in 1932 and an M.Sc. (California) in 1931.

He then returned to the Entomological Branch of the Department of Agriculture and in 1938 was admitted to the degree of Doctor in Agricultural Science by the University of Sydney.

In 1941 he became Secretary of the Linnean Society of New South Wales where he edited the proceedings of the Society and was responsible for its general direction.



Dr. N. S. NOBLE

In 1947 he was appointed to help establish a series of national scientific journals which C.S.I.R. proposed publishing in collaboration with other scientific bodies.

Under Dr. Noble's direction the C.S.I.R.O. journals were developed to their present high standard. In consultation with the other members of the Board of Standards and the Editing Advisory Committees of the individual journals, he has produced scientific journals of which C.S.I.R.O. and Australia can well be proud.

Obituary

On Tuesday, 21st May, 1963, the death occurred at the Prince Henry Hospital, Melbourne, of Mr. Harold Morton.

Harold joined C.S.I.R.O. in 1940 and was associated with the Orders and Transport Section at Head Office during the whole of his career.

He specialized in Customs and Shipping work and was well known throughout the Organization.

His likeable personality assisted greatly with the Customs formalities so essential to the well being of new staff arrivals and officers returning from official visits overseas.

A very large gathering representative of all Melbourne Divisions and Sections attended his funeral at the Burwood Cemetery on Thursday, 23rd May.

Harold will be sadly missed by his many friends.

Honours

C.B.E. for Dr. Wark

Dr. I. W. Wark, Member of the Executive, was honoured by the Queen in her recent Birthday Honours list. Dr. Wark was created a Commander of the British Empire (C.B.E.) for outstanding service to science.

Doctorates

Mr. D. E. Angus of the Division of Meteorological Physics has now qualified for the Ph.D. degree of the University of California. His thesis was entitled "The influence of meteorology and soil factors on the rate of evapotranspiration of a crop".

Mr. K. E. Murray of the Division of Food Preservation has been awarded the degree of D.Sc. by the University of Western Australia for his research on the chemistry of waxes. This work was carried out between 1948 and 1960 in the Organic Chemistry Section, now the Division of Organic Chemistry, and dealt with waxes derived from wool, the preen gland of geese, the wax palm of Brazil, and sugar cane.

Professorship

Dr. E. J. Williams of the Division of Mathematical Statistics has been appointed Professor of Statistics at the University of Melbourne and will take up his new post next January. Dr. Williams will succeed Professor H. Beltz who retired earlier this year.

APPOINTMENTS VACANT

The following vacancies for professional appointments are current:

POST-DOCTORAL FELLOWSHIP IN MICROBIOLOGY—Division of Food Preservation. 300/366 (July 5).

RESEARCH OFFICER FOR TICK FEVER INVESTIGATIONS (R.O./S.R.O.)—Division of Animal Health. 204/80 (July 5).

SCIENTIFIC SERVICES OFFICER (S.S.O.2/3)—Industrial Research Liaison Section. 111/11 (July 5).

MICROWAVE CHEMIST (E.O.1/2)—Division of Mineral Chemistry. 601/19 (July 7).

ANALYTICAL CHEMIST (E.O.1/2)—Division of Animal Physiology. 245/276 (July 12).

EXPERIMENTAL OFFICER (E.O.1/2)—Division of Chemical Engineering. 608/33 (July 15).

EXPERIMENTAL OFFICER (E.O.2/3)—Division of Animal Genetics. 682/19 (July 31).

PLANT BREEDER (S.R.O./P.R.O.)—Horticultural Research Section. 490/122 (July 31).

PLANT PHYSIOLOGIST (S.R.O./P.R.O.)—Division of Food Preservation. 300/368 (August 9).

VETERINARY BACTERIOLOGIST (R.O./S.R.O.)—Division of Animal Health, McMaster Laboratory, Sydney. 202/220 (August 9).

EXPERIMENTAL OFFICER (E.O.1/2)—Division of Textile Industry. 464/306 (August 16).

VETERINARY PARASITOLOGIST (E.O.2/3)—Division of Animal Health. 201/190 (August 16).

~~P f 607/085. 3~~ ~~Co~~ 5 (COR)

CONTRACTS LET FOR COMPUTERS

A contract worth about £1,500,000 has been placed with Control Data Corporation of Minneapolis, Minnesota, U.S.A., for electronic computing equipment for C.S.I.R.O.

Contracts for associated equipment have been placed with International Business Machines (Australia) Pty. Ltd. and with Amalgamated Wireless (Australasia) Ltd.

In May last year, the Minister-in-Charge of C.S.I.R.O., Senator Gorton, announced a national scheme for establishing a high performance central computer and a number of satellites for the scientific computing requirements of C.S.I.R.O., universities and Commonwealth bodies. The basis of this national network was to be established in C.S.I.R.O. and was to consist of a central computer and four subsidiary computers.

Control Data Corporation is to supply a CDC 3600 computer for the new C.S.I.R.O. Scientific Computing Laboratory now being built at Canberra. CDC will also supply four subsidiary computers to be installed in C.S.I.R.O. research laboratories at Melbourne, Adelaide, Canberra and Sydney.

Punched cards and punched paper tape data preparation equipment, as specified for the network, is to be supplied by I.B.M. (Australia) Pty. Ltd., and A.W.A. Ltd., respectively.

The CDC 3600 with its supporting staff will be housed in a specially designed building being constructed on the slopes of Black Mountain, Canberra, near other C.S.I.R.O. research laboratories and the Australian National University. The building is due to be completed by next April and delivery of the computers is expected shortly afterwards.

The CDC 3600 is considered one of the most advanced electronic computers in the world and can perform one million operations a second or add 15 digit numbers at the rate of nearly half a million a second.

The equipment ordered for the central computer at Canberra will hold over one and a half million "bits" of information in 32,768 high-speed storage locations and an additional 230 million "bits" on a stack of magnetic discs.

The system has eight magnetic tape transports, facilities for reading and producing information on punched card and paper tape, and equipment for high-speed printing and graphical display of results. It will substantially increase the computing power available for scientific research in Australia.

A feature of the CDC 3600 computer is its ability to switch from problem to problem so rapidly that it can appear to be working on a number of problems at the same time. This machine forms a most suitable central unit for the network and the system is capable of a considerable degree of expansion in years to come.

Although much of the work load for the basic network of computers will arise from C.S.I.R.O.'s own research work, the computing facilities will be available to other research workers.

The Computing Laboratory wil 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 National Mapping Section and the Ionospheric Prediction Service will be among those using the facilities.

The C.S.I.R.O. subsidiary computers will be compatible with the CDC 3600 computer. They will be capable of handling most types of computing arising from scientific research work in Adelaide, Melbourne and Sydney areas and the compatibility will permit problems to be transferred from subsidiary computers to the central CDC 3600 if they become too big or if local subsidiary computers become temporarily over-loaded.

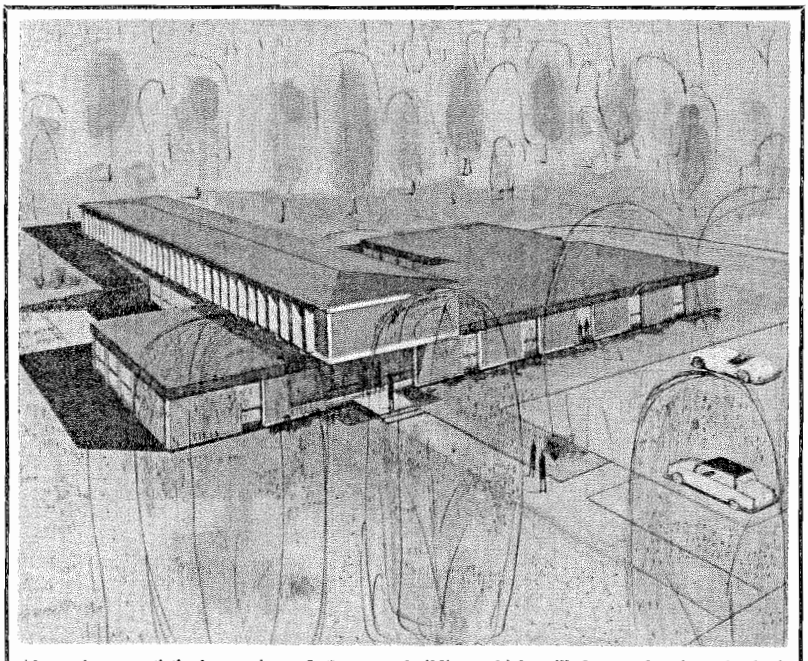
The scheme for a compatible network of scientific computers has attracted considerable interest overseas, and the specifications of the basic network has received favourable comment from a number of computer laboratories and manufacturers.

The computer specifications have been prepared by a committee of Australian scientists, including representatives of the Atomic Energy Commission, the Australian Universities Commission and C.S.I.R.O., under the Chairmanship of Professor S. A. Prentice, Professor of Electrical Engineering at the University of Queensland.

At the same time as the contract for C.S.I.R.O.'s computing equipment was announced, the Chairman of the Australian Universities Commission, Sir Leslie Martin, announced that the Commission would propose the acquisition of a number of satellite computers by certain universities during the period 1964-66.

Sir Leslie said that, ever since the matter of Commonwealth-supported computers was considered about three years ago, the Australian Universities Commission had been closely associated with C.S.I.R.O. and other Commonwealth scientific agencies in detailed consideration of the most appropriate type of computers for scientific and training purposes and in the formulation of the national scheme for an integrated network of computers.

The Commission's first concern had been to ensure that all universities had some computing facilities for scientific and training purposes, even before the national network came into being, so that the output of students familiar with the use of computers could be accelerated. He said that there was an acute shortage of well-trained people in this field.



Above is an artist's impression of the new building which will house the Organization's computer installation. The building was designed by the Canberra Branch of the Commonwealth Department of Works and a £135,487 contract for its construction was let recently to Kennedy and Bird Pty. Ltd. It will be situated on the lower slopes of Black Mountain, Canberra, and excavations for the foundations have already begun.

The building will be broadly cruciform in plan. The short section of the cross will be of single storey construction and the longer section of two storeys. The structure will be of reinforced concrete construction with external finishes of exposed concrete frame and face brick infill panels. The window frames will be of aluminium and there will be double glazing in the computer area. The roof will be low pitched.

The computer installation, together with electrical and mechanical plant rooms, administration areas and staff amenities are to be located on the ground floor. The removable floor, wall partitions, windows and ceiling of the section in which the computer and its ancillary equipment will be installed are based on a common module. This allows flexibility for possible future arrangement and layout. The first floor will house a series of programming offices and an instruction room. Office windows on the first floor will face north-east and south-west. Sun protection of these offices will be provided by a combination of precast concrete blades and horizontal hoods. The site will be landscaped and provision has been made for off-street parking for both visitors and staff.

TECHNICAL ASSOCIATION NEWS

At the time of writing the new Central Council, staffed by members in New South Wales, is preparing for the first meeting. So that all branches may have representatives to put their points of view, the following members have offered their services as proxies:

Queensland — Lee Brunkhorst (Division of Coal Research).
Victoria — Harry Gillette (Division of Physics).
South Australia — Tom Dagg (Division of Animal Physiology).
Western Australia — Hans Buitenhuis (Division of Animal Physiology).

Already the Central Council Work Value Sub-committee has held another meeting with two new members, Messrs. Abel and Wasson.

Information correlated from the questionnaire is gradually being developed for our salary claim.

Following the report and quote from Taylor and Scott (solicitors) through their Industrial Advocate, Mr. Daniel Ross, the Sub-committee has recommended to Council that Mr. Ross be engaged to prepare and present our case before the Public Service Arbitrator.

They have also recommended a levy be struck to cover his fee.

At a date to be arranged in the very near future, the General Secretary, Bill Menzies, will be going to Melbourne for a conference with Mr. Jack Coombe on the recent margins decision and our Salary Claims.

Also, a meeting has been arranged with representatives of the A.A.E.S.D.A. to discuss with them their recent Memorial for Technical Staff at the Atomic Energy Commission Establishment at Lucas Heights in Sydney.

Mr. Ron Kemp, Federal President of the Officers' Association, has offered his co-operation and advice should we need it.

New Research Organization for Thailand

Thailand is to have a national research organization based on C.S.I.R.O. as a prototype. The Thai National Assembly recently passed an Act establishing the Applied Scientific Research Corporation of Thailand as the Government's principal agency for scientific research. The Act was drafted by C.S.I.R.O.'s Officer for International Co-operation, Mr. Frank Nicholls, who has visited Thailand for this purpose three times in the last three years.

Mr. Nicholls has spent most of the past three years working in South-east Asia and has visited Pakistan, India, Ceylon, Thailand, Cambodia, South Vietnam, Malaya, Indonesia and the Philippines.

He was a member of the Science Commission appointed by the President of Pakistan in 1959 to examine the country's scientific effort.

The Thai Research Corporation will be concerned with research for agriculture, industry and health, and will concentrate on problems affecting national development.

Its Governing Board will consist of two Governors, a Special Governor, and four non-voting part-time Consultants.

Mr. Nicholls has been asked to lead the Research Corporation during its formative period, and will be seconded to the United Nations during this time. He will leave Australia shortly to take up his new assignment.

Mr. Nicholls has prepared a critical assessment of the problems which have impeded the development of research in Thailand and copies of his report have been widely circulated.

The preparation of this report involved an examination of the three Thai universities concerned with scientific activities — Chulalong Koon University, Kasetsart (Agricultural) University, and the University of Medical Sciences, as well as the many laboratories and field stations in the Kingdom.

Mr. Nicholls worked in Thai laboratories and visited all parts of the country. He learnt Thai and can now read and write the language as well as speak it.

The newly-formed Research Corporation has considerable freedom of action. It is to determine the terms and conditions of employment of its staff without outside supervision, and will receive its Treasury funds as a grant with full power to make inter-item transfers.

Its initial research programme will be organized under an Agricultural Research Institute and Technological Research Institute. A Medical Sciences Research Institute will be added later.

The Thai Government has set aside ample funds for the work during an initial five-year period.

Considerable assistance in providing expert help in guiding research programmes, in training staff, and in providing the essential basic equipment and supplies will be forthcoming from the United Nations Special Fund.

Close co-operation with the universities is a feature of the Research Corporation's plan of operations, and research within the universities is to be encouraged through grants and co-operative programmes.

The staff of the Research Corporation will be mainly Thai, although during the first five years it will be necessary to place considerable reliance on outside experts as research leaders.

There are many Thai graduates who have had post-graduate experience abroad and they will form the nucleus of the research staff. An overseas programme to provide post-graduate research experience will enable the research team to be brought up to the required strength. A target of 150 research workers by 1969 is expected to be met.

The United Nations is watching this new research unit with particular interest.

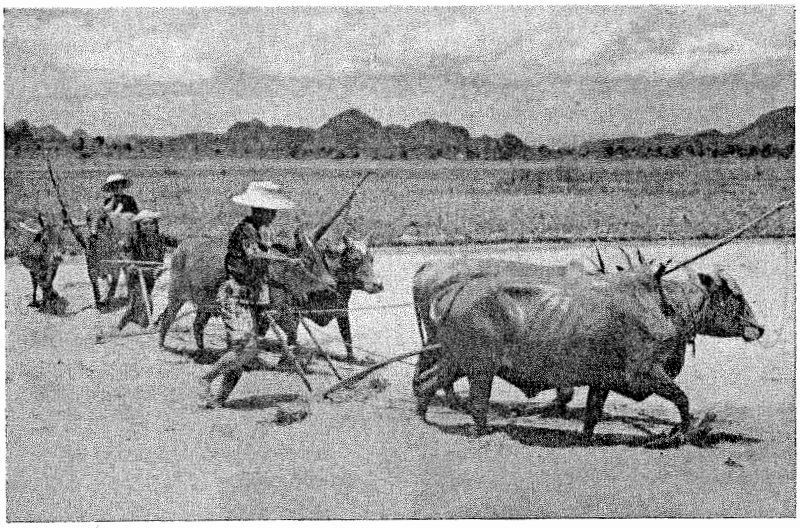
At the U.N.C.S.A.T. meeting in Geneva in February, 1963, there was widespread support for Mr. Nicholls' thesis that a developing country can improve its situation only if it has its own national research group.

"Governments cannot depend on outside experts for advice on the variety of technical decisions called for in development programmes," said Mr. Nicholls.

"It is essential that they have their own scientific advisers who are able to take decisions against a background of relevant local conditions."

"For this reason action should be taken to establish indigenous research organizations to harness science to national development."

The Thai Research Corporation may well become the model for similar institutions in other developing areas.



Help has also been promised from several of the international foundations and from bilateral aid programmes.

C.S.I.R.O. will be closely associated with several aspects of the research programme through Colombo Plan aid given by Australia.

This will include help with resources surveys of the north-eastern and central plains regions; plant introduction and soil fertility studies; work on plant fibres; and industrial feasibility studies.

Assistance will also be given in organizing the central services group providing accounting, personnel, and registrary facilities.

The early work of the Research Corporation will have a heavy applied basis, making use where possible of existing science rather than discovering new knowledge.

However, longer-range and background research will not be neglected.

Our picture shows farmers harrowing a rice seed bed near Rat Buri in the central plains region of Thailand. Controlled irrigation, which is due in 1966, will enable two crops to be grown each year. Land research studies to be undertaken shortly by the Applied Scientific Research Organization of Thailand will help determine suitable alternative second crops.

FOOD CONGRESS

At the recent World Food Congress in Washington Mr. C. S. Christian, a member of the Executive, said that the world had ample physical resources to meet the food needs of the growing global population "for the remainder of this century at least, and probably much longer."

Mr. Christian said that available scientific knowledge could meet the challenge of the effective use of these resources.

"Economic and political factors may continue to retard the full use of world resources and the free flow of products from one part of the world to another," said Mr. Christian.

"The regions now most deficient in food are the ones where future populations are likely to be the greatest, and each food-deficient country should endeavour to solve its own food problems as far as possible from its own resources."

Mr. Christian proposed that an international centre be established, possibly under the F.A.O., to train people in methods of assessing technically the resources of their own countries.

Dr. O. H. Frankel, a member of the Executive, later told the Congress that the foremost need was for more and better universities in developing countries.

"There must be a vast untapped reservoir of scientific and technical ability which awaits the opportunity of training," he said.

"And while there is a need of training at all levels — scientists, teachers, technologists, engineers, extension workers, and many more — the key, the focal point, is the university."

Dr. Frankel said many facets of research still required basic studies and—if solved—would make a dramatic impact on the food-producing capacity of the earth.

Assistant for Chairman

Mr. A. F. Gurnett-Smith, of the Division of Land Research and Regional Survey, has been transferred to the Secretariat to act as scientific assistant to the Chairman, Sir Frederick White.

MARKET FOR DAIRY PRODUCTS IN ASIA

The problem of Asia's inability to pay for Australian dairy products was not insoluble, said Dr. S. H. Bastow, a member of the Executive, at the recent annual conference of the Victorian Dairyfarmers' Association.

Dr. Bastow, who was delivering the George Howey Memorial Oration, said that a payments problem would be overcome as industrialization of Asia progressed.

A new world, he said, lay before the dairying industry.

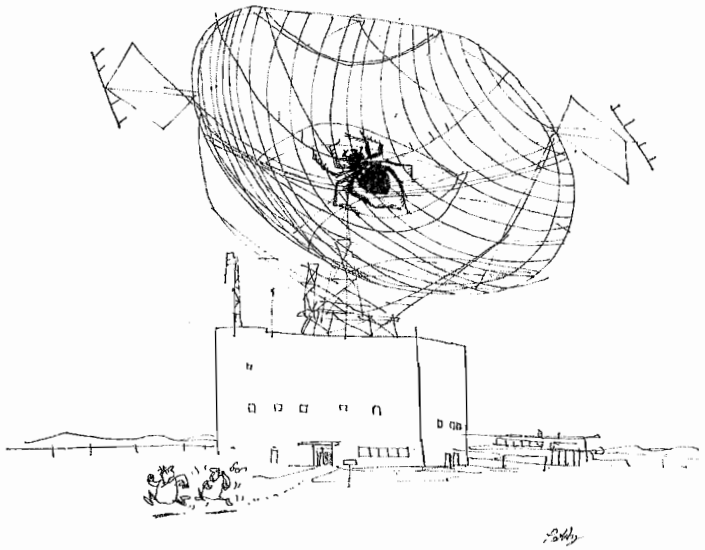
It was in those countries of Asia or elsewhere whose population had not so far included milk products as a major item of diet.

There were two main problems. The first was that most of the populations were too poor to pay Australia's prices.

The second was that even those who could afford to buy, and were not prevented by import restrictions, must have the dairy food presented to them in forms they found more attractive than those of other competing high protein foods.

Neither problem was insoluble, he said. As industrialization developed in India and elsewhere in the East — and it was developing fast — there must be a corresponding increase in the fraction of the population employed in heavy industry.

And that must call for a higher protein intake.



Copyright London Punch.

THIS MONTH'S OVERSEAS TRAVELLERS

Dr. G. D. Aitchison, Officer in Charge of the Soil Mechanics Section, returned recently from overseas after attending the African Regions Conference on Soil Mechanics and Foundation Engineering at Salisbury, Rhodesia.

Dr. L. Barton-Browne of the Division of Entomology left for the U.S.A. last month where he has been invited to work with Professor E. G. Hodgson at Columbia University for about two months. He will also take part in a Symposium on Chemi-reception in Arthropods to be held during the International Congress of Zoology in Washington next August. He will visit a number of research centres in the U.S.A. and the U.K. before returning to Australia.

Dr. K. McG. Bowling of the Division of Coal Research left last week for the United States where he will attend the Gordon Research Conference on Coal Science and visit a number of institutions concerned with gasification research.

Mr. G. F. H. Box, of the Division of Chemical Physics, is at present visiting research centres and commercial firms in the United States in connection with developments in electronic instrumentation. He will also visit the U.K., Germany, Holland, France, Switzerland, Italy and Japan. Mr. Box will attend the International Electronics Components and Semi-Conductor Symposium in Basle and will also visit licensees of the Division's patents in the field of atomic absorption spectroscopy for discussions concerning the various items of electronic auxiliary apparatus developed by him.

Mr. A. R. Hayley, of the Division of Textile Physics, will spend about five months working with Professor Dole of the Chemistry Department of North-Western University, Illinois, on calorimetry of polymers. He will spend about two weeks visiting research centres in London before this and will attend the American Chemical Society Conference on thermal analysis of high polymers in New York City.

Mr. W. Ives, Associate Member of the Executive, is at present in London for the Interim Review Conference of the Commonwealth Agricultural Bureaux.

Mr. W. B. Kennedy of the Division of Building Research is at present working on building operations and economics at the Building Research Station in England. He will attend the International Conference on Operational Research in Oslo this month and will visit a number of research establishments in the U.K., Europe, and the U.S.A. before returning to Australia towards the end of the year.

Dr. H. S. McKee of the Division of Plant Industry is at present on a nine month plant collecting mission to France, South and Central America, the West Indies and Hawaii. Dr. McKee will collect plant materials for trials as fodder plants in the warm parts of Australia and will establish contacts with institutions able to provide such materials on an exchange basis.

Mr. R. G. Pearson of the Division of Forest Products left last month to study current research and developments in timber engineering overseas. Initially he will go to South Africa by invitation of the National Building Research Institute, C.S.I.R., for consultations with officers of the recently formed Timber Unit. He will then visit the main research laboratories in his field in Great Britain, Europe, Scandinavia and North America, and will spend some time with several timber designing and fabricating firms. During September, he will attend the Conference of Section 41 of the International Union of Forestry Research Organizations (IUFRO) and the FAO Conference in Wood Technology to be held at the Forest Products Research Laboratory, Madison, Wisconsin.

Dr. A. L. G. Rees, Chief of the Division of Chemical Physics, left last month for overseas where he will attend the XXIInd Conference of I.U.P.A.C. in London as leader of the Australian delegation, and meetings of the Commission on Physico-Chemical Data and Standards. Dr. Rees will also attend the XIXth International Congress of Pure and Applied Chemistry in London, and visit various institutional and industrial laboratories in U.K., U.S.A., Canada, Norway and Japan.

Dr. R. O. Slatyer of the Division of Land Research and Regional Survey, left Australia last week for the U.S.A. where he will spend about nine months at the Duke University, Durham, North Carolina, working in the Department of Botany and Forestry with Dr. Kramer and Dr. Billings. Dr. Slatyer will also attend the UNESCO Latin American Arid Zone Conference in Buenos Ayres next September.

Dr. P. L. Waters of the Division of Coal Research left recently for the U.S.A. where he will attend the Gordon Research Conference on Coal Science at New Hampshire. On his way to the States he spent a week in London visiting the British Coal Utilization Research Association.

Japanese Visitor

Mr. Eikichi Suzuki has been nominated by the Japanese authorities for an Australian International Award to undertake twelve months study of the higher structure of protein fibres. He has commenced work at the Division of Protein Chemistry.

An engineering graduate of Yokohama National University, Mr. Suzuki has been engaged in research on the fine structures of fibre-forming high polymers at the Textile Research Institute, Yokohama since 1955.

THREE TWOS IS THREE

The identical triplet calves featured above with Mr. G. Arnold and Mr. Redpath of the Division of Plant Industry may be regarded, according to the statistical experts, as three sets of identical twins. This may be all very well for the statistician but is rather confusing to anyone else. Identical triplets in cattle are so rare that it is doubtful if anyone has determined how often they occur, but it is probably much less than once in a million calvings.

Identical twin calves are comparatively common — with dairy breeds they are found about once in every 2,000 calvings. Since the use of genetically identical animals in experiments enables research workers to conduct their investigations with considerably fewer animals, identical twin calves are much sought after. Hancock in New Zealand has established experimentally that each member of a set of identical twins will replace, without loss of statistical efficiency, 22 unrelated animals when measuring milk yield, 9 when measuring growth rate, 72 when measuring grazing time and 8 when measuring pasture intake.

Much more can be done experimentally with identical triplets, but that's something which might best be left to the statistician to work out.

New Appointees

Miss P. M. Bell, who obtained her M.Sc. from the University of Sydney last year, has joined the Wheat Research Unit where she will work on the course of hydrolytic enzyme re-actions in wheat flour doughs and other related systems.

Mr. D. A. Bigham, a recent science graduate from the University of Adelaide, has been appointed to the Division of Organic Chemistry where he

Mr. D. A. BIGHAM

will take part in the Division's investigations on the isolation and structural determination of biologically active substances of natural origin, and on synthetic organic chemistry, particularly in the fields of organo-metallic and organo-phosphorus chemistry.

Dr. J. B. Coombe has joined the grassland agronomy section of the Division of Plant Industry. A graduate in agricultural science from the University of Melbourne, Mr. Coombe obtained his Ph.D. at the University of Melbourne in 1961 and has since been undertaking post doctoral work at the Rowett Research Institute in Scotland.

Mr. M. J. Goodspeed has been appointed to the Division of Land Research and Regional Survey where he will undertake research on problems of surface and ground water hydrology. Since graduating in science from the University of Aberdeen he has worked with the Royal Naval Scientific Service, the General Electric Company in London, the Bureau of Mineral Resources and the Department of the Interior.

Mr. R. L. Hall has been appointed to the Division of Tropical Pastures where he will take part in the Division's agrostological investigations in the spear grass region of Queensland. Since graduating B.Sc.(Hons.) in the faculty of Agriculture at Nottingham University in 1959 he has been a demonstrator at the Grassland Research Institute at Hurley.

Dr. C. W. Rose has joined the Division of Land Research and Regional Survey where he will take part in research on plant - micro - environment studies concerned particularly with the efficiency of water utilization by plants. After graduating B.Sc. from the University of Sydney in 1949 and B.Eng.(Aeronautical) from the University of Melbourne in 1951, he worked for some years on air frame design, stress analysis and testing. Since 1954 he had been a member of the staff of the Physics Department of Makerere University College, Uganda, where he has carried out research in the field of agricultural physics. He obtained his Ph.D., London, in 1958.

Mr. B. P. Ruxton has been appointed to the Division of Land Research and Regional Survey as a member of the Division's survey team conducting potentiality surveys of underdeveloped regions. A graduate from Cambridge University, Mr. Ruxton has been a geologist with the Geology Survey Department of the Sudan Government, a lecturer in geology at the University of Hong Kong, and a lecturer in geomorphology within the Department of Geology of the University of Ghana. For the last three years he has been a geologist with the Bureau of Mineral Resources.

Mr. P. Jakobsen has joined the Analytical Group of the Division of Protein Chemistry where he will work on the development and improvement of analytical techniques required in protein research. A graduate in agricultural science

Mr. P. JAKOBSEN

from the Royal Veterinary and Agricultural College, Copenhagen, Mr. Jakobsen has worked with the Department of Works and the P.M.G.

Dr. D. H. Solomon has been appointed to the Division of Applied Mineralogy where he will carry out research on certain clay-organic complexes and other mineral-organic complexes. After graduating in science from the University of New South Wales in 1953 he became a demonstrator and teaching fellow in the University's Organic Chemistry Department. In 1956 he joined the Resin and Polymer Section of the Balm Paints Research Laboratory and in 1959-60 was seconded to the I.C.I. Research Laboratory, Paints Division, in the U.K. He received his Ph.D. from the University of New South Wales in 1959.

Mr. D. H. SOLOMON

Mr. I. J. Spark, a science graduate from the University of Melbourne, has joined the Division of Tribophysics where he will assist in the research activities of the metal physics group.

Wildlife Belts Up

Few people dispute that safety belts in cars do save lives. Recently a number of organizations, private and public, have fitted them to company and official cars.

Head Office drivers, for example, have found that cars on hire from the Department of Supply have been equipped with safety belts for several months.

Recently the Division of Wildlife Research decided to equip all its vehicles with belts. Other Canberra divisions have shown interest, and Entomology will soon follow suit.

The day may be not far distant when safety belts will be standard fittings in C.S.I.R.O. vehicles.

Printed by C.S.I.R.O., Melbourne.

053##1963

CORESEARCH

FOR CIRCULATION AMONG MEMBERS OF C.S.I.R.O. STAFF — NUMBER 53, MELBOURNE, AUGUST 1963

AGRICULTURAL RESEARCH SECTION 1963 LIBRARY

NEW CHIEF FOR SOILS

Professor E. G. Hallsworth, Professor of Agricultural Chemistry at the University of Nottingham, has been appointed Chief of the Division of Soils. He will succeed Mr. J. K. Taylor, who retires this month after 36 years service with C.S.I.R.O.

Professor Hallsworth graduated B.Sc. at the University of Leeds in 1936 and became Assistant Lecturer in Agricultural Chemistry at that University.

He obtained his Ph.D. from Leeds in 1939 and in 1940 came to Australia as Lecturer in Agricultural Chemistry at the University of Sydney.

In 1950 he returned to England to become Professor of Agricultural Chemistry and Dean of the Faculty of Agricultural Chemistry at the University of Nottingham, where he took a leading part in building up one of the most flourishing departments of agriculture in the United Kingdom.

In 1960-61 Professor Hallsworth revisited Australia as Visiting Professor of Soil Science at the University of Western Australia.

The Division of Soils is one of the oldest and largest of the C.S.I.R.O. Divisions and was founded in 1927.

It has its headquarters and main laboratories in Adelaide and branch laboratories in Brisbane, Canberra, Perth and Hobart. It has a staff of some 150 people, about 80 of whom are graduate scientists.

The Division is concerned with research on soils, including pedological, chemical, physical, microbiological and mineralogical studies, together with the integration of these in investigations of soil fertility and the relationship between plant growth and the soil environment.

Professor E. G. HALLSWORTH

Although Professor Hallsworth will not be able to take up his new duties until after next Easter, it is expected that he will visit the Division for a few weeks in October and November this year.

In the meantime, Mr. Taylor will continue to act as Chief of the Division.

Memorial Lecture

Following the death in April, 1961, of Sir David Rivett, several of his colleagues proposed that a suitable memorial should be established to preserve the vigorous stimulus of his leadership.

Sir David was Chief Executive Officer, and later Chairman, of the Council for Scientific and Industrial Research.

He was, more than any other person, responsible for establishing the pattern of C.S.I.R.O. as we know it today.

Those who worked with Sir David felt that the most fitting memorial for him would be the establishment of a David Rivett Memorial Fund which could be used to finance a formal lecture to be delivered in one or other of the capital cities of Australia once every two years by a man who had reached the highest ranks of achievement in scientific research.

Following a most successful appeal, arrangements have been made for the first memorial lecture to be delivered by the President of the Royal Society, Sir Howard Florey, at Wilson Hall, University of Melbourne, on Thursday, 5th September.

The title of the lecture will be "The Development of Modern Science".

Sir Howard Florey was born in Adelaide in 1898. He was educated at the Universities of Adelaide and Oxford and has been Professor of Pathology at Oxford since 1935.

He was knighted in 1944 and in the following year he was awarded jointly with Dr. E. B. Chain and Sir Alexander Fleming a Nobel Prize for Medicine in recognition of his work on the applications of penicillin.

In 1957 the Royal Society, into whose Fellowship he was elected in 1941, awarded him the Copley Medal, its highest award.

Sir Howard will come to Melbourne in August to open the University of Melbourne's new £370,000 Howard Florey Laboratory for Experimental Physiology.

OBITUARY

Dr. Andrejs Steinbergs, of the Division of Plant Industry, died on Sunday, 23rd June, at the age of 59 years.

Dr. Steinbergs graduated in Industrial Chemistry at the University of Riga, Latvia, in 1934. He came to Australia in 1949 and joined the Division of Plant Industry. He worked for a short period at the Western Australian Regional Laboratory before moving to Canberra early in 1950.

His work in the Division was concerned mainly with the study of sulphur in soils. An analyst of outstanding skill and ability, Dr. Steinbergs developed new methods for the analysis of sulphur in soils and plant material. He used these methods in subsequent studies related to the availability of soil sulphur to plants and the role of sulphur fertilizers in soil fertility. His contribution to this field of soil-plant science was a valuable one.

In the fourteen years he was with the Division, "Andrew" Steinbergs proved himself a true friend to many.

His death is a great loss both to science and to his many friends and colleagues.

Kangaroo Enthusiast

During his visit to the United States last year Dr. G. B. Sharman, of the Division of Wildlife Research, gave a lecture on the biology and reproduction of the kangaroo.

A young member of his audience, Pat Berger, was so fascinated by his lecture and by the film he showed that she wrote to him asking if she could obtain a temporary position with the Division to assist with the laboratory work on kangaroos.

Miss P. BERGER

Pat, who is 20 years old, is a student at Wellesley College, Massachusetts, where she has just completed the third year of a four year B.A. degree course with a major in Zoology.

She paid her own fare to Australia and is now working with the Division's marsupial team during her university vacation.

Her personality, determination, skill and rapid application to the work have earned her the genuine admiration of her colleagues and the research staff.

APPOINTMENTS VACANT

The following vacancies for professional appointments are current:

EXPERIMENTAL OFFICER (E.O. 1/2).—Division of Entomology. 180/224 (September 20).

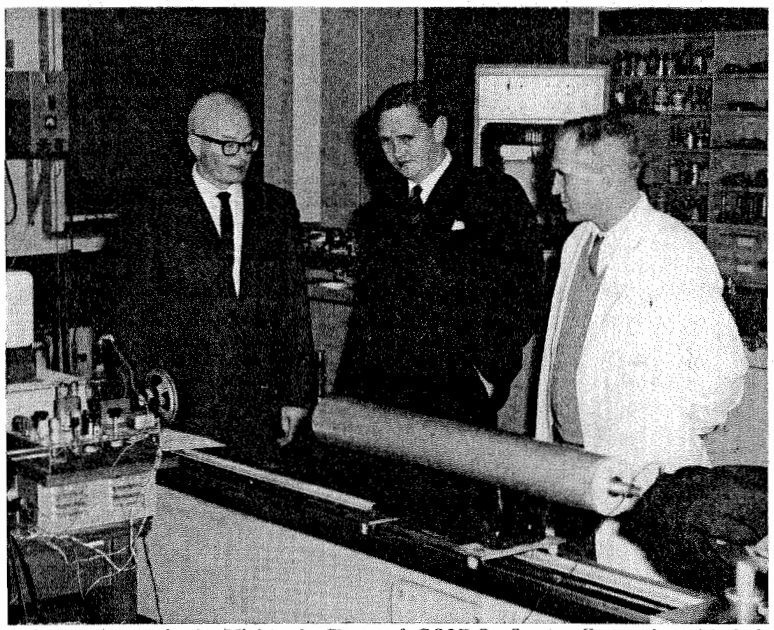
PLANT PHYSIOLOGIST (R.O./S.R.O.).—Horticultural Research Section. 490/124 (August 16).

MATHEMATICIAN OR THEORETICAL PHYSICIST — (S.R.O./P.R.O.).—Division of Food Preservation. 300/368 (August 9).

VETERINARY PARASITOLOGIST (E.O. 2/3).—Division of Animal Health. 201/190 (August 16).

VETERINARY BACTERIOLOGIST (R.O./S.R.O.).—Division of Animal Health. 202/220 (August 9).

EXPERIMENTAL OFFICER (E.O. 1/2).—Division of Textile Industry. 464/306 (August 16).



In the last few weeks the Minister in Charge of C.S.I.R.O., Senator Gorton, has visited the National Standards Laboratory in Sydney and the Divisions of Entomology, Land Research and Regional Survey, and Wildlife Research in Canberra. Our picture shows Senator Gorton at the National Standards Laboratory with Dr. R. G. Giovanelli (left), Chief of the Division of Physics, and Dr. J. V. Ramsay examining equipment for audio communication using frequency modulated light as a carrier. This equipment was developed by Dr. Ramsay.

HORTICULTURAL RESEARCH SECTION 1963 LIBRARY

C.f 607 (085.3) CO

MINING IN NORTH QUEENSLAND

Last June a small group from C.S.I.R.O. visited the mining centres of Mount Isa, Mary Kathleen and Weipa in North Queensland to learn as much as possible about recent developments in the mining industry in this remote, but important, part of Australia.

The party also had discussions with the staff of the mining companies on how C.S.I.R.O.'s research programme might be aligned to give the greatest help to the industry.

Members of the group were Lord Casey, Dr. S. H. Bastow, and Dr. I. W. Wark, of the Executive; Professor E. Rudd, a member of the Advisory Council; Mr. R. G. Thomas, former Chief of the Division of Mineral Chemistry; Mr. A. J. Gaskin, Chief of the Division of Applied Chemistry; Mr. I. E. Newnham, Chief of the Division of Mineral Chemistry; and Mr. L. Lewis, Officer in Charge of the Industrial Research Liaison Section.

Mount Isa was the first stop for the party. Here, at Australia's largest non-ferrous metals mine, lead-zinc-silver ore and copper ore are brought to the surface through one shaft at the rate of ten thousand tons a day—a major engineering achievement.

Silver-lead ore was first discovered at Mount Isa in 1923 by John Campbell Miles, a lone prospector travelling through this wild and remote area on horseback. Then, as now, this cattle country was divided into runs each of hundreds of square miles.

The mining company that was founded in 1924 to work the ore body discovered by Miles passed through many vicissitudes before it paid its first dividend in 1947.

Originally Australian-owned, the mine proved in its early years to be a sink for money. Control passed first to a British firm, Russo-Asiatic Consolidated Ltd. (later the Mining Trust Ltd.), which provided capital until even its large resources were overstrained.

Then the American Smelting and Refining Company, of New York, provided additional capital, and now the American firm holds more than half of the common stock.

Of recent years the operation of the mine has been highly profitable. Exploration in the last ten years has revealed immense deposits of both lead-zinc and copper ores, making Mount Isa one of the great base metal deposits of the world.

These discoveries have resulted in a huge programme of expansion. Over £30 million has been invested by the company in the last six years in expanding production.

A sum almost as great is being spent by the State Government, with Commonwealth support, in rebuilding the railway between Mount Isa and Townsville, where the company's copper refinery is situated, and which is the port for shipment of concentrates and metal.

Up till now this railway has been a bottleneck in restricting the rate at which production can be expanded, but even so Mount Isa Mines Limited has for some time been Australia's largest individual exporter in terms of sales to overseas customers.

A feature of the long-range development programme that has made Mount Isa a much more pleasant place for the 14,000 people who live there, is the construction of Lake Moondarra, a reservoir of 17½ thousand million gallons capacity, made by damming the Leichhardt River.

In conjunction with the Rifle Creek dam, which previously supplied the town, the storage of Lake Moondarra ensures that there is always an ample water supply.

In addition the lake provides a popular pleasure resort twelve miles from Mount Isa. Swimming, water-skiing, fishing and boating are round the year sports in the North Queensland climate.

Although the commercial section of Mount Isa is far from beautiful, the area in which the company has built houses for its staff is an oasis in the dry landscape. The air-conditioned houses are very comfortable, and because of the ample water supply gardens are cool and colourful.

From Mount Isa the C.S.I.R.O. team travelled by air taxi and car some forty miles east to Mary Kathleen.

This is the site of a unique deposit of uranium and rare earths that was discovered in July, 1954, by a prospecting syndicate led by two Mount Isa identities, Clem Walton and Norman McConachy.

The open cut mine is on a steep hillside. At present it is producing about six thousand tons per day of uranium ore.

The changing fortunes of Mary Kathleen Uranium Limited typify the ups and downs of the mining industry. The plant was put in operation in June, 1958, following an intensive period of planning and construction.

Since then it has earned millions of pounds for its shareholders, while fulfilling a £40 million contract for the United Kingdom Atomic Energy Authority.

In September the mine is to be closed down for an indefinite period, because demand for uranium does not justify continuing production. The mine and township will be maintained so that operations can be renewed when demand improves.

Mary Kathleen township is a model mining community. The town was laid out in a valley, with good soil, about three miles from the mine.

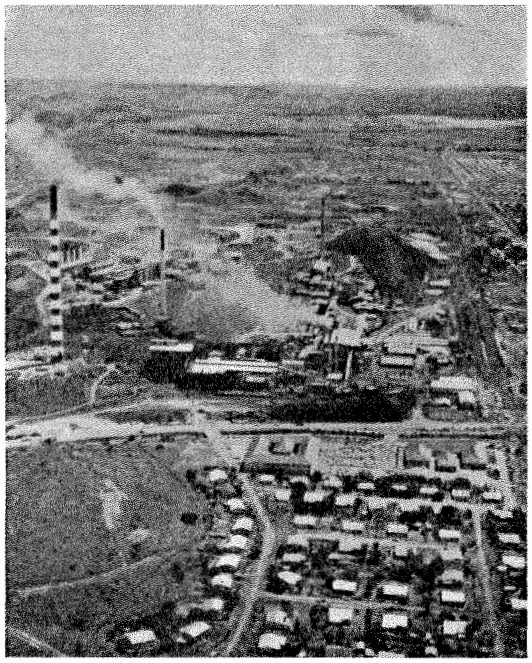
Most of the population of about a thousand is made up of families, living in two or three bedroom, all electric, houses which they rent from the company.

The houses are all built with east-west orientation and have ample provision for through passage of air to temper the severe heat of summer.

There are quarters for single men, and all employees and their families share a cafeteria which seats 350 people comfortably.

The most striking feature of the town is its garden setting. During the construction no tree was cut where this could possibly be avoided, and as a result, the white ghost gums, the green lawns, and the flowering trees and shrubs make a colourful picture.

Though rain falls rarely in the dry season, water is in abundant supply all year round. Two reservoirs have been built, one on the Corella River and the other on the eastern branch of the Leichhardt.



View looking north across the Mt. Isa mill and smelters showing the 503 ft. stack for the new copper smelter on the far left.

For years the Corella reservoir was treated with cetyl alcohol by the Mansfield process to reduce evaporation, but recently water has been so plentiful that treatment has been stopped as it is unnecessary.

The East Leichhardt dam was built as an insurance against drought and has never been used to supply the mine or town.

From Mary Kathleen the party returned to Mount Isa, then on to Townsville where a day was spent in visiting the copper refinery of Mount Isa Mines Limited, North Australian Cement Ltd., and Townsville University College.

The party then moved on to Cairns for an overnight stay before flying to Weipa, via Cooktown.

Weipa is the site of immense deposits of high grade bauxite, the raw material for production of aluminium.

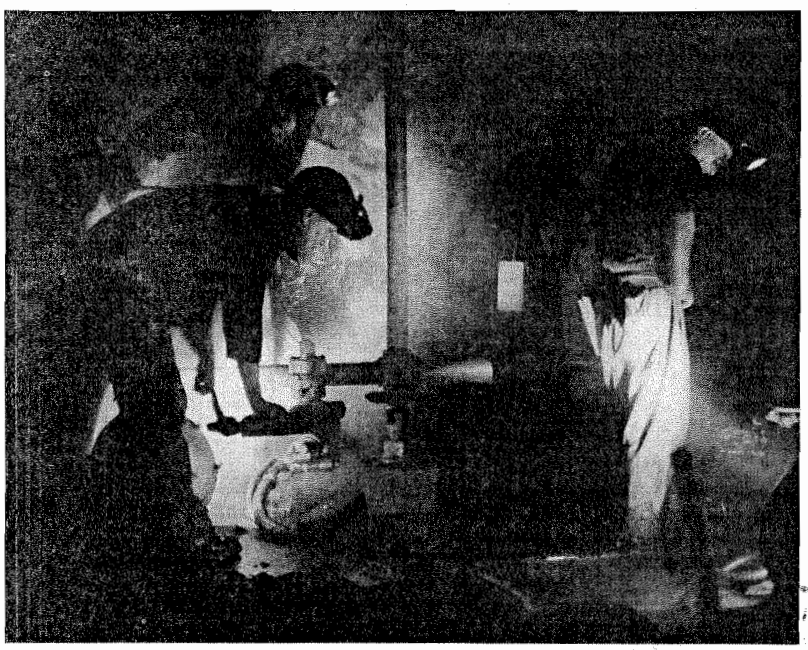
Bauxite is produced by COMALCO Industries Pty. Ltd. to supply the company's aluminium plant at Bell Bay, Tasmania, and to fulfill a major contract to Japan. Shipments are also sent to Europe.

The mining operations are only a few hundred yards from the loading jetty, which can take large ore carriers up to 20,000 tons displacement.

The COMALCO community at Weipa is a small one of about eighty men. There is also a camp, maintained by the Dutch dredging firm that has almost completed dredging the port and its approaches.

A Presbyterian mission, the original Weipa settlement, is in close proximity to the mine. Here live some 200 aborigines, some of whom are employed by the mining company.

The party were all tremendously impressed with what they saw in North Queensland. The vastness of the country, its few occupants, its mineral wealth, all strike the visitor forcibly and provide him with much to think about.



Miners underground at Mt. Isa.

TECHNICAL ASSOCIATION NEWS

The newly formed Central Council, staffed by members in New South Wales, met in the National Standards Laboratory Cafeteria on 17th June, 1963.

A.C.T. Election Results.

The A.C.T. Branch will again function as a full branch with the support of sufficient members. N. Bradbury was elected Vice-Chairman and A. Leistner was appointed Branch Publicity Officer.

Central Council

Two steps in the expansion programme of the Technical Association were announced—a grant of £20 to cover initial costs of setting up the recently formed Western Australian Branch was authorized by Central Council, and it was decided that a circular would be sent to all eligible staff in N.S.W., encouraging them to join the Technical Association.

Western Australia was informed that farm assistants were not eligible for membership.

Work Values

A motion was moved that an Advocate be retained to prepare and possibly present the work value case to the Public Service Arbitrator, and that if an Advocate be retained, a levy may be struck for individual members to pay the cost of the Advocate.

When the Memorial for the Technical Staff is submitted to the Arbitrator by the Technical Association, his decision will depend partly on the percentage of Technical Staff represented by the Association.

It is therefore essential that the drive for greater membership of the Association should be successful.

Central Council Meetings

It has been decided to hold Central Council meetings on the third Tuesday of each month.

Patents Aid Research

There are probably many people in C.S.I.R.O. who do not realize that the Organization patents many of the inventions and processes developed in its laboratories.

In fact, C.S.I.R.O. holds several hundred Australian and foreign patents and patent applications, and has entered into licensing agreements concerning more than half of them.

The objective of C.S.I.R.O. in patenting is not, as is often supposed, to protect its right to an invention and operate it for profit, but to bring about the most widespread and effective use of the invention by Australian industry.

Until a few years ago it was taken for granted that publication of the results of C.S.I.R.O.'s research was sufficient to achieve this aim. It was assumed that industry would be keen to put the results of this research to practical use.

However, experience showed that this was not generally so and that further C.S.I.R.O. action was necessary to stimulate the adoption of its inventions.

It is now generally appreciated that C.S.I.R.O. must play an active part to bring about the industrial application of its inventions otherwise many of these will remain unused.

Patents on C.S.I.R.O.'s inventions can be employed to assist the effective industrial use of research results. In some cases, were it not for patents, important research results would not have been brought into practice and the research which led to them would not have been used to the best effect, or may even have been wasted.

In addition processes that require some measures of technical control may become discredited if thrown open for general use without any supervision of the initial stages of application.

Written instructions are often disregarded or misunderstood, and adequate technical assistance may in any case be lacking, with the result that the process may be incorrectly applied and then discarded as unsatisfactory.

Patenting provides an effective method for controlling the use of a process in such a way that technical assistance may be given when it is needed and the good name of the process protected.

Firms that wish to use the process, and are equipped and staffed to do so effectively, can then be licensed under conditions that permit collaboration between C.S.I.R.O. and the firm in achieving a satisfactory technical standard in initial operations.

While this kind of supervision will generally not continue to be exercised beyond the early stages of production, it ensures that technical assistance is available at the time when an invention is most vulnerable to technological shortcomings in firms that employ it.

Similar safeguards can be observed in connection with inventions that take the form of mechanical or electrical devices. In such cases licences usually include a requirement that the licensee submit a production model of the device for approval, which must be obtained before commercial production commences.

In addition, there are some inventions which may be expected to involve a developmental expenditure on the part of the potential users that will be large in relation to the returns that are likely to accrue to a firm undertaking commercial application.

In such cases there may be strong reasons for encouraging manufacture. For example, a specialized instrument may be required for research or production, yet the total market will inevitably be quite small.

A potentially important device that has been carried only to the stage of laboratory operation may require a great deal of development work before commercial application can be commenced.

In circumstances like these no manufacturer may be prepared to risk substantial expenditure on development or tooling unless assured of exclusive rights to the invention for the life of the patent, or possibly for some shorter period.

Granting such a monopoly may represent the only means for securing the application of the invention. Exchange rights cannot be granted unless the invention has been patented.

It must be emphasized that the primary object of patenting C.S.I.R.O. inventions in Australia is to encourage the widest possible use for inventions, and not to obtain revenue from royalties.

The measure of success of this policy is the extent to which it assists in the industrial adoption in Australia of innovations arising from C.S.I.R.O. research.

On the other hand when C.S.I.R.O. inventions are patented in oversea countries it is the general practice to seek normal commercial royalties for their use and in some cases very substantial royalty payments have been received from foreign licences.

The programme of research on wool technology, which represents an important part of the C.S.I.R.O. effort, produces its share of patentable inventions.

In exploiting these inventions considerations arise that differ in some respects from those applying to the bulk of C.S.I.R.O. research developments.

Less than 10% of the Australian wool clip is processed in Australia, and for this reason the application of C.S.I.R.O. inventions in the Australian wool textile industry, while important, is only the first step. If the wool production industry and the Australian economy are to gain the maximum benefit from the promotional possibilities arising from wool research, then these innovations must be applied wherever wool is used.

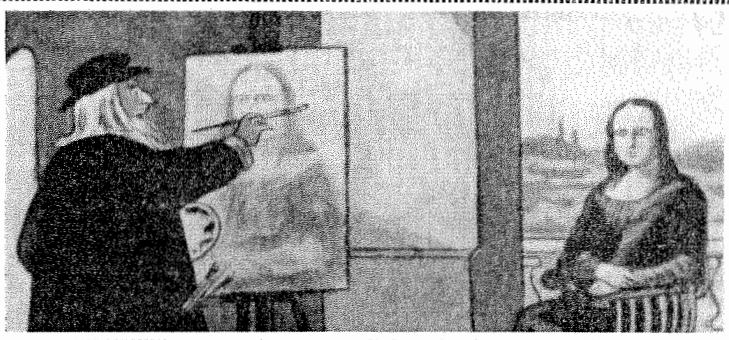
The problems of promoting the use of new processes and processing equipment throughout the wool consuming countries of the world are formidable; however it is very much easier to make suitable arrangements for the commercial development of innovations in overseas countries when these are patented inventions.

To encourage the widest possible application of wool technology patents it is the general practice to charge both Australian and foreign licensees only nominal royalties for their use.

For better or worse the patent system has a firmly established place in the present day industrial scene.

C.S.I.R.O. in seeking the adoption of innovations arising from the work of its research units, finds it desirable to conform to the generally accepted practice of protecting its inventions by patents.

But, whereas the normal and legitimate objective of an industrial firm in patenting is to protect its sole right to an invention for the statutory period of the patent, and to operate it for profit, the primary objective of C.S.I.R.O. in patenting in Australia is to secure the most widespread and effective use of its inventions.



"All right, now, a little smile please."

publish or perish

Towards the end of the 15th Century the Duke of Milan mischievously proposed a debate between professors of the University of Pavia and Leonardo da Vinci. The following dialogue was recorded between the Dean and a professor.

Dean: *"Da Vinci? Doctor or magister?"*
Professor: *"Neither a doctor nor a magister, not even a baccalaureate, but just simply the artist Leonardo — the one who painted the Last Supper."*
Dean: *"Why, have artists become men of science nowadays? Leonardo? Have heard naught of him. What works has he written?"*
Professor: *"None. He does not publish them."*

From *"The Romance of Leonardo Da Vinci"* by Dmitri Merejkowski.

WOOD TECHNOLOGIST FROM CHILE

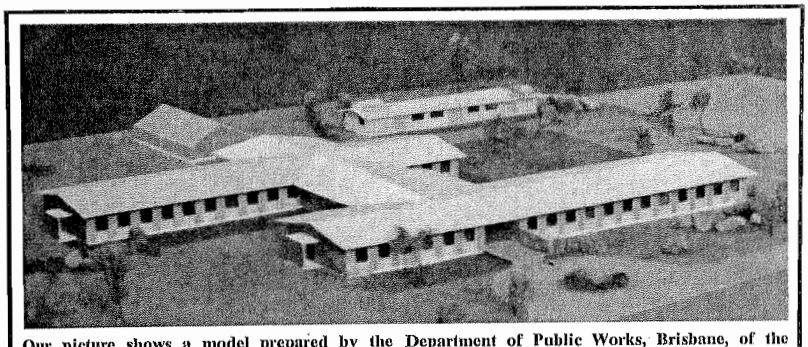
Mr. L. E. Cuevas, Chief of the Department of Wood Technology of the Forestry School at the University of Chile, has been awarded a twelve month fellowship to work with the Division of Forest Products.

He will carry out studies on the seasoning of timber from immature eucalypts prior to preservation treatment.

Chile, in common with most Latin-American countries, has planted eucalypts extensively, and for the past few years has been facing the problems associated with the utilization of the timber from young, quickly grown trees.

In Australia, the utilization of immature eucalypt timbers is now beginning to assume importance, but as yet we have had little experience in meeting the problems involved. The Division, however, has had a very wide experience with older eucalypts, and this should provide an important background to work on younger material.

The results of Mr. Cuevas's research with the Division should be of considerable value to both Australia and Chile, and to countries where eucalypts are grown.



Our picture shows a model prepared by the Department of Public Works, Brisbane, of the proposed laboratory for the Division of Tropical Pastures at Townsville. The main building will occupy some 160 squares and will be air-conditioned throughout. The laboratory will be located on a 50 acre block adjacent to the new Townsville University site at the foot of Mount Stuart and on the banks of the Ross River. The estimated cost of the building is £172,000 and it is hoped to call tenders for its construction in December this year.

Editor-in-Chief

Following the recent retirement of Dr. N. S. Noble as Editor and Officer-in-Charge of the Editorial and Publications Section, Mr. A. E. Scott has been appointed Editor-in-Chief. Mr. Scott was previously Assistant Editor of the Section.

Honours

Dr. J. F. Brotchie of the Engineering Section has been elected to an associate membership of the Institution of Engineers, Australia.

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

Dr. R. O. Slatyer of the Division of Land Research and Regional Survey, who left Australia recently to spend about nine months at the Duke University in North Carolina, has been awarded a Senior Foreign Scientist Fellowship by the United States National Science Foundation during his stay at the University.

Finance Available

As the result of a recent appeal for increased investment in the C.S.I.R.O. Co-operative Credit Society, funds are now available for members wishing to obtain a loan.

At present there is practically no waiting period for loans, 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.

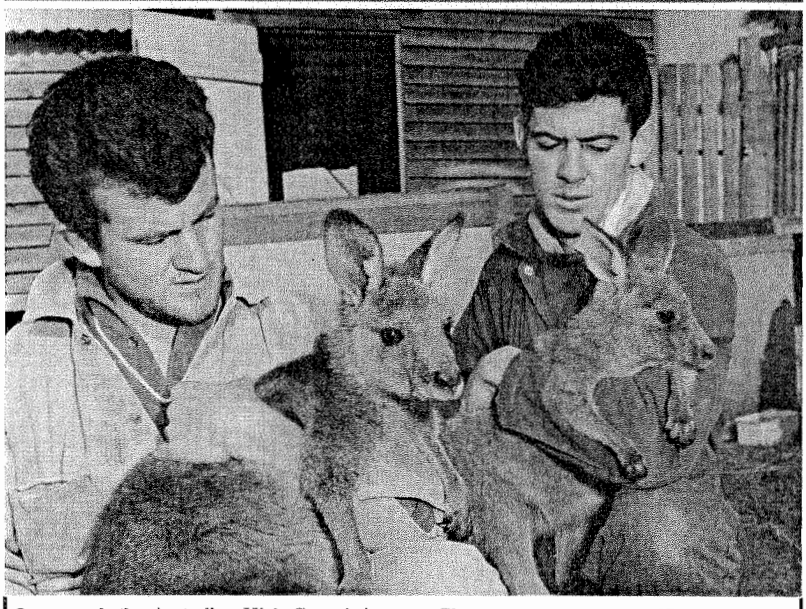
An entrance fee of 2/- is also charged to cover initial costs.

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 £1000, repayable over a period of 5 years, at £9/5/11 a fortnight. 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.

JOEYS FOR PRESIDENT



Last month the Australian High Commissioner to Ghana presented President Nkrumah with a pair of young grey kangaroos. The kangaroos, which were a present from the Australian Government, will be kept in the President's menagerie at Accra. They are shown here with Peter Hanisch (left) and John Libke of the Division of Wildlife Research shortly before leaving for Ghana by plane.

This Month's Overseas Travellers

Dr. G. C. Ashton, of the Division of Animal Genetics, left for overseas last month where he will visit research institutes in North America, England, Europe and Africa. While overseas he will attend the International Genetics Congress to be held in the Netherlands next month.

Mr. M. Feughelman, of the Division of Textile Physics, returned recently from America, where he attended the Gordon Research Conference at Kingston, Rhode Island, and visited research institutes.

Mr. H. McL. Gordon, of the Division of Animal Health, who has been visiting veterinary research centres in the United States, will fly to Germany later this month to attend the XVIIth World Veterinary Congress in Hanover. He will also visit research centres in England and will attend the British Veterinary Association Congress in Wales before returning to Australia next October.

Dr. J. W. Gottstein, of the Division of Forest Products, was a member of the Australian delegation to the F.A.O. World Consultation on Plywood meeting in Rome last month. He will return from Europe via North America where he will study the latest developments in the tinting and colouring of plywood veneers.

Dr. P. Heyligers, of the Division of Land Research and Regional Survey, and **Dr. L. J. Webb,** of the Division of Plant Industry, returned recently from overseas where they attended the Unesco Symposium on Vegetation of the Humid Tropics which was held at Kuching, Sarawak.

Mr. E. A. Jackson, of the Agricultural Research Liaison Section, is at present attending a summer school in science writing at the University of Columbia. He will visit research institutes in the United States, England, Europe and Thailand before returning to Australia at the end of the year.

Dr. H. Katz, of the Division of Textile Industry, returned recently from overseas where he attended the International Wool Secretariat Conference in Sweden and visited research centres in England, Europe, and the United States.

Dr. K. H. C. Key, of the Division of Entomology, is at present on a visit to museums and entomological research institutes in England, Europe and the United States. Later this month he will attend the International Congress of Zoology and associated meetings of the International Commission on Zoological Nomenclature in Washington. He will also visit Hawaii and Nandi on his way back to Australia.

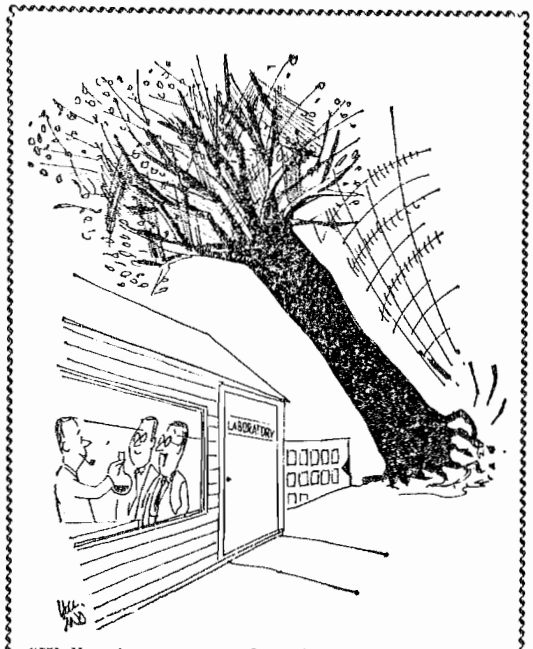
Mr. A. K. Klingender, of Head Office, left recently for America, where he will undertake an eleven month course in public administration with special reference to public relations at the Maxwell Graduate School of Citizenship and Public Affairs, at Syracuse University, New York. At the end of this period he will visit a number of research centres in the United States, Canada and the United Kingdom.

Dr. A. McL. Mathieson, of the Division of Chemical Physics, left for Rome last month to attend the VIth Congress of the International Union of Crystallography. Dr. Mathieson is Convenor of the Open Session of the Commission on Crystallographic Apparatus on "Automatic Single-Crystal Diffractometers", and is one of the official Australian delegates to the Congress.

Dr. G. F. Walker, of the Division of Applied Mineralogy, left recently for overseas where he will study the latest developments in the field of clay organic complexes in England, Europe and North America. Dr. Walker will also attend a number of International Conferences, including the International Clay Conference to be held in Stockholm this month and the meeting of the International Union of Crystallography, which will be held in Rome next September.

Mr. J. Warner, of the Division of Radiophysics, is at present in the United States, where he has been invited to visit the American National Centre for Atmospheric Research at Boulder in connection with a project for investigating conditions within hail clouds. While in America he will visit centres where convection studies of the atmosphere are in progress. He will also spend some time with the Meteorological Research Flight of the Royal Aircraft Establishment at Farnborough, England, and with the Israel Meteorological Service.

Dr. L. S. Williams, of the Division of Applied Mineralogy, is at present studying developments in the fields of special refractories and engineering ceramics in England, Europe, North America and Asia. He also attended the combined conference of the Society of Glass Technology and the British Ceramic Society at Cambridge last month.



"Well, we've out-smarted Mother Nature this time."

Courtesy New Scientist

New Appointees

Mr. R. B. Frenkel, a recent science graduate from the University of Sydney, has joined the Division of Applied Physics. He will assist in the development of techniques and equipment to extend and improve the facilities for precise measurement of direct current at low frequencies.

Mr. R. B. FRENKEL

Mr. G. M. Dobb has been awarded a post-doctoral scholarship for work with the Division of Protein Chemistry. Mr. Dobb will supervise the operation of the Division's electron microscope and will collaborate on investigations of various aspects of protein structure and chemistry, particularly of the fibrous proteins keratin, collagen and myosin. Since graduating B.Sc. from the University of Leeds in 1959 he has worked with the Department of Textile Industry at Leeds University on electron microscopic investigations into various aspects of the structure and chemistry of keratin fibres. He has also studied heavy metal-keratin reactions with a view to locating specific chemical sites by high resolution electron microscopy.

Mr. D. G. James has been appointed to the Division of Food Preservation where he will assist in investigations of the processing of fruits, vegetables and fish at the Tasmanian Regional Laboratory, "Stowell". Mr. James obtained his B.Sc. at Liverpool University in 1960. Since then he has been working in the laboratories of Beecham Foods Limited in London on quality control and on investigations of processing problems.

Dr. E. McC. Callan has been appointed to the Division of Entomology, where he will undertake the leadership of the Division's biological control programme. He graduated B.Sc. Manchester in 1932 and Ph.D. London in 1936. He also holds the qualifications of A.R.C.S. London, D.I.C. London, M.I.Biol., and F.R.E.S. During 1936-37 he was a research entomologist at Cambridge and from 1937-51 he was lecturer, later senior lecturer, in entomology at the Imperial College of Tropical Agriculture, Trinidad.

Since 1951 he has been senior lecturer in entomology at Rhodes University, Grahamstown, South Africa.

Mr. R. A. H. Morton, who recently obtained his Bachelor of Electrical Engineering at the University of Melbourne, has joined the Engineering Section,

Mr. R. A. H. MORTON

where he will carry out investigations into the uses of digital computers for engineering control and design. Mr. Morton worked for a short while with the English Electric Company.

Miss M. I. Vitolins has been appointed to the Division of Soils, where she will carry out work on the microbial nodulation of sulphur in Australian soils. After completing her science degree at the University of Adelaide in 1959, Miss Vitolins worked as a demonstrator in bacteriology for

Miss M. I. VITOLINS

medical and pharmacy students. During 1960-61 she was a research assistant at the University of South California and in 1962 she worked as a research assistant at the Lister Institute of Preventive Medicine in London.

Mr. C. R. Williamson has joined the Division of Soils. He will carry out fertilizer field experiments and chemical studies of soils with a view to developing methods for measuring fertilizer requirements throughout the wheat belt of New South Wales. An Agricultural Science graduate from the University of Sydney, he has spent the last two years working with the Soil Conservation Service of New South Wales.

Printed by C.S.I.R.O., Melbourne.

054##1963

CORESEARCH

FOR CIRCULATION AMONG MEMBERS OF C.S.I.R.O. STAFF — NUMBER 54, MELBOURNE, SEPTEMBER 1963

HORTICULTURAL RESEARCH SECTION OCT 1963

P.M. OPENS ORD DAM

The Chairman, Sir Frederick White, and Mr. C. S. Christian of the Executive, were among the crowd of six hundred people who watched the Prime Minister, Sir Robert Menzies, officially open the Ord River diversion dam in the far north of Western Australia on the 20th July.

The ceremony marked the completion of the first stage of a scheme to irrigate 200,000 acres of land in this isolated corner of Australia.

Sir Robert read a message from the Queen expressing her good wishes for the future of the Ord River project.

The message said that the Queen and the Duke of Edinburgh had the happiest memories of their visit to Kununurra last March and that they regarded the scheme as one of great importance for the economy of Western Australia and for that of the Commonwealth of Australia.

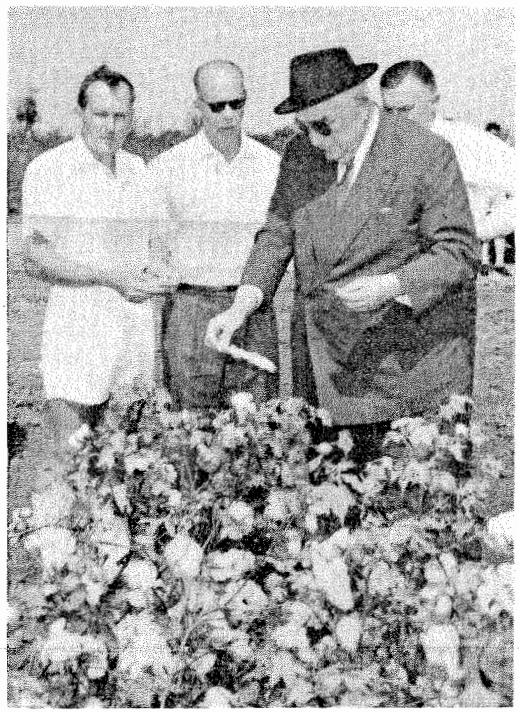
Referring to the work of C.S.I.R.O. and the Western Australian Department of Agriculture at the Kimberley Research Station he said, "It could not have been very easy for men of learning and qualifications to come and, as they might think, lose themselves in what was comparatively a desert, none of the amenities of life, isolated, sustained only by their tremendous skill and their burning enthusiasm".

Sir Robert went on to say, "Australia can produce more concentrated enthusiasm and skill and devotion to the appropriate task than any other country that I know, and I want to make my bow in the direction of those people who did the work without which we would not be here today and there would be no Ord Scheme at all".

He said that anyone who had gone through this country thirty years ago and talked of a great irrigation scheme beginning there in an established way by 1963 would have been told it was quite impossible.

However, the whole history of Australia was the history of the impossible becoming the possible, the possible becoming the probable, and the probable becoming the certainty, the living fact.

Sir Robert said that he had been particularly impressed by the magnificent crops he had seen and added, "I greatly enjoyed seeing these marvellous green stands of safflower until a very distinguished representative of the C.S.I.R.O. took occasion to say to me 'You ought to be interested in that, after all it's really just a thistle' ".



At the official dinner that evening the Prime Minister paid tribute to the work carried out by C.S.I.R.O. in the area and particularly to the part played by Mr. Christian as Chief of the Division of Land Research and Regional Survey and as Chairman of the Kimberley Research Station Policy Committee.

Our picture shows the Prime Minister, Sir Robert Menzies, inspecting a cotton crop at the Kimberley Research Station with cotton agronomist, Norm Thomson (left), of the Division of Land Research and Regional Survey, and Mr. C. S. Christian, member of the Executive.

David Rivett Medal

The C.S.I.R.O. Officers' Association has instituted a bronze medal, known as the David Rivett Medal, to honour the memory of the late Sir David Rivett, formerly Executive Officer and subsequently Chairman of the Council for Scientific and Industrial Research.

The medal will be awarded for outstanding research by members of the Organization's research staff.

The award will be offered every two years, alternate awards being intended for work in the biological and physical sciences.

It will be made for the first time in 1964, the chosen field being the biological sciences.

If the examiner considers that none of the candidates in the field for which the award is offered are of sufficient merit, the award will be withheld and the next award offered for work in the alternative field.

All officers under the age of 40 years at the time of the award are eligible to apply for the medal.

The period covered by the research is the ten years preceding the award; however, a substantial part of the work on which the award is based must have been carried out while the candidate was an officer of C.S.I.R.O.

Candidates for the award should submit their applications to the General Secretary of the C.S.I.R.O. Officers' Association, The Patch, Victoria, on or before the 31st December this year.

Submissions should include a statement of not more than one hundred words setting out in general terms the nature of the candidate's work, a list of the candidate's papers published or to be published in the ten years before the award, and copies of these papers.

APPOINTMENTS VACANT

The following vacancies for professional appointments are current:—

SCIENTIFIC SERVICES OFFICER (S.S.O. 1/2/3)—Computing Research Section, 900/4 (September 13th).

EXPERIMENTAL OFFICER (E.O. 1/2)—Division of Entomology. 180/224 (September 20th).

FELLOWSHIP IN METAL PHYSICS (R.O./S.R.O.)—Division of Tribophysics, 370/153 (September 6th).

RESEARCH OFFICER (R.O./S.R.O.)—Division of Physics. 770/257 (September 6th).

PASTURE AGRONOMIST (R.O./S.R.O.)—Division of Tropical Pastures. 850/194 (September 6th).

£16m. for C.S.I.R.O.

C.S.I.R.O. will have a total Budget for 1963/64 of £15,983,200 for capital and non-capital items.

A total of £12,406,000 will come directly from the Treasury, of which £10,600,000 is for non-capital expenditure.

The Treasury non-capital increase is, therefore, £1,218,000. Adjustments and unavoidable increases (including increments, the Experimental Officers' adjustments, and the increase in margins) will absorb £641,000, leaving £577,000 available for other non-capital purposes.

The Executive proposes to use this in the following way:

- To raise maintenance provisions to adequate levels.
- To allocate funds to some Divisions for items of equipment under £5,000. (Some major items have also been included in the capital vote.)
- To provide for increases in travelling expenses and overtime.
- To provide a special allocation for the Townsville and Computing Laboratories.
- To increase the funds for studentships and outside grants.

The Government decided that, in view of the present unsatisfactory accommodation situation, C.S.I.R.O. should not be granted any new Treasury positions for 1963/64, and further, that there should not be any increase in staff other than the filling of existing vacancies. This applies also to casual employees.

In view of the impending changes in the control of wool funds resulting from the new Wool Industry Act, 1962, the Executive decided when C.S.I.R.O.'s wool proposals were submitted to the Wool Research Committee, that no provision should be made for any expansion in the current research programme.

Consequently no new proposals were submitted and the Organization's estimates for Salaries and general running expenses were based on a small percentage increase over the 1962/63 Budget, after providing for the increases due to the Experimental Officers' award and the margins determination.

Money from other contributory funds has increased, permitting expansion in some fields.

Capital Vote

A total sum of £2,290,600 has been provided for capital works of which the Treasury will contribute £1,806,000.

The latter sum is divided into two categories—those projects controlled by C.S.I.R.O. and those handled by the Department of Works.

The first group, which includes development of the radiotelescope, the phytotron, small buildings constructed by C.S.I.R.O., major items of equipment (over £5,000 each) and scientific computing equipment, will absorb £564,000.

Two-thirds of the funds allocated for projects under the control of the Department of Works (£1,223,000) will be needed for buildings under construction.

These include the Chemical Physics Laboratory at Clayton, the Animal Genetics Laboratory at North Ryde, the Land Research and Regional Survey Laboratory at Canberra, the Technical Scale Laboratory for Coal Research at North Ryde, and the Horticultural Physiology Laboratory at Adelaide.

Major buildings to be commenced during 1963/64 include the Poultry Research Unit at North Ryde, the Pasture Research Laboratory at Townsville, the Computing Research Laboratory at Canberra, and extensions to the Cunningham Laboratory at St. Lucia.

C.S.I.R.O.'s request to the Wool Research Committee for funds for capital works was kept to a minimum.

Textile machinery, plant and developmental expenditure will absorb £124,000, leaving £187,600 for several building projects, including the completion of the Protein Chemistry Laboratory at Parkville and the acquisition of additional land at Armidale and Ryde, New South Wales.

The major capital project to be financed from contributory sources is the construction of a radio-heliograph at Narrabri, New South Wales, for the Division of Radiophysics.

This will be financed by a grant from the Ford Foundation.

Funds available to C.S.I.R.O. 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 to C.S.I.R.O. for 1962/63

	Non-Capital	Capital	Total
	£	£	£
Treasury funds	9,382,000	1,011,000	10,393,000
Wool funds	1,892,000	516,700	2,408,700
Contributions	807,700	53,000	860,700
Total	12,081,700	1,580,700	13,662,400

Funds available for 1963/64 compared with 1962/63

	Non-Capital	Capital	Total
	£	£	£
Treasury funds	1,218,000	795,000	2,013,000
Wool funds	254,700	—205,100	49,600
Contributions	138,200	120,000	258,200
Total	1,610,900	709,900	2,320,800

TAMING THE ORD

The Ord River, which carries more water in flood than the peak flows of the Rhine, the Rhone, and the Thames combined, is the foundation of a bold project for the closer population of Western Australia's northern Kimberleys region.

Two dams, one already in operation, the other which the State hopes will be completed by 1967, will hold back the waters which would otherwise spill out into the Timor Sea and divert them for the irrigation of tropical crops and the generation of cheap hydro-electric power.

Although the area had received attention at various times previously, the first real interest in the possibility of damming the Ord and using its waters for irrigation developed in the 1940's.

A soil survey by State officers with assistance from C.S.I.R.O. revealed 150,000 to 200,000 acres of land which seemed suitable for irrigation.

Subsequent studies by the Division of Land Research and Regional Survey confirmed an irrigable area of this size.

In 1946 the Kimberley Research Station was established as a joint venture between the Western Australian Department of Agriculture and C.S.I.R.O.

Research results soon indicated that the main crops suited for production in the area included sugar cane, rice, linseed, safflower, and cotton. However, as the sugar industry in Queensland and New South Wales was already producing adequate quantities of sugar, further research was concentrated on the other crops.

Experience so far indicates a reasonable expectation of yield of 2,500-3,000 lb. seed cotton per acre, 1½-2 tons of paddy rice per acre, 2,500-3,000 lb. of safflower per acre and 1,500-1,600 lb. of linseed per acre.

By 1960 the Western Australian Government felt confident enough of the potential of the area to warrant further trial by pilot farms.

An agreement was therefore made with Northern Developments (Ord River) Pty. Ltd. to conduct a pilot farm scheme in the area to relate the research findings of the Kimberley Research Station to actual farm practice and to assist in determining the economics of production.

Last year the first five farms were made available. These farms have an area of 600 acres each and are the first commercial ventures in the area apart from the Pilot Farm. More farms will be released progressively each year.

Four members of the Kimberley Research Station, including Don (Bondi) Beech, who was largely responsible for the Station's work on oil crops, joined together to take up one of these farms.

The central feature of the first stage of the Ord River project is the diversion dam, which was officially opened last July by the Prime Minister.

Three years ago the diversion dam site was a tangle of rocks. Today it is holding back 80,000 acre feet of water, the irrigation channels are running and the first large scale commercial cotton crops are due to be planted in the coming wet. The dam will provide water for 20,000-30,000 acres.

To the end of the construction stage this part of the scheme has been a complete success, reflecting the enthusiasm and know-how of the planners who turned it from a blueprint into reality.

Located at Bandicoot Bar, 65 miles by road from the port of Wyndham, the diversion dam consists of a wide concrete spillway structure with thin vertical piers supporting a two-lane roadway.

Each pair of piers forms an opening in which there is a steel radial control gate 49 feet wide, 37 feet high and weighing 95 tons. There are 20 such gates, each operated by electric hoisting gear located at the side of the bridge above.

When the river is in flood the hoists will lift the gates allowing the turbulent waters to rush between the piers. When the flow slackens, the gates will be lowered to conserve water and maintain the desired level for irrigation purposes.

At peak flow the Ord could fill the diversion dam in less than one hour.

All through the wet season, when the river is running, water will be diverted by gravity into a main channel, but during the dry season and until the main dam is built, it will be necessary to pump stored water from the diversion dam up into the channel.

When the main dam is built, however, water will be released down to the diversion dam to maintain the water level and pumping will no longer be necessary in the dry season.

The main dam is the next stage of the development of the Ord. It will be constructed thirty miles upstream from the diversion dam and will provide water for the remainder of the 200,000 acres.

It will create an artificial lake covering more than 200 square miles and holding 3,500,000 acre feet of water, more than seven times the volume in Sydney Harbour.

In addition, the main dam will have a flood control surcharge of 6,500,000 acre feet to store up peak flows and reduce floods downstream from the dam to less than half their previous intensity.

This will affect savings in the spillway at the main dam and will secure all the works at present under construction against future possible flood damage.

The main dam will trap the millions of tons of silt which otherwise may tend to choke up the diversion dam in time.

Extensive measures are being taken in catchment reclamation to reduce the annual wastage of topsoil and return eroded areas to their former state.

The main dam will incorporate a hydro-electric power station using water released for irrigation. It will feed power to Kununurra and later to Wyndham and its meatworks and to any minor undertakings that might develop in the area.

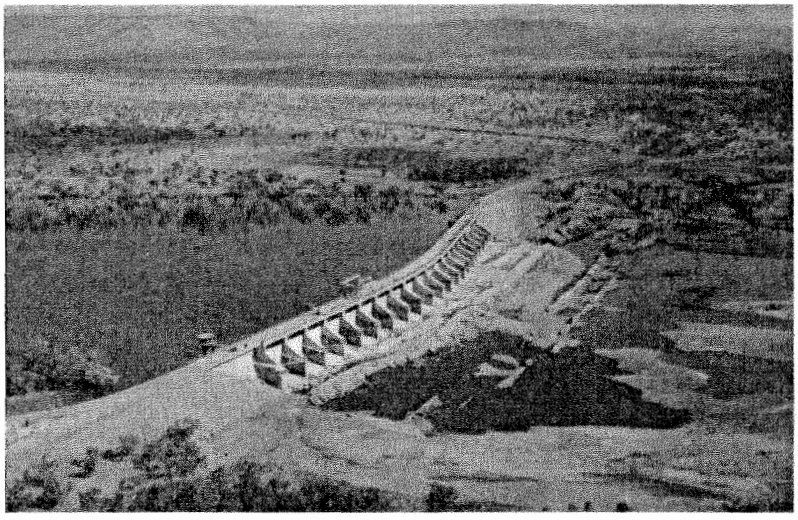
The design of the main dam is at present a concrete gravity structure 180 feet high and 1,000 feet long with a spillway over the top incorporating radial gates similar to the diversion dam.

Recent investigations have shown, however, that an earth and rockfill type of structure may be considerably cheaper in this remote area.

The spillway would be cut almost 200 feet deep in a saddle in the north abutment and the excavated rock and soil used to build the dam. Hydraulic model tests are being conducted to study the relative merits of the two proposals.

State authorities have estimated that the greater Ord River project can support a population of possibly 20,000 people directly and indirectly from agriculture.

It is a big step to visualize this as an industrial area, in its present undeveloped state, but there will be enough electricity to support several times this population and it is planned to encourage industrial development parallel with agriculture.



The Ord River diversion dam.

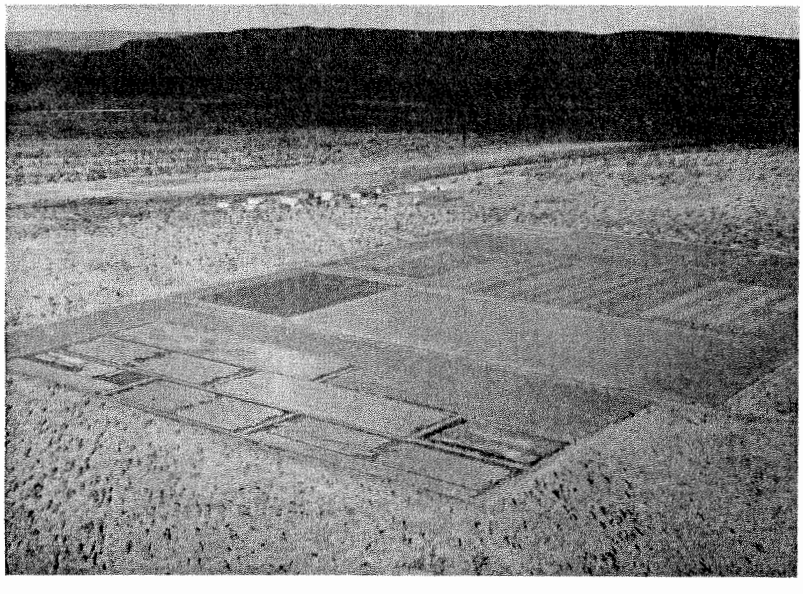
Natural resources and proximity to possible markets close by in South-East Asia are among the many incentives.

The new township of Kununurra has been developed initially for construction and administration purposes but has been carefully planned to meet the needs of a modern community of 3,000 people. It is intended to be a model town, providing amenities for pleasant living in the outback north of Australia.

Each house is supplied with a solar hot water system as part of its basic equipment — another example of the influence C.S.I.R.O. has had in the area.

As the general characteristics of the Ord River area are repeated at several places in northern Australia, development of the Ord Project represents an interesting and important experiment from the agricultural, engineering, and sociological points of view.

It is a necessary step in the understanding and development of the resources of Australia's virtually empty and under-developed dry monsoon northern fringe.



Aerial view of Kimberley Research Station.

TECHNICAL ASSOCIATION NEWS

Central Council met at the National Standards Laboratory on the 16th July and on the 23rd July.

Adelaide Meeting

A special meeting of technical staff was held in Adelaide on the 4th July. The South Australian Chairman, Noel Buckley, welcomed the General Secretary, Mr. W. Menzies, from Sydney.

Publishing Assistants' margins had been discussed at Head Office and the delay was due to the delay in the graphic arts award.

Juniors were not attached to any margins claim. It was moved that the matter of an increase in juniors' salaries be discussed with the High Council as a result of the recent margins increase.

Publishing Staff

It was moved that changes in the Constitution be made so that the publishing staff be deemed eligible for membership.

Memorial

The General Secretary reported that the Memorial for increases in salaries for technical staff was lodged with the Public Service Arbitrator on the 20th June.

General Business

A grant of £20, as authorised on 17th June, was sent to the Western Australian Branch.

Work Values

It was decided that a Council-in-Person meeting, followed by a meeting with the Secretariat, should be held after the decision on the A.A.E.S.D.A. case.

After consultation with Head Office, the General Secretary recommended that:

- The Association should await the decision from the A.A.E.S.D.A. case.
- Mr. Ross should be retained as advocate to assist in the completion of the work value survey.
- A levy should not be used at this stage.

OVERSEAS VISITS

Mr. K. F. Ball, of the Division of Meteorological Physics, will return to Australia later this month after a short visit to the United States, where he visited research centres in Chicago and attended the recent General Assembly of the International Union of Geodesy and Geophysics at Berkeley, California. He will attend an international symposium on the dynamics of large scale atmospheric processes at Boulder, California, early this month.

Mr. A. H. Brook, from the Division of Animal Physiology, left recently for Sweden, where he will spend twelve months with the Department of Physiology, Kungl, Veterinarhogskolan, Stockholm, studying the control of water metabolism by the central nervous system and the production and release of anti-diuretic hormone. Mr. Brook will then spend a further ten months working in this field at Western Reserve University, Cleveland, Ohio.

Mr. J. H. A. Butler, of the Division of Soils, left last July for the United States, where he will study for his Ph.D. at the University of Illinois under Professor Stevenson. He will be away for two years and will investigate the structure of soil organic matter.

Dr. B. Dawson, of the Division of Chemical Physics, will present a paper at the symposium on problems and methods in crystallographic computing which is being held in association with the 6th Congress of the International Union of Crystallography in Rome this month. Dr. Dawson will also visit centres engaged in X-ray structure analysis in Sweden, Britain and the United States.

Miss B. Doubleday, Chief Librarian, is at present on a three month visit to scientific and technological libraries in the United States, Britain, Europe, Israel, Pakistan and India. While overseas she will look at library buildings and their planning and will investigate the application of automatic data processing to library information problems. In America she will be an observer at a UNESCO-sponsored working party on the abstracting, indexing and editing of scientific papers.

Mr. R. V. Dunkle, of the Engineering Section, is now in the United States, where he will deliver a paper at a special jubilee meeting of the American Society of Mechanical Engineers in Boston. Mr. Dunkle will be away for about three months and will visit centres of solar energy research in the United States, Canada, the West Indies, Israel, India and Japan.

Dr. O. H. Frankel, member of the Executive, will attend the 11th International Congress of Genetics, which is being held at the Hague early this month. Dr. Frankel visited India and Britain on his way to Holland and will spend a few weeks in Britain before returning to Australia towards the end of next month.

Dr. M. C. Franklin, of the Division of Animal Physiology, will attend the World Conference on Animal Production in Rome early this month. He has spent the last fortnight visiting research institutes in Africa for discussions with research workers on the more efficient utilization of poor quality feed by cattle and on the value of supplements in beef production. Following the Rome conference, Dr. Franklin will visit a number of research centres in Europe, Great Britain, and the United States.

Mr. J. Fridrichsons, of the Division of Chemical Physics, will present a paper at the 6th Congress of the International Union of Crystallography in Rome this month. Mr. Fridrichsons will be away for two months and will visit research centres in Britain, Europe, Canada and the United States.

Mr. H. S. Hawkins, of the Agricultural Research Liaison Section, left last July for the United States, where he will study in the Department of General Communications Arts at Michigan State University. Before commencing his studies at Michigan Mr. Hawkins spent several weeks visiting university, government and commercial institutes engaged in agricultural extension and research.

Dr. F. E. Huelin, of the Division of Food Preservation, spent several days at the Central Food Technology Research Institute in Mysore, India, before attending the recent International Congress of Refrigeration at Munich, Germany. Early this month he will attend the Conference of European Meat Research Workers at Budapest, Hungary. Dr. Huelin will be away for about five months and will visit research centres in the United Kingdom, France, Holland, Sweden and the United States for discussions on food chemistry and the post-harvesting physiology of fresh fruits and vegetables.

Mr. L. F. Myers, Officer-in-Charge of the Division of Plant Industry's Regional Pastoral Laboratory at Deniliquin, and **Mr. J. W. Holmes,** of the Division of Soils, are on a six weeks visit to Thailand in connection with the Chao Phya Irrigation Project, which will eventually bring water to nearly 2,000,000 acres of land. Mr. Myers and Mr. Holmes have been asked to advise on the organization of a number of research stations to study the developments of secondary crops for the proposed irrigation area.

Dr. R. M. Oram, of the Division of Plant Industry, left for the United States last July, where he will spend approximately nine months at the University of California, working with Professor Allard in the Department of Agronomy. Dr. Oram visited the Grassland Research Division of the New Zealand D.S.I.R. and the University of Hawaii on his way to America.

Dr. C. H. B. Priestley, Chief of the Division of Meteorological Physics, attended the recent General Assembly of the International Union of Geodesy and Geophysics at Berkeley and will attend an international symposium on the dynamics of large scale atmosphere processes at Boulder, Colorado, early this month. Dr. Priestley will visit meteorological centres in the United States and Great Britain before returning to Australia.

Ian Clunies Ross Memorial Plaque

A memorial plaque to the late Sir Ian Clunies Ross has been mounted in the foyer of the Ian Clunies Ross Animal Research Laboratory at Prospect, N.S.W. The plaque is the work of Mrs. Yvonne Miller, a member of the laboratory staff.

Mrs. Y. MILLER

Cot for Babies Home

The Social Club of the Division of Textile Industry recently donated a baby's cot to the Bethany Babies' Home at Geelong, Victoria.

The cot is a self-contained unit and will be used for babies who will eventually be adopted.

Apart from normal social activities, the Club has raised a considerable sum of money for charity through special efforts, and more than £130 has been raised in the last year.

In addition to paying for the cot, this money has been used to provide a Christmas party for local orphanage children and to sponsor an orphan Indian girl, G. Meera, at the Seva Samajam Girls' Home, Adyah, through the Save the Children Fund.

Our picture shows the Chief of the Division, Dr. M. Lipson, presenting the cot on behalf of the Club to Matron L. M. Dodgshun. Two of the children from the home are shown — Susan in the cot and Zarena being held by Matron.

SOLAR SYMPOSIUM

A Solar Symposium entitled "Plans for the Next Solar Cycle" will be held in the Stephen Roberts Lecture Theatre, University of Sydney, from Tuesday, November 12th, to Friday, November 15th.

The Symposium, organized under the joint auspices of C.S.I.R.O. and the University of Sydney, aims at reviewing the present status of solar research, formulating outstanding problems, discussing research plans for the forthcoming solar cycle, and considering graduate training problems.

The occasion is intended primarily to provide an opportunity for Australian solar physicists, astrophysicists and others to meet and discuss their problems both in organized sessions and informally. Several overseas visitors, including Professor M. Minnaert, will be present.

Anyone wishing to attend should advise the Secretary, Mr. K. V. Sheridan, of the Division of Radiophysics, not later than September 30th.

BELLE OF THE BALL

Gael Boothroyd, a secretary at the Chemical Research Laboratories, was chosen Belle of the Ball at the Annual C.S.I.R.O. Ball in Melbourne on Thursday, 1st August. Gael is shown here receiving her sash from the Minister-in-Charge of C.S.I.R.O., Senator Gorton. The Ball was held at the Royale Ballroom, East Melbourne, and was attended by nearly six hundred.

BIG WIN FOR SOFTBALL TEAM

The Canberra Women's Softball Team recently held a cabaret to celebrate their win in the Public Service "B" Grade Competition. The Competition round commenced in May and was completed in August. C.S.I.R.O. managed to scrape up a team to enter the Competition, although only one or two girls had any idea about the rules and technicalities of softball. This year was the first that the girls contested softball, but they were playing brilliantly at the close of the season and deserved to win the honours. Success was due to the constant work and perseverance by coaches Ian Nordek and Laurie Laurence and, of course, to the co-operation and effort of the girls themselves. The Premiership was secured in a closely contested Grand Final with a narrow 14-13 victory over the Department of Army.

Our picture shows, from left to right:

Back Row: Anne De Vos, Helen Milthorpe, Virginia Stevenson, Helen Sugden, Norma McCaskill, Dorothy Scicluna, Heather Lamb.

Front Row: Margaret Tate, Helen Davies, Penelope Judson, Denise Coutts, Helen Coghlan.

Visitors from Overseas

Dr. C. J. Dawes is spending twelve months with the Section of Wood and Fibre Structure of the Division of Forest Products. Dr. Dawes is in Australia on a National Science

Dr. C. J. DAWES

Foundation post-doctoral fellowship and is engaged in the study of the fine structure of plant cells. He obtained his Ph.D. in the Botany Department of the University of California two years ago.

Dr. R. S. Roth, of the United States Bureau of Standards in Washington, will arrive in Australia this month to spend nine months with the Division of Mineral Chemistry

Dr. R. S. ROTH

studying the crystal chemistry of ternary oxides containing niobium. Dr. Roth has been with the Bureau since 1951 and is Head of the Phase Equilibrium Group of the Crystallographic Section in the Inorganic Solids Division. His major field of research has been in phase equilibrium relations and crystal chemistry of metal oxides.

Mr. T. Kamiko, Officer-in-Charge of the Weather Map Processing Sub-Section of the Forecast Department of the Japanese Meteorological Agency is at present spending twelve months working with the Division of Meteorological Physics. Mr. Kamiko, who was awarded a fellowship under the Australian International Award Scheme, is studying Australian synoptic sequences with special reference to frontal structure.

Dr. J. Ziman, a University Lecturer in Physics at the Cavendish Laboratory and a Fellow of King's College, Cambridge, is spending six months with the Division of Physics

Dr. J. ZIMAN

as a research fellow. Dr. Ziman is an expert in the theory of the solid state and his special interest is in the electrical properties of metals.

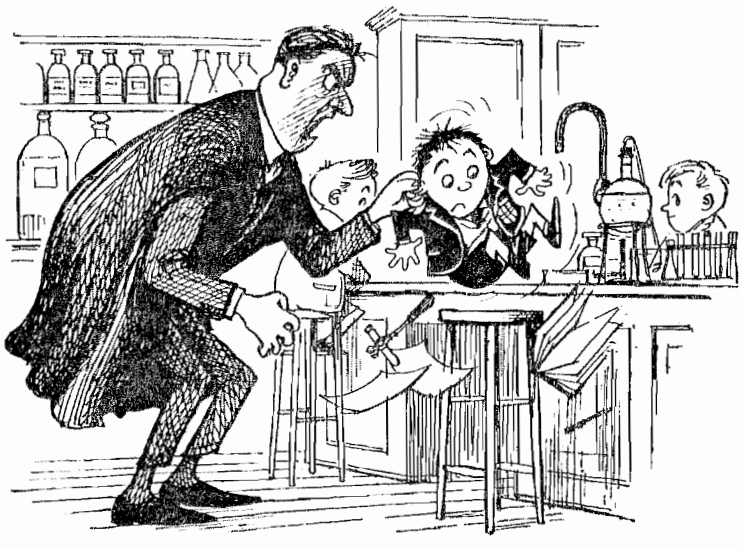
Appointments to Staff

Mr. K. R. Christian has been appointed to the Division of Plant Industry, where he will work with the Grassland Agronomy Section on the development and adaptation of chemical techniques in animal nutrition and pasture utilization. Mr. Christian, who obtained his B.Sc. in New Zealand, has been working as a biochemist with the Tasmanian Department of Agriculture for the last five years.

Dr. P. E. Madge has joined the Division of Land Research and Regional Survey and will study the ecology of insect pests of cotton at the Kimberley Research Station. Dr. Madge graduated B.Sc.Agr. from the California State Polytechnic College in 1948. He obtained his M.Sc.Agr. from the University of Adelaide in 1953 and his Ph.D. from the same University in 1956. From 1950 until 1956 he was a research fellow in entomology and then lecturer in entomology at the Waite Agricultural Research Institute, and from 1956 until 1960 he was research fellow in animal ecology in the Zoology Department of the University of Adelaide. During 1960 and 1961 Dr. Madge studied insect behaviour at the University of Cambridge on a post-doctoral fellowship awarded by the United States National Science Foundation. In 1961 he returned to his research fellowship in animal ecology at Adelaide to work on the ecology of insects and mites associated with pastures in the South Australian wheat belt.

Dr. D. V. McVean has been appointed to the Division of Plant Industry, where he will undertake a study of the ecology of skeleton weed. He graduated B.Sc.(Agric.) from Glasgow University in 1946 and received the National Diploma in Agriculture in the same year. In 1949 he graduated B.Sc. with first class honours in Botany from Glasgow University and in 1952 was awarded the degree of Ph.D. from Cambridge University. From 1946 until 1948 Dr. McVean was Colin Thomson Research Scholar at the West of Scotland Agricultural College, and from 1952 until 1959 he worked with the Edinburgh Nature Conservancy. In 1959 he became Ecologist in Charge of Mangla Watershed Management Study in West Pakistan with Hunting Technical Services Ltd., of London. Since 1961 he has been with the Nature Conservancy, Aviemore, Scotland.

Dr. H. R. Wallace has been appointed to the Horticultural Research Section, where he will undertake research on plant nematology. Dr. Wallace graduated B.Sc. in 1950 from the University of Liverpool, England, and obtained his Ph.D. and D.Sc. from the same University in 1952 and 1962 respectively. For the last four years he has been Deputy Head of the Nematology Department at Rothamstead Experimental Station.



"You shout 'eureka' just once more."

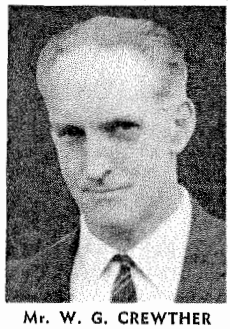
Copyright London Punch.

ASSISTANT CHIEF

Mr. W. G. Crewther has been appointed Assistant Chief of the Division of Protein Chemistry.

Mr. Crewther joined the Division of Industrial Chemistry in 1943 and was attached to its Biochemistry Section in Parkville. The Section subsequently developed into the Division of Protein Chemistry.

Mr. Crewther has worked on the mechanism of fermentation processes and enzyme action and in recent years his



Mr. W. G. CREWTHER

broad interests in protein structure have led him to investigations of the relationship between the molecular structure of wool keratin and its mechanical properties.

He has also played an important part in the Division's work on fellmongering, which led to the development of the skin digestion process, now widely used in the industry, and in the Division's research into methods of protecting wool from damage during carbonising to remove vegetable matter.

Printed by C.S.I.R.O., Melbourne.

055##1963

CORESEARCH

FOR CIRCULATION AMONG MEMBERS OF C.S.I.R.O. STAFF — NUMBER 55, MELBOURNE, OCTOBER 1963

AGRICULTURAL RESEARCH LIBRARY 7 OCT 1963 ABERDEEN

Radio Observatory for University of Sydney

The Division of Radiophysics is to transfer its radio-astronomy field station at Fleurs, thirty miles west of Sydney, to the University of Sydney.

The station, together with its aerial systems and radio receiving equipment, will be operated by the University's Department of Electrical Engineering.

This transfer follows the virtual completion by the Division of the programme of radio-astronomy observations for which the station was established.

The station will provide training facilities for graduate students and research opportunities for the Department's teaching staff.

The University will take over from the Division the regular radio mapping of the Sun's surface and the supplying of these maps to the International Astronomical Union.

The University also intends making full use of existing radio equipment and will build additional radio-telescopes for detailed studies of the Sun and the Galaxy.

The main radio-telescope at Fleurs, the Chris Cross, is named after the Head of the University's Department of Electrical Enginering, Professor W. N. Christiansen, who designed it while attached to the Division of Radiophysics.

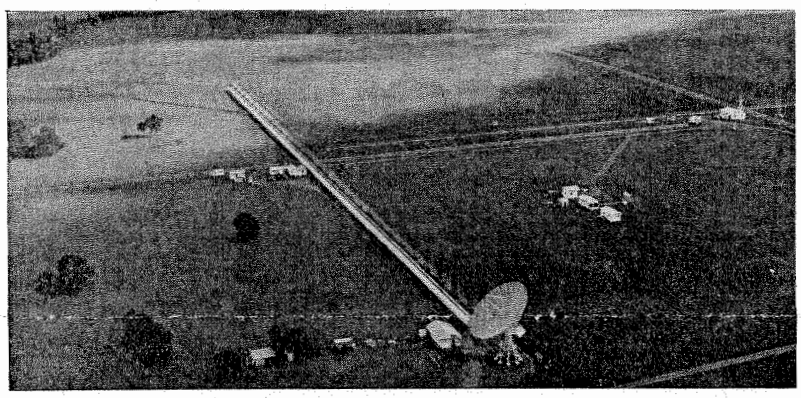
The Chris Cross consists of sixty-four parabolic antennae and was the first radio-telescope able to produce detailed "radio pictures" of the Sun's disk.

Its design has been copied in several countries but it is still the most highly directional radio-telescope at wavelengths up to twenty centimetres.

A number of additions to the Cross are planned to increase the amount of detail which can be "seen" in the sky.

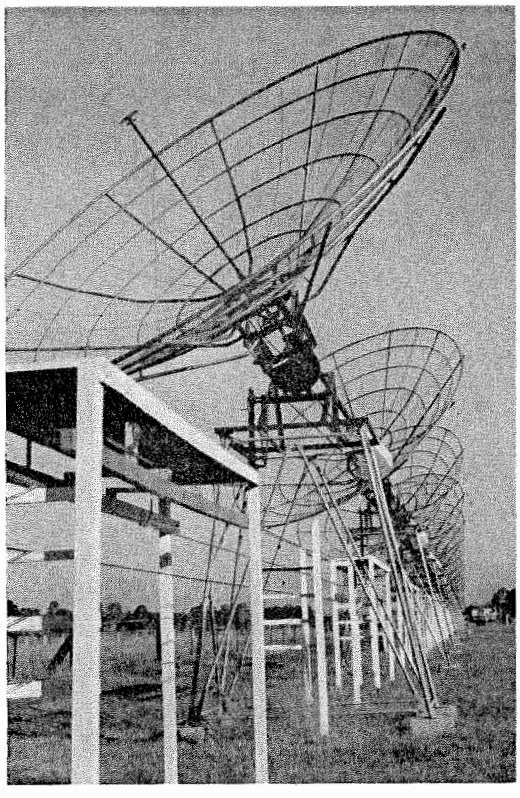
C.S.I.R.O. will make a grant to the University to assist the Department of Electrical Engineering during the first year of its work at the station.

The gift of the station, together with the grant, will help the University to cope with the increasing number of post-graduate students and teaching staff wishing to undertake research in electrical engineering.



Above: Aerial view of field station at Fleurs showing the Chris Cross (left) and the Mills Cross (right).

Below: Some of the 64 parabolic aerials of the Chris Cross. Each aerial is 19 feet across.



WATER SCIENTISTS MEET

The Prime Minister, Sir Robert Menzies, told delegates to the recent National Symposium on Water Resources, Use and Management in Canberra last month that the study of our water resources and the effective use of them were not only a matter of domestic advantage but also of international application.

Sir Robert said that Australians had a dry country and that they needed to increase their knowledge of their actual and potential water resources. Australia should do all it could to secure the most economic and productive use of these water resources.

About one hundred and fifty scientists, engineers, and administrators from all parts of Australia, as well as several visitors from overseas, took part in the week long symposium which was arranged by the Australian Academy of Science. A further one hundred people attended as observers.

Overseas visitors to the Symposium included Professor L. J. Tison, of Ghent University, Belgium, Secretary of the International Association of Scientific Hydrology and Unesco representative at the Symposium; Professor R. K. Linsley, head of the Department of Civil Engineering at Stanford University, California; Mr. M. S. Kohler, chief research hydrologist of the U.S. Weather Bureau; Mr. W. B. Langbein, hydraulic engineer of the U.S. Geological Survey; and Professor V. Kunin, of the Institute of Geography, Academy of Sciences, U.S.S.R.

Among the subjects discussed were the urban and industrial uses of water, management of stream flow, a review of data on the great artesian basin, automatic data processing in hydrology, the water balance and land use, the merits of irrigation, and problems of irrigated areas.

Dr. S. H. Bastow, member of the Executive and one of the C.S.I.R.O. delegates to the Symposium, spoke of C.S.I.R.O.'s contribution to water research in Australia.

He said that the Organisation had no water research laboratory.

Those of its scientists working on water were almost as widely dispersed as the C.S.I.R.O. laboratories themselves.

For instance, work on the evaporation of water was carried out by the Divisions of Chemical Engineering, Physical Chemistry, Food Preservation, Land Research and Regional Survey, Soils, Meteorological Physics, and Plant Industry and by the Irrigation Research Laboratory at Griffith.

It was therefore extremely difficult to give a precise figure for expenditure on water research in C.S.I.R.O.

However, a conservative estimate would be £350,000 a year, involving about fifty professionally qualified scientists.

Dr. Bastow said, "There is an urgent need in Australia for the support and development of special schools such as that of Professor Munro, through which young scientists and engineers could be attracted to the study of water and hydrology.

"Of the one hundred or so post-graduate student applications each year for C.S.I.R.O. scholarships it would be rare to find one interested in hydrology.

"In a very real sense research on water is limited by lack of trained scientists."

Professor R. R. Linsley said that one of the problems facing countries with water shortages in remote areas was whether to use the available water for industry or agriculture.

He said that a recent survey in New Mexico had shown that utilizing the meagre water resources for industry rather than agriculture was more profitable.

The financial return from industry per acre foot of water was seventy times that derived from agriculture.

Mr. Walter Langbein said, "We would like to centre the attention of the world on water science instead of water projects. If evaporation was reduced it would multiply the usefulness of water many times. One method of reducing evaporation is by eliminating useless plants."

Assistant Chief for Entomology

Dr. M. F. Day, one of the world's leading authorities on the transmission of plant and animal viruses by insects, has been appointed Assistant Chief of the Division of Entomology.

After graduating B.Sc. with honours at the University of Sydney, Dr. Day joined the Division of Economic Entomology of C.S.I.R. in 1938 to take part in the Division's research programme on termites.

A few months later he was granted leave to work with Dr. L. R. Cleveland at Harvard University where he subsequently obtained his Ph.D.

He resigned in 1940 to become Lehman Fellow at Harvard. During 1941-42 he lectured at Washington University, Missouri.

Dr. Day then spent a year with Australian War Supplies Procurement in Washington where he assisted with the purchase of scientific equipment.

In 1944 he rejoined the C.S.I.R. as a member of its Scientific Liaison staff in Washington.

In 1946 he returned to the Division of Entomology. In 1955 he was seconded for two years to act as Assistant Liaison Officer in Washington, and in 1956 he was elected a Fellow of the Australian Academy of Science.

Dr. M. F. DAY

APPOINTMENTS VACANT

The following vacancies for professional appointments are current:—

RESEARCH OFFICERS IN AGROSTOLOGY PLANT NUTRITION AND PASTURE EVALUATIONS (R.O./S.R.O.)—Division of Tropical Pastures. 659/16 (October 18)

RESEARCH OFFICER (R.O.)—Division of Coal Research. 480/428 (October 18)

PHYSICISTS OR ENGINEERS (R.O./S.R.O.)—Division of Applied Physics. 750/274 (October 11)

SENIOR MINERAL CHEMIST (P.R.O./S.P.R.O.)—Division of Mineral Chemistry. 601/20 (October 23)

RESEARCH CHEMIST (R.O./S.R.O.)—Division of Mineral Chemistry. 601/21 (October 23)

CHEMIST (E.O.1/2)—Division of Land Research and Regional Survey. 623/25 (October 18)

EXPERIMENTAL OFFICER (E.O. 1/2)—Division of Organic Chemistry. 606/42 (October 18)

VETERINARY PARASITOLOGIST (R.O.)—Division of Animal Health. 202/200 (October 18)

Ref 607(085.3)r.o AS(COR)

David Rivett Memorial Lecture

THE DEVELOPMENT OF MODERN SCIENCE

The vital need for well-endowed, systematic study of the sciences in the modern world was stressed recently by Sir Howard Florey, President of the Royal Society, when he gave the first David Rivett Memorial Lecture in the Wilson Hall, University of Melbourne, last month.

After paying personal tribute to the late Sir David Rivett, formerly Chief Executive Officer and subsequently Chairman of the Council for Scientific and Industrial Research, he went on to review the beginnings of systematic science among the Greeks, Arabs and Romans.

Science in its modern shape, he said, began with the Renaissance.

"The intellectual climate of the Renaissance was favourable to the exploration not only of the literary and artistic possibilities of human activity, but also to the investigation of natural phenomena in a way that we can call scientific.

"A few outstanding men of science such as Galileo made observations and generalisations of shattering implications which sometimes brought them ultimately into conflict with the ecclesiastical authorities.

"In general, however, none of the few scientists worked at that time in established schools, they had no pupils, and they were supported by no organizations with splendid resources — they were patronised by rich and enlightened rulers but their ideas spread slowly and many years passed before they gained acceptance.

"The beginning of the rise of modern science in Great Britain can be identified with certain events in the middle of the 17th century, and in no way is this clearer than in the foundation of the Royal Society.

"The original Fellows were a remarkable collection of men of outstanding intellectual ability. They were interested in acquiring scientific knowledge by observation and experiment.

"Some were professors of mathematics and astronomy, but by and large they were a band of amateurs. They decided to combine for discussion and, what is more important, for the performance of experiments and the making of demonstrations.

"It is generally agreed that the ancient universities of England were at a low ebb, but thanks partly to the inspiration of Newton the study and prestige of mathematics increased considerably, especially at Cambridge, where by the 19th century the Mathematical Tripos had established itself as one of the principal educational activities of the university.

"It was looked on not only as a preparation for the study of mathematics but as a suitable way of entering, surprisingly enough, the Church, the Law or politics. To do well in the Mathematical Tripos was to be a marked man.

"By the beginning of the 19th century Great Britain could fairly be said, against the background of contemporary European science and technology, to be doing well.

"The country was fortunate in possessing many of the raw materials, such as coal and iron, necessary for the industrial revolution that was to take place.

"To the contemporary politician and business man there could have seemed little to be worried about in the technological sphere, and only a few had any stirrings of social conscience at the consequences of industrialisation.

"Nevertheless, a good case can be made out that Great Britain's neglect to foster and organise science and technology on a sufficient scale in the 19th century has not been overcome even to this day.

"The Revolution enabled the French to sweep away their universities, and they were the first to establish a Government-supported scientific institution.

"It became known as the Ecole Polytechnique, and among its professors were nearly all the leading French savants of the beginning of the 19th century.

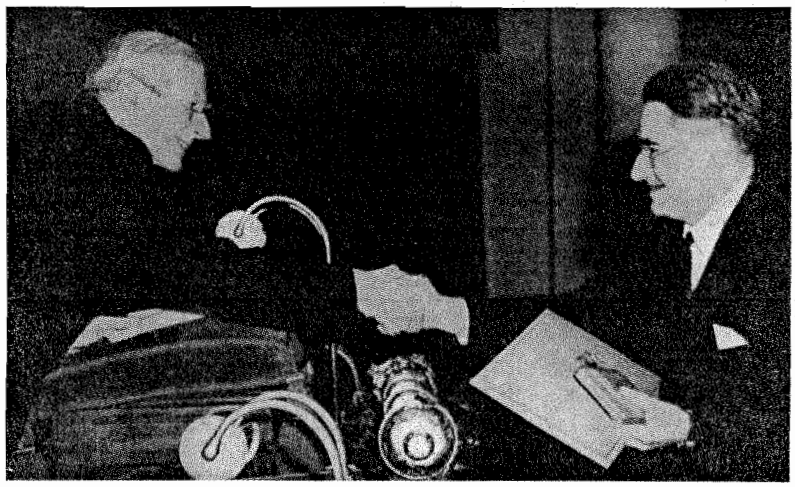
"The French had first rate scientists, and they started support of science by the Government in an enlightened way, but Napoleon made the mistake of uniting the entire higher educational system of France into one centralised so-called 'university'.

"This introduced great bureaucratic rigidity into the system, which undoubtedly hindered the development of French science.

"It is true that an illustrious institution, to be known as the Royal Institution, was founded in 1799 by Count Rumford and financed by private subscription.

"It was there that Faraday and Davy made their epoch-making discoveries, but it is a commentary on the times that, in spite of the contributions to science and technology which were made in its laboratories, Faraday in 1833 had the greatest difficulty in finding a few hundred pounds to enable the Institution to carry on, and this within two years of the momentous discovery of electrical induction.

"In spite of the resounding success of the Exhibition of 1851 there were not wanting powerful voices to predict that unless greater efforts were



Sir Howard Florey receiving from Lord Adrian, in 1951, the royal medal for his work on antibiotic drugs, in particular penicillin.

"The efforts of the Germans make a sharp contrast with what was accomplished in England. German education was re-organised at the beginning of the 19th century by von Humbolt.

"He saw to it that the universities, although they were State-supported, and their professors were State officials, retained a great measure of freedom.

"Much has been written about the undesirable features of the specialisation which the Germans introduced into their educational system, but there is little question that from the scientific and technological point of view they reaped rich rewards.

"The situation was radically different in Great Britain, where ideas on scientific education continued to be confined to a few people.

"In the middle of the 19th century James Hole remarked that, although much had been done, it had been done without system.

"He suggested that this was because 'an unreasonable jealousy of all interference of Government on the part of the people, and an almost utter indifference on the part of the Government itself to its own highest duties, have, in the past, prevailed'.

"The current individualism, to which almost automatically the adjective sturdy is usually applied, did not serve the cause of science and technology sufficiently well.

made the relatively favourable position of Great Britain as a manufacturing nation would decline.

"One of the major obstacles to the growth of science and technology was the totally inadequate educational system. Many of the ablest people were only semi-literate and those who attended ancient and famous schools had no contact with science at all.

"It is stated that at Eton in the early eighteen sixties there were twenty-four classical masters, eight mathematics masters and three to teach all the other subjects.

"Presumably the conditions have now somewhat altered but it is at least noteworthy that at the present time there is only one Etonian under seventy years old who is a Fellow of the Royal Society, and curiously enough he lives in Canberra.

"By the beginning of the 20th century a determined effort was made to establish at Imperial College, London, a technological institute comparable with those that had long been flourishing on the Continent and in the United States, but it is only comparatively recently that real impetus has been given to the intention.

"The principle that the State should support scientific activities because in the long run it is in the interests of the State to do so took a long while to establish itself, but at the present time in Great Britain the State is the main contributor to the teaching of science and technology, and for research both of a theoretical and applied nature."

Sir Howard Florey then went on to examine some of the trends in scientific and technological investigation with which science administration has to deal.

"Perhaps the most important general development of the past few hundred years," he said, "has been the demonstration of the immense power of controlled experiment to solve problems associated with the physical world at least.

"The momentum of discovery is ever increasing because of the use of this method, but it would be wrong to suppose that observation without planned experiment is now useless.

"From accumulating and correlating observations Darwin and Wallace arrived at conclusions which continue to orient biological thought and which were shattering for many theological conceptions.

"Much of astronomy is still observational although carried out with instruments of miraculous precision.

"No doubt many discoveries are still to be made by such methods, but it is to the experimentalists and their theoretical colleagues that the most exciting discoveries of the present day are due and to their development of apparatus that many of the great observations of today are indebted.

"Another point of general application is that experiments demand the making of measurements and that the measurements must become progressively finer — or to use modern jargon, more sophisticated — in order to continue to produce new knowledge.

"Significant observations are only made with adequate instrumentation. And adequate instrumentation may involve the solution of intricate engineering problems and the expenditure of very large sums of money.

"But it is not my intention now to detail remarkable achievements in various branches of science, but to make the point that progress in acquiring knowledge depends on progress in devising subtler and more accurate methods of experiment.

"This frequently means acquiring costly and often bulky machines.

"It is because of these developments, just as much as because of an increase in the number of scientists, that organization on a great scale is now necessary. The demand for scientists to use the apparatus is also increasing to be sure — a case of the hen and egg perhaps.

"In an ideal world populated by ideal people it should not matter much whether a discovery is made in Melbourne or Peking, in Timbuktu or in Oshkosh, but we live in a highly competitive world and this is being borne in upon Great Britain with increasing force.

"The countries of Europe and North America are now highly industrialised and they are all struggling to have a surplus of exports over imports — indeed this seems to be the ideal of every State, though precisely how this is to be achieved I have yet to be told.

"There can be little doubt that an increasing effect of the relative past backwardness of scientific and technological development in Great Britain is now being felt and recognised, because with the dissolution of a great empire and the increasing industrialisation of many countries factors which hitherto obscured lack of competitive power are now removed."

Sir Howard Florey described the role of the universities and academies in the furtherance of scientific education and research.

He then returned to the subject of Sir David Rivett and his influence on science in Australia.

"Rivett, in whose honour this lectureship has been founded, was the scientific administrator to whom Australia will always be grateful.

"At a time when, at least to the outside world, the Australian universities appeared to be weak, he built up a strong organization in which the ideal was upheld that only the best scientific work would do in both fundamental investigations, and by that I mean those not likely to be immediately profitable, and in those more directly applied.

"There is little doubt that but for Rivett Australian science would not hold the honoured place it now does in the judgment of the scientific world.

"He worked in an environment every bit as difficult as that which I have sketched as having prevailed in Great Britain for at least a century.

"May Australia be fortunate in finding many Rivetts in the present and the future, for there can be no doubt that successful scientific research and development will depend not only on those who do it, but on those who organise the means by which it is done."

Overseas Visits

Dr. J. F. Brotchie of the Division of Building Research arrived in America recently where he will spend twelve months studying the uses of electronic computation in the optimisation of structures at the Massachusetts Institute of Technology and Harvard University.

Dr. H. E. Dadswell, Chief of the Division of Forest Products will return shortly from a visit to Canada and the United States. While overseas he attended the first Canadian Wood Chemistry Symposium at Toronto and acted as chairman of a working group on wood quality at a meeting of the International Union of Forest Research Organizations in Madison. Dr. Dadswell also attended the Fifth F.A.O. Wood Technology Conference at Madison which was attended by Senior Government delegates in forest products from various countries.

Mr. W. B. Hall of the Division of Mathematical Statistics left recently for India where he will spend nine months working on physical and biological aspects of experimental design. Mr. Hall obtained a scholarship under the Technical Co-operation Scheme of the Colombo Plan and will study at the International Statistical Education Centre, Calcutta.

Mr. G. Lorenz of the Division of Applied Physics left Australia last August to attend the Cincinnati-Pittsburgh Conference of the International Institution for Production Engineering Research (C.I.R.P.). He will visit a number of research institutions in U.S.A. before returning later this month.

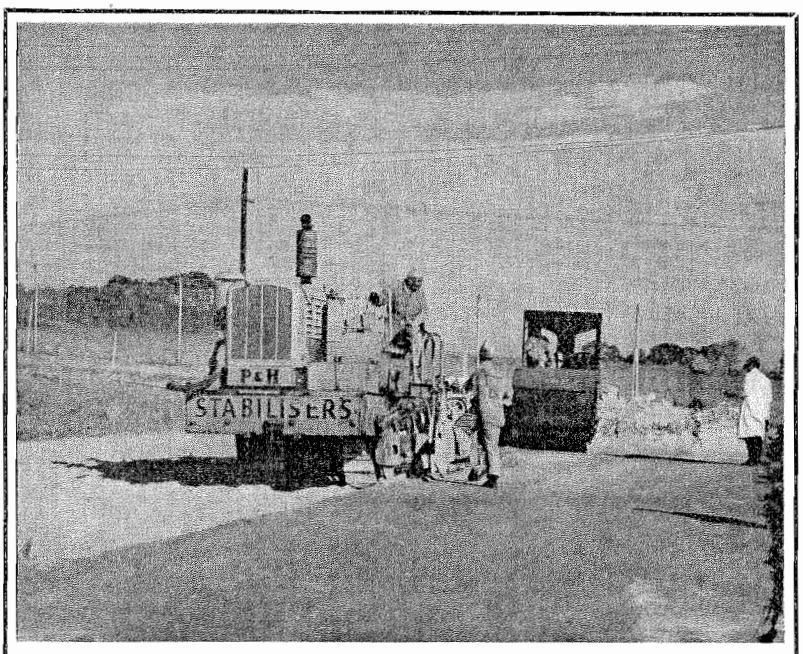
Dr. D. F. Martyn, Officer in Charge of the Upper Atmosphere Section returned recently from Geneva where he presided over a three weeks session of the United Nations Scientific and Technological Committee on the peaceful uses of outer space. While overseas Dr. Martyn attended the Warsaw Assembly COSPAR (Committee of Space Research of the International Council of Scientific Unions) as chief Australian delegate. He later visited Moscow where he delivered a series of lectures on the upper atmosphere as guest of the Presidium of the Soviet Academy of Science.

Mr. J. F. Nicholas of the Division of Tribophysics attended the recent 6th General Assembly and Congress of the International Union of Crystallography in Rome. He also attended the meeting of the International Union of Pure and Applied Physics in Warsaw acting as the official Australian delegate on behalf of the Australian Academy of Science. Mr. Nicholas will spend three months in the Metallurgy Department of the University of Oxford to acquire further knowledge of the methods used in studying the electrical theory of solids before returning.

Mr. M. R. Sauer of the Horticultural Research Section has taken up a studentship in the Department of Nematology at the University of California where he will study the taxonomy, comparative morphology and pathogenicity of nematodes, and methods of nematode control.

Mr. J. P. Shelton of the Industrial Research Liaison Section is at present on a seven week visit to Japan, the United States, Britain and South Africa. While overseas he will have discussions on licensing of C.S.I.R.O. patents and will study arrangements for promoting the application of research results by industry.

Dr. D. B. Williams, Officer in Charge of the Agricultural Research Liaison Section is on a three month visit to the United Kingdom, Europe and North America where he will study the latest trends in agricultural extension methods. He will spend about six weeks visiting various research centres in the United Kingdom and Europe before going to the United States.



Stabilizing Soft Building Sites

Building sites on soft clayey soils often present a number of problems during wet weather. One means of providing a firm, all-weather work surface is to stabilize the soil with hydrated lime. Although this technique was developed overseas the Soil Mechanics Section has been interested in investigating some of its fundamental aspects.

The construction of a new laboratory for the Section in the Melbourne suburb of Syndal last year provided an opportunity of demonstrating the value of soil stabilization. The top soil was removed and the clay sub-soil mixed with about 4% of hydrated lime using one of the larger types of commercially available mixers. A steel wheeled roller was then used to compact the stabilized layer. A total area of some 1300 square yards was completely processed, rolled and graded to finished condition in less than five hours.

The addition of lime changes the properties of the clay so that particles adhere strongly to each other giving the surface layer a greatly increased bearing capacity even in wet conditions. Because of the greatly improved surface no vehicles were bogged on the site and speed of delivery of building materials was maintained, making it possible to maintain construction schedules whatever the weather conditions.

The Film Unit recently completed a 16 mm., sound, colour film lasting nine and a half minutes to show the building industry the advantages of soil stabilization on soft sites.

ROYAL SOCIETY VISITOR

Dr. D. C. Martin, Executive Secretary of the Royal Society left for England recently after a four week visit to Australia.

During his stay, Dr. Martin visited C.S.I.R.O. laboratories, universities, and other research centres in Sydney, Melbourne, Adelaide and Canberra.
He also visited Broken Hill, the radiotelescope at Parkes, the Woomera Rocket Range, and the Snowy Mountains Scheme.

Dr. Martin became Assistant Secretary of the Royal Society in 1947 where his enthusiasm for scientific liaison within the Commonwealth developed rapidly.

His position involves him as Secretary of about one hundred committees of the Royal Society.

On top of this he is also concerned from time to time with special major undertakings.

One of these was the International Geophysical Year which was organized through the International Council of Scientific Unions with which the Society has close links.

The Royal Society was also responsible for the major British expedition to Antarctica and is actively concerned with the sub-committee on Antarctic Research which is the international continuation of the I.G.Y. in this field.

Dr. Martin was awarded a C.B.E. in 1959.

Overseas Liaison Posts

Mr. P. F. Butler, Chief Scientific Liaison Officer in London will return to Australia early next year and will be succeeded by Mr. W. Hartley, who is at present Australia Scientific Attache in Washington.

Mr. Hartley will take up his new position late next month and wil be assisted by Mr. J. I. Platt, formerly Divisional Administrative Officer of the Division of Textile Physics.
The Washington post will be filled by Mr. C. S. Elliot, Assistant Chief of the Division of Forest Products, who will leave Australia for the United States later this month.

The Washington appointment is for two years and at the end of this time Mr. Elliot will retire.

Mr. Elliot joined the Division of Forest Products in 1930 to carry out research in the Timber Seasoning Section and became Officer in Charge of the Section in 1932.

Ten years later he transferred his activities to full time administrative work and in 1944

Mr. C. S. ELLIOT

he was appointed Assistant Chief of the Division.

Microbiologist Retires

Mr. E. J. Ferguson Wood of the Division of Fisheries and Oceanography retired last month after twenty-six years' service with the Organization.
Mr. Ferguson Wood graduated M.Sc. from the University of Queensland in 1929 and obtained a B.A. degree from the same University in 1932.

He joined C.S.I.R. in 1937, being one of the first officers appointed to the Division of Fisheries, where he undertook research on bacterial spoilage of fish.

Mr. Ferguson Wood helped institute the vitamin-oil industry based on school shark and played an important part in the foundation of the agar industry in Australia.

During the last fifteen years he has carried out research on various aspects of marine microbiology and has produced a handbook on Australian forms of phytoplankton.

He worked as visiting investigator at the Scripps Institute of Oceanography, University of California, on a Rockefeller grant, in 1954, and as visiting Professor at Texas A. and M. College in 1961.

HONOUR

Dr. D. B. Williams, Officer in Charge of the Agricultural Research Liaison Section, has been elected a Fellow of the Australian Institute of Agricultural Science for his contribution to the development of agricultural economics in Australia.

TECHNICAL ASSOCIATION NEWS

It has become increasingly obvious recently that there are groups of Technical Staff who are not represented on the Branch committees.

One or two of these groups have a small percentage of financial members in the Association, but, probably because of insufficient publicity of the Association's activities, the majority have not become members.
Fortunately this is restricted to only one or two sections. On the other hand, there are places such as Field Stations and Regional Laboratories where definite continual contact has not been established and there are no financial members to keep informed of the Association's activities and progress.

No doubt many of the Technical Staff concerned would join if this direct contact could be established.

Central Council will be conducting a campaign, together with the Branches, to establish contact with eligible groups who are not members, with the idea of recruiting these people to membership of the Association.

This can be done quite satisfactorily if at least one person in each Station or Laboratory can accept the responsibility of distributing the information received from the respective Branches and Council and circulate the contents amongst other members.

Some of the places where this might be done, for example, are Griffith, Armidale, Rockhampton, Alice Springs, Hobart, Kimberley, Katherine and Darwin.

In the meantime, anyone interested is asked to contact the General Secretary, C.S.I.R.O.T.A., C/- P.O. Box 144, Parramatta, N.S.W.

Council's delay in dealing with this matter is due to preparation for our Salary claim and our next meeting in Melbourne followed by a meeting with the Secretariat.

Adult Fees.

Central Council has now adopted a policy of pressing a case for reimbursement of fees for adults attending recognised courses.

However, a considerable amount of reliable information is needed and all adult members who are involved are asked to contact their Divisional delegates with information on the following: type of course, estimated number of years before completion, fees per year, estimated total cost of the course, grade and step in grade during the course, married or single whilst attending, age, number of years with C.S.I.R.O.

The sooner Council obtains this information, the sooner a case can be presented to the Secretariat.

Interstate Conferences

Equipment used by the Soil Mechanics Section for undisturbed sampling of soil created great interest among the two hundred delegates to the Fourth Australian-New Zealand Conference on Soil Mechanics and Foundation Engineering, which was held at the University of Adelaide from 19th to 23rd August.

The Conference was sponsored by the Institution of Engineers, Australia, the New Zealand Institution of Engineers, and the Australian and New Zealand Societies for Soil Mechanics and Foundation Engineering.

The Chairman was Dr. G. D. Aitchison, Officer-in-Charge of the Soil Mechanics Section.

Some forty papers were presented dealing with research advances in the mechanics, physics, and chemistry of soils, and in their application to a variety of civil engineering projects.

Delegates inspected the laboratories of the Division of Soils and were shown an exhibit of the work of the Soil Mechanics Section on soil fabric, evaluation of terrain for engineering land use, building foundations, and water retention in earth dams.

More than one hundred delegates attended the Second Australian Fruit Research Conference which was held at Orange and Terrigal, New South Wales, from 21st to 28th August.

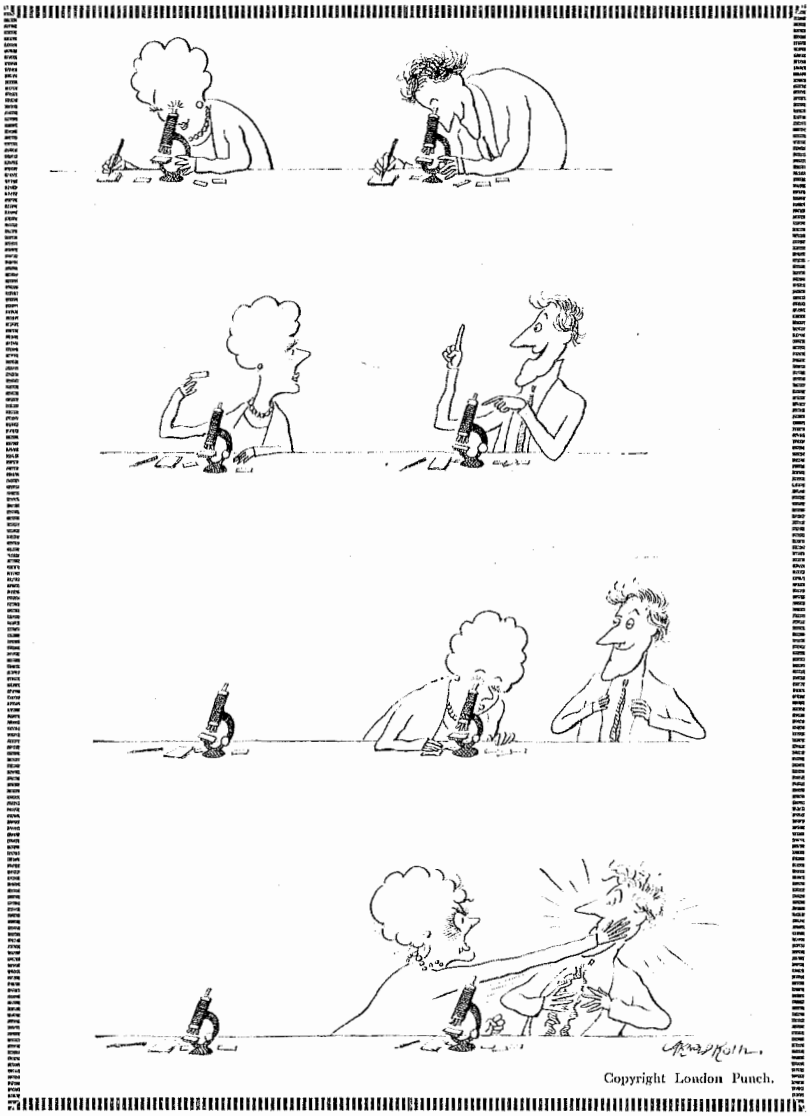
Among the delegates were Dr. L. C. Luckwill of the Long Ashton Research Station, University of Bristol, England; Professor C. A. Shroeder, Professor of Botany at the University of California, and Mr. J. D. Atkinson, of the D.S.I.R., New Zealand.

The aim of the Conference was to reveal the gaps in our knowledge of horticultural crops and to show where future research should be intensified.

Some seventy papers were presented dealing with recent progress in horticultural research, training of research workers, experimental methodology in horticulture, nitrogen in tree nutrition, fruit quality, fruit handling, physiology of vegetative and reproductive growth, and toxicity of sprays to pests and humans.

During the Conference visits were arranged to neighbouring research stations and experimental orchards, and local fruitgrowers' organizations at Orange organised a special barbecue for the delegates.

The Conference was convened by the Agricultural Research Liaison Section at the invitation of the Standing Committee of Agriculture and was organized by a committee of representatives of State Agricultural Departments under the chairmanship of Mr. B. Owen French of the N.S.W. Department of Agriculture.



Copyright London Punch.

APPOINTMENTS TO STAFF

Dr. W. N. Arnold has been appointed to the Horticultural Research Section and is working at the Section's new Laboratory in Adelaide. He is studying the enzyme systems involved in the metabolism of carbohydrates and the accumulation of sugars in grapes. Dr. Arnold graduated B.Sc. from the University of

Dr. W. N. ARNOLD

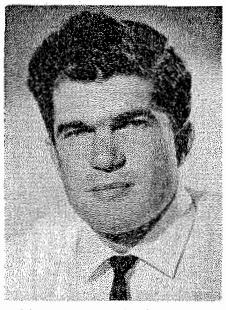
Queensland in 1956, M.A. from the University of California in 1958, and Ph.D. from Cornell University in 1962. From 1957 to 1958 Dr. Arnold worked at the Citrus Experimental Station of the University of California on air pollution and then on plant virology.

Mr. N. Fourikis has joined the Division of Radiophysics where he will assist in the development, installation and testing of advanced receiving equipment for radio-astronomy work. He was born in Cairo and came to Australia in 1957. In 1960 he obtained a Diploma in Radio Enginering from the Royal Melbourne Institute of Technology and was then employed by HSV7 investigating the basic requirements of film recording of live television shows. His previous position was with Amalgamated Wireless Australasia, where he worked in the microwave links section.

Dr. J. L. Madden has joined the Division of Entomology and will work at the Regional Laboratory, Hobart, investigating the ecology and behaviour of the Sirex wood wasp. He graduated B.Agr.Sc., Melbourne, 1957, M.Sc., Cornell, 1961, and holds Cornell's Ph.D. degree. His doctoral thesis was on insect population dynamics. Before visiting the United States Dr. Madden was a horticultural officer with the Tasmanian Department of Agriculture.

Mr. I. W. Smith has been appointed to the Division of Coal Research, Ryde. He will assist in basic investigations and development work leading to the design of experimental plant to be used for the complete gasification of coal. Mr. Smith is a graduate member of the Institution of Chemical Engineers and an associate member of the Institute of Fuel. From 1957 he has worked with the British Coal Utilization Research Association, being concerned with pilot studies on oxy-steam gasification of coal.

Mr. R. H. Batchelor has joined the Division of Radiophysics, where his work will be connected with the development, installation and testing of equipment used in radio-

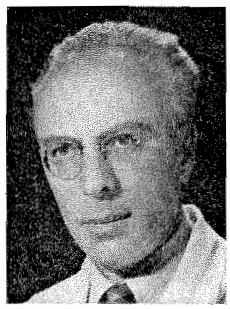


Mr. R. H. BATCHELOR

astronomy. Mr. Batchelor obtained his Diploma of Radio Engineering in 1959, and was awarded the Fiske Memorial prize. He then studied for the B.E.E. degree at the University of New South Wales, and graduated with Honours in 1961. Mr. Batchelor is a former employee of Kriesler Australasia Pty. Ltd., and his interests include music and surf lifesaving.

Dr. J. Keay has been appointed to the Division of Soils and will work at the Western Australian Regional Laboratory, Perth, on the development of research projects relating to pedology and fertility in Western Australian soils. Dr. Keay graduated B.Sc. (Hons.) from the University of Leeds in 1957 and Ph.D. from the University of Reading in 1960. After completing his doctoral degree Dr. Keay was with the Macaulay Institue for Soil Research, Aberdeen, and was latterly acting head of the Forest Soil Section. His more recent work included an investigation of the sulphur nutrition of conifer seedlings.

Mr. A. W. Billitzer has been appointed to the Division of Biochemistry and General Nutrition to assist in fundamental research on the chemistry of carbohydrate compounds. He is a native of Vienna and obtained his M.Sc. degree in Adelaide in 1952.



Mr. A. W. BILLITZER

Mr. Billitzer previously worked with Beckers, manufacturing chemists of Adelaide, as a research and development chemist. He has had wide experience in the synthesis and separation of organic compounds, and is fluent in several foreign languages.

Dr. R. J. Tatchell has been appointed to the Division of Entomology, Brisbane, to study the physiology of the cattle tick. He is formerly of the Molteno Institute of Biology and Parasitology, University of Cambridge, which he joined in 1956, and has lately been working on the physiology of feeding and reproduction in ticks. He graduated B.Sc. (Hons.), University of London, in 1953, and Ph.D., University of Cambridge in 1959. En route to Australia Dr. Tatchell attended the XVIth International Congress of Zoology, Washington, and 1st International Conference of Acarology, Denver, U.S.A.

Mr. D. J. Williams, a former employee of the Tin Research Institute, Middlesex, has been appointed to the Division of Coal Research. He has previously worked in the field of organometallic compounds, and will now take part in investigations into the kinetics and oxidation of sulphur dioxide in the gaseous phase. Mr. Williams graduated B.Sc. (Hons.) from the University of London in 1957. He is keenly interested in both sailing and theatre.

Miss P. F. Riches has been appointed to the Division of Radiophysics where she will work on the analysis of cloud seeding experiments and assist in their interpretation. She graduated B.Sc. from the University of Queensland in 1959,

Miss P. F. RICHES

and then taught mathematics at Presbyterian Girls' College, Warwick, Queensland for two years. Miss Riches travelled to Britain in 1961 and worked for two years with the Hill Farming Research Organization, Edinburgh.

Printed by C.S.I.R.O., Melbourne.

056##1963

CORESEARCH

FOR CIRCULATION AMONG MEMBERS OF CSIRO STAFF — NUMBER 56, MELBOURNE, NOVEMBER 1963

SENATE DEBATE ON CSIRO ESTIMATES

On the 25th September the Senate debated the 1963-64 estimates for CSIRO. Several Senators spoke on the estimates and various questions arising from the debate were answered by the Minister in Charge of CSIRO, Senator Gorton.

Senator Murphy (New South Wales) said that Australians were justly proud of CSIRO.

Its work was recognized not only in Australia but also abroad as being of very high quality.

Senator Murphy drew attention to the small number of new research positions which had been approved for 1963-64.

He said, "In 1962-63 the number of research officers was 1,021, while in 1963-64 the number is to be 1,029, an increase of eight research officers or less than 1 per cent. in a year.

"This does not seem justifiable when one looks at the increase in population, the need for development in both primary and secondary industry, and the notorious lack of scientific research being conducted in the country."

He then referred to a statement made by a member of CSIRO that the amount of research conducted in Australia was far less than it should be and that the amount spent by Australian industry on research and development was only about one-tenth of the fraction of gross national product that was spent in the U.S.A.

Senator Murphy said that the estimate for CSIRO appeared to be a gross under-estimate. Not enough was being ex pended. The appropriation should have been much more.

During his speech Senator Murphy also drew attention to the apparent under-spending by CSIRO of £324,000 on investigations during 1962-63.

The reasons for this apparent discrepancy were explained later by Senator Gorton.

In actual fact CSIRO under-spent Treasury funds by only £7,235 during 1962-63. This represents an expenditure of 99.9 per cent. of the funds available, a fact of which Head Office Finance Branch is extremely proud.

Senator Scott (Western Australia) said, "I believe that the CSIRO is to be commended by everybody in Australia for the excellent work that it has done since its inception in 1949.

"The CSIRO should be congratulated, too, on its advocacy of the use of a disease which has ousted the rabbit from Australia and has allowed us to increase our sheep population during the last twelve years by more than 50,000,000.

"Because of it, revenue from the sale of wool has increased by approximately £130,000,000 a year, yet in the estimates we find that the amount which it is proposed to allocate for the Organization this year is only £10,600,000."

He continued, "I believe that the CSIRO has played a significant part in helping to provide the information that is necessary for the development of our northern areas."

Senator Scott then spoke of the work of CSIRO which he had seen in Northern Australia.

He concluded, "I don't want to let this opportunity pass without congratulating the Chairman, Secretary, officers, technicians and staff of this great organization whose services are available to industry and agriculture in Australia.

The discoveries that CSIRO has made have paid dividends amounting to ten times the money that has been spent."

Senator O'Byrne (Tasmania) referred to the work of CSIRO in seeking solutions to problems concerning various companies or interests.

He said he felt that as CSIRO was working on limited funds it should receive assistance not only from the Government but also from other organizations which benefited considerably as a result of the investigations of CSIRO scientists into their problems.

Senator Laught (South Australia) said that the latest Annual Report of CSIRO was by far its best and he hoped that more publicity would be given to the Annual Reports in future.

He said he had been particularly impressed by the practical note struck in the chapter entitled "Progress in Research."

He said, "I fear that not enough publicity has been given to these matters of great commercial importance to all phases of Australia's primary and secondary industry development.

"In the Government's view, which I believe is a view shared by most people who examine this field in relation to all other fields, the amount voted for this Organization is a fairly reasonable yearly advance."

"I do not think that enough emphasis is placed by the public on the work which CSIRO is doing. We in the Senate should pay tribute to the Organization. I commend to honourable senators a close examination of its Annual Report."

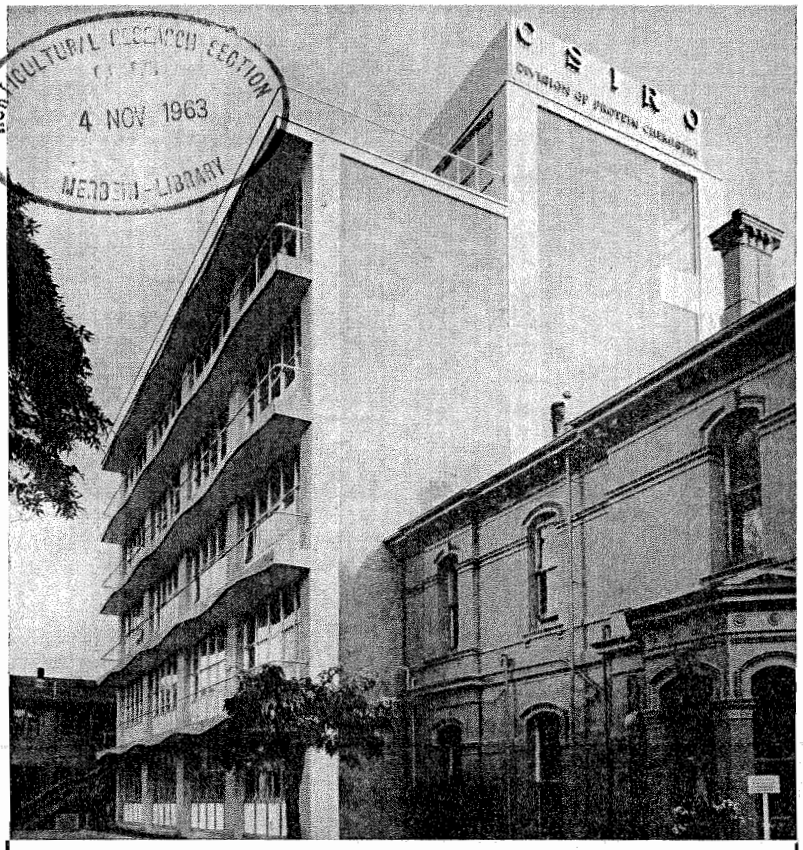
Senator Gorton answered a number of questions raised by the other Senators.

He said, "I don't think that now, at any stage in the past or at any stage in the future the scientists of the CSIRO would say that they were happy that they had been provided with sufficient funds to have a sufficient number of people to do all the research in all the fields that they would like to cover.

"However, I point out that the overall vote from Treasury funds for the Organization this year has been increased by about 20 per cent, that is, from about £10 million to £12 million.

"I mention also that there is a limitation on the amount that can be made available for any particular field, whether it be research or any part of research.

NEW WOOL LABORATORY



HORTICULTURAL RESEARCH SECTION
4 NOV 1963
MERBEIN - LIBRARY

On the 25th October the Minister in Charge of CSIRO, Senator Gorton, opened a new five-storey laboratory block for the Division of Protein Chemistry in the Melbourne suburb of Parkville. The laboratory was designed by the architectural firm of Romberg and Boyd and was built at a cost of approximately £291,000 of which £226,000 was provided from the Wool Research Trust Fund. For the last eleven years the Division has been accommodated at the present site in two converted houses and a two-storey building. The new block will provide more than 29,000 square feet of floor space. The ground floor will house physical chemistry equipment and there will be a library, staff room, and lecture room on the first floor. There are biochemical laboratories on the second floor and organic chemistry laboratories on the third floor. The fourth floor will be used for research on the proteins collagen and myosin and on other protein investigations not financed from the Wool Research Trust Fund.

Overseas Appointment

Mr. A. J. Vasey, Technical Secretary of the Division of Animal Health, has been seconded to the post of Executive Secretary of the British Commonwealth Scientific Committee.

The Committee consists of the heads of national scientific research organizations and meets every two years to discuss problems of mutual interest.

Mr. A. J. VASEY

The Committee decided that it would be desirable to have a full-time Secretary not only to administer its affairs but also to act as liaison officer between the various national bodies and in particular to be available to help developing Commonwealth countries obtain advice on building up their scientific institutions.

Mr. Vasey will sail for England with his wife and family next January to take up his duties in London in March. He will occupy the post of Executive Secretary for three years.

After graduating B.Agr.Sc. from the University of Melbourne in 1926 Mr. Vasey spent some time with the Victorian Department of Agriculture on field experimentation and research into cereals and pastures.

In 1937 he joined the Division of Animal Health and Production as Divisional Secretary. When the Division was divided into three in 1959 he became Secretary of the Division of Animal Health.

Mr. Vasey has been Secretary of the Animal Production Committee since its inception in 1939, and Associate Technical Advisor of the Cattle and Beef Research Committee since 1960.

APPOINTMENTS VACANT

The following vacancies for professional appointments are current:—

RESEARCH OFFICER (R.O./S.R.O.)—Division of Wildlife Research. 560/147 (November 22nd).

EXPERIMENTAL OFFICER FOR PASTURE INSECTS INVESTIGATIONS—Division of Entomology. (E.O. 1/2) 180/245 (November 8th).

RESEARCH OFFICER (R.O.)—Division of Wildlife Research 560/146 (November 18th).

RESEARCH OFFICER (Chemist or Biochemist) (R.O./S.R.O.)—Division of Food Preservation. 300/376 (November 22nd).

RESEARCH OFFICER (R.O./S.R.O.)—Division of Wildlife Research. 560/147 (November 22nd).

ENGINEER (Engineer 2/3)—Division of Plant Industry 130/618 (November 15th).

EXPERIMENTAL OFFICER (E.O. 1/2)—Engineering Section. 430/213. (November 15th.)

Cf 607(088.3)CO S(COR)

PUTTING SCIENCE ON FILM

The beginnings of the CSIRO Film Unit go back to early in 1945 when the Royal Society of London began arrangements for a series of conferences in London in 1946 between member countries of the Commonwealth. These conferences were to deal with current scientific activities in each country and with plans for future research.

The Royal Society suggested that each country show its research activities on film. The only countries to respond to this suggestion were Australia and Canada.

Mr. J. E. Cummins, who retired last year, and who was then Director of CSIR's Scientific Liaison and Information Bureau, was given the job of making the film.

A number of outside organizations were approached and quotes were given ranging from £5,000 to £10,000 with an estimated production time of 18 months.

But Mr. Cummins was convinced that CSIR could make this film within six months and at a cost of only £2,000.

With no previous experience of film making, Mr. Cummins gathered around him a group of four people to produce a two-hour 16 mm. film with commentary and music to be dubbed in after shooting.

Mr. Stan Evans, now Officer in Charge of the Film Unit, was to make arrangements for all shots required and to obtain details for the commentary; Mr. Eric Smith, who is now photographer for the Division of Building Research, was made available by the Division of Forest Products for camera work; and Miss Yvonne Raphael, a stenographer with the Scientific Liaison and Information Bureau was made responsible for editing.

The only person in the group with any background of practical film-making was Mr. Fred Dangerfield who was seconded from the Victorian Railways Film Section.

Using borrowed equipment and learning as they went along, the group set to work. In spite of difficulties and frustrations that few could have anticipated they completed the film in time for the Royal Society Conference.

The Film Unit as it is known today was established in 1951 when it became a separate section of Head Office.

Since then the Film Unit has produced sixty-three release films and twenty-three research record films and has won a number of distinguished awards at film festivals both in Australia and overseas.

It now has a staff of ten including editors, script writers, artists and photographers, and no longer has to rely on borrowed equipment.

The Unit's equipment includes an "Arriflex" camera, an editing table, equipment for synchronizing lip movement on film with sound recorded on magnetic tape, and a time lapse cine-camera with electronic controls.

One of the Unit's recent films "Fighting the Cattle Tick" provides an example of the way in which the Unit sets about making a film.

"Fighting the Cattle Tick" is a 16 mm. colour film with spoken commentary and a running time of sixteen minutes.

In this year's annual competition of the Australian Film Institute it received a silver award in the teaching category for a lucid exposition of its subject.

It was produced in co-operation with the Division of Entomology and the Queensland Department of Agriculture and Stock and location shots were made mostly at Ingham in Queensland.

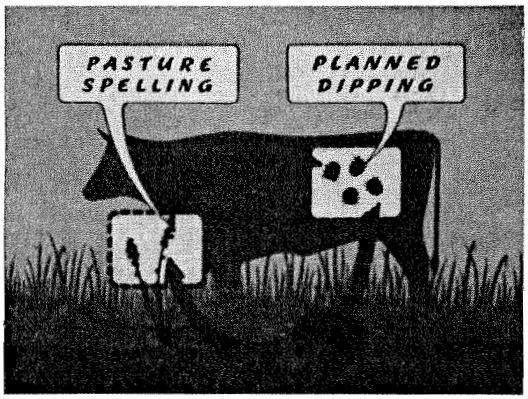
The film's purpose was to inform graziers and extension workers of the most effective measures for controlling the cattle tick found in parts of northern Australia.

For the film to get its message across it was necessary to show in a simple and forceful way the stages in the life history of the tick, the tick's dependence on cattle for the completion of its life cycle, and the existence of "weak" points in the life cycle — points at which control measures had proved to be effective.

Mr. Stan Evans wrote the very first script for this film and this was then revised and reorganized by the Division of Entomology's cattle tick workers.

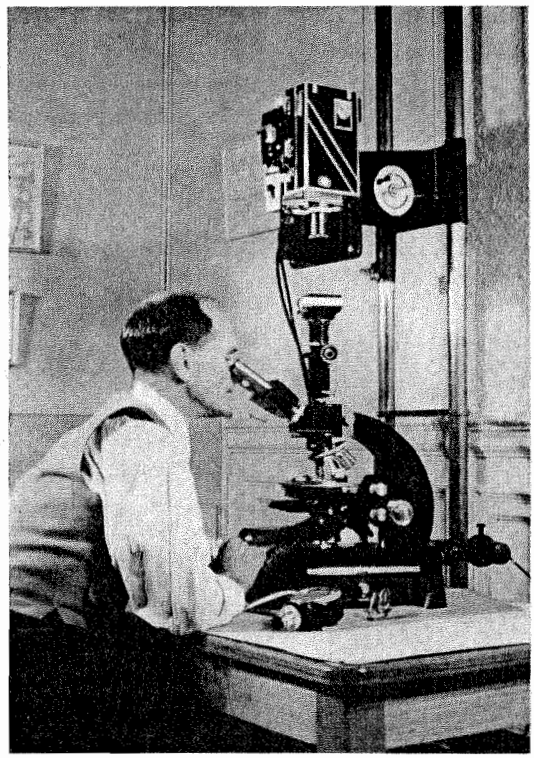
Another member of the Film Unit, David Corke, currently with Dr. Donald Thomson's expedition studying the natives of the Great Sandy Desert in Western Australia, finally rewrote the script for the film in a form acceptable to everyone.

David Corke shot most of the live action for the cattle tick film and was also responsible for directing and editing it.



Above: One of the many diagrams prepared by the Film Unit's animation artists for the film "Fighting the Cattle Tick".

Below: David Corke of the Film Unit at the controls of the mixing console used for blending sound track components—music, sound effects and commentary.



Officer in Charge of the Film Unit, Stan Evans, with photomicrographic set up for still and time lapse cinemicrography.

He worked in close co-operation with the research people so that he could be at Ingham for particular life cycle shots whenever they were available.

Stan Evans says of the ability of people in the Unit to do a number of jobs: "We are unusual in this respect. In commercial film production one man usually sticks to one job. In this Unit we look for and train people to become complete film makers."

Roughly half the tick film is taken up by animated sequences. These were executed by Mr. Perce Watson and Mrs. Aileen Weinberg, and the animation is in a large measure responsible for the clear way in which the tick life-history and control methods are demonstrated.

Ideas of animation are embodied into a script right from its conception. The animation artist makes pencil sketches according to the plan outlined to him and commentary is written or re-written to give appropriate verbal coverage.

Background colour sketches are then made and animation achieved by super-imposing transparent cellulose sheets bearing one or more diagrams and varying the position of these for each one to three exposures of a vertically-mounted cine camera.

As film is projected at 24 frames per second, 30 seconds of fast moving animation can require up to 720 single shots.

"Fighting the Cattle Tick" featured 11¼ minutes of animated sequences.

Animation artists are also responsible for titling the Unit's films.

When all "live" and "animated" film for "Fighting the Cattle Tick" had been shot the editor set about putting it together to conform to the idea embodied in the final script.

Film editor, Miss Alice O'Donnell believes that the editor needs first to be mindful of the purpose of the film and the audience for which it is intended.

In piecing the shots together another factor for consideration is the probable reactions of the scientists involved in making the film.

One of the final jobs is "marrying" the sound track to the film.

The Film Unit engages professional commentators for reading its commentaries. The sound track is recorded in the Unit's studio at Head Office and then converted to an optical track on film by a commercial laboratory.

This track, using cue marks as a guide, is printed at the appropriate places on the side of the release print.

"Fighting the Cattle Tick" had its premiere screening in Brisbane in August this year and has joined the list of the Unit's most successful films. These include "Biological Control of Insects", "The Rainmakers", and "Radioastronomy in Australia".

Honours

Mr. H. J. Frith, Chief of the Division of Wildlife Research, has been admitted to the Degree of Doctor of Science in Agriculture by the University of Sydney for his work on the ecology of birds.

Professor Sir John Eccles, Head of the Department of Physiology at the Australian National University, Canberra, and a member of the CSIRO Advisory Council, will share the 1963 Nobel Prize for medicine with Dr. A. L. Hodgkin of Cambridge, England, and Professor A. F. Huxley of University College, London. They will share the award for their discoveries concerning the ionic mechanism involved in excitation and inhibition in the peripheral and central portions of the nerve cell membrane. Sir John was made a Fellow of the Royal Society in 1941 and was knighted in 1958 for his contributions to physiological research.

This Month's Overseas Travellers

Mr. E. R. Ballantyne of the Division of Building Research left Australia recently to attend the International Union of Testing and Research Laboratories for Materials and Structures in Abidjan, Ivory Coast, Africa, and to study problems associated with building in the tropics. He will also spend about four weeks visiting research centres in the United Kingdom.

Mr. F. M. Boland of the Division of Fisheries and Oceanography has been awarded an overseas postgraduate studentship to enable him to carry out research at the John Hopkins University, Baltimore, and to study physical oceanography.

Dr. D. G. Cosgrove of the Division of Plant Industry has left Australia for North America, Great Britain, and Europe. He has received a grant from the Rockefeller Foundation and while in America will study with Professor C. E. Ballou, Department of Biochemistry, University of California. Professor Ballou is a world authority on inositol phosphates on which Dr. Cosgrove is working.

Mr. C. T. Gates of the Division of Tropical Pastures has been awarded a Seato research fellowship to enable him to study nitrogen fixation in soils under tropical conditions. He will be absent from Australia for six months and will visit the Philippines, Thailand and Japan.

Dr. D. L. Hollway of the Division of Appplied Physics left Australia last September to attend the 14th General Assembly of the U.R.S.I. in Tokyo. Since then he has been visiting various research centres engaged in microwave and radio frequency research in North America and the United Kingdom.

Dr. A. B. Hope of the Division of Food Preservation has accepted a Nuffield Dominion Travelling Fellowship in the natural sciences and will spend a year in the U.K. studying ionic movement in plant cells and across cell membranes. He will be working at the University of East Anglia, Norwich, with Professor J. Dainty. Dr. Hope will attend the International Botanical Congress at Edinburgh in August 1964, and intends making a brief visit to the U.S.A.

Dr. G. F. Humphrey, Chief of the Division of Fisheries and Oceanography, left Australia recently to attend the Executive Meeting of the Special Committee of Oceanographic Research and the Inter-Governmental Oceanographic Commission's Bureau meeting to be held in Paris in October. He will also attend the F.A.O. 12th Session to be held in Rome in November and the I.C.S.U. General Assembly to be held in Vienna.

Mr. F. J. Lehany, Chief of the Division of Applied Physics, left Australia last September to attend a meeting of the International Committee of Weights and Measures held in Paris. He will also attend the International Organization of Legal Metrology to be held in Paris in November.

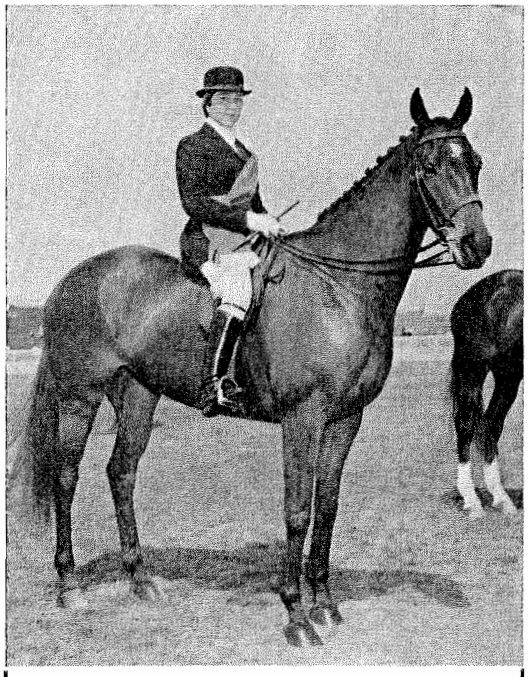
Dr. H. Lindley of the Division of Protein Chemistry is travelling to France where he will work with Dr. J. Kruh in the Research Laboratory attached to the Hospital des Enfants-Malades in Paris. In January he will transfer to the Department of Zoology at King's College, London, and will work on the biosynthesis of wool in the skin of sheep.

Dr. J. A. Maclaren of the Division of Protein Chemistry has been awarded a Fulbright Travel Grant and is spending six months with Dr. R. J. Hiskey of the Department of Chemistry at the University of North Carolina studying new methods for synthesis of cystine peptides and other organic disulphides of the type occurring in wool. Dr. Maclaren has also been awarded a Weizmann Fellowship and following his stay in the United States will spend twelve months with Professor Ephraim Katchelski of the Division of Biophysics at the Weizmann Institute of Science in Israel on polypeptide synthesis. While overseas he will also visit research centres in the United Kingdom and Europe.

Mr. J. I. Platt, Administrative Officer of the Division of Textile Physics, Ryde, left recently for London where he has been appointed Liaison Officer. Mr. Platt will be away for three years.

Mr. M. K. Shaw of the Division of Food Preservation left Australia recently to undertake a Divisional Traineeship at the University of California. He will study the physiology of micro-organisms at low temperatures to provide further understanding of the mechanisms of food spoilage.

Dr. D. E. Weiss of the Division of Physical Chemistry is at present on a ten week visit to Israel, Lebanon, Syria, and India, to discuss water supply problems in arid countries.



Miss Pam Southby of the Division of Dairy Research gathered honours for herself at the last Royal Melbourne Show. She won the Colonel Pope Cup on her bay gelding Jalnar and also carried off the award for competitive training potential. Pam also took fourth place in the Garryowen trophy for the best equestrienne turnout. Describing preparations for the Garryowen as "rather a battle", Pam said that the plaiting of the horse's mane alone took a long time to get the perfection every rider desired. Grooming was a most exacting process. Pam took Jalnar with her to Dookie Agricultural College last year when she was doing an agricultural science course. He proved to be a useful stock horse. At Dairy Research Pam assists with the work on low viscosity casein for the paper industry and re-combined powdered milk products for Asian markets.

VISITORS FROM OVERSEAS

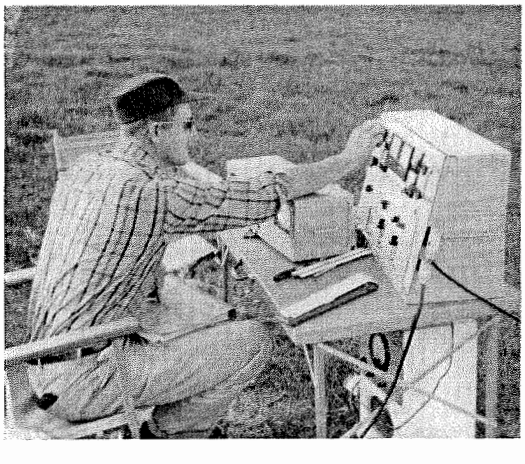
Dr. K. Asai of the Physics Department, University of Kyoto, will spend twelve months working with Dr. J. S. Dryden of the Dielectrics Section of the Division of Applied Physics. Dr. Asai has been studying the abnormal dispersion of dielectrics, chiefly long chain molecules and ammonium nitrate.

Dr. M. Demerec arrived in Canberra recently where he will spend three months with the Division of Plant Industry. Dr. Demerec, who received his under-graduate training in Yugoslavia, and studied at Cornell University, joined the staff of the Carnegie Institute's Department of Genetics at Cold Spring Harbour in New York forty years ago and later became Director of the Laboratory. His work has been on the relationship between mutations and biochemical processes. Dr. Demerec retired from the Cold Spring Harbour Laboratories in 1961 and joined the Biology Department of the United States Atomic Energy Commission's Laboratories at Brookhaven where he has continued his research.

Professor S. Hoflund of the Royal Veterinary College, Sweden, is at present on a six week visit of Australia for discussions on sheep and cattle diseases and animal nutrition. In addition to visiting CSIRO laboratories he will spend some time with State Departments of Agriculture and with University Faculties of Veterinary Science.

Mr. J. Katznelson of the Agricultural Experiment Station, Neveh Yaar, Post Haifa, Israel, is at present spending three months working with Dr. Morley of the Division of Plant Industry on the evolution and taxonomy of subterranean clover.

Mr. W. B. Goddard of the College of Agriculture, University of California, is at present on a six month visit to the Division of Meteorological Physics where he is working on the construction of two "Evapotrons". The "Evapotron" measures automatically and directly the evaporation from a natural surface such as a lake or pasture. It relates evaporation to the rate of turbulence transfer of water vapour in the vertical through measurement of air density, specific humidity, and the vertical velocity component of wind. Mr. Goddard is shown below using an "Evapotron" to record evaporation from a pasture.



Fulbright Travel Grants

Travel grants are again available to Australian citizens to go to the United States for study, research or lecturing at American Universities and other institutions of higher learning during 1964-65.

All candidates must hold a University degree or similar qualification, possess a guarantee of financial support in dollars, be affiliated with an approved American institution of higher learning, and be Australian citizens.

The minimum period of study in the United States for students is one academic year.

Lecturers must spend a minimum of one semester and research scholars three months in the United States (exclusive of travel time) of which about two-thirds should be spent at one university or recognized research institution.

All travel grants cover the cost of direct transport between the candidate's home in Australia and the institution he wishes to attend in the United States.

No allowances are made for dependants' travel.

All awards are made in open competition.

Further information and application forms may be obtained from the United States Educational Foundation, P.O. Box 559, Canberra City, A.C.T.

TECHNICAL ASSOCIATION NEWS

At the time of writing this article, Council is still awaiting a decision of the Architects' Claim which has become known as the "Technical Grades Case" in the Commonwealth Public Service.

However, arrangements are being finalized for a two-day Council-in-Person meeting followed by a meeting at Head Office with the Secretariat and possibly members of the Executive.

For the first time we will have delegates from six states as well as the elected members of Council. It is expected that the following people will represent the Association at this meeting:

Mr. Eric Murray — Federal President, Mr. Bill Menzies — General Secretary, Miss Eve Ahearn—General Treasurer, Mr. Hugh Burne — Publicity Officer, Mr. Rymel Abel — Chairman N.S.W. Branch, Mr. Rollo Waite — Chairman Queensland Branch, Mr. Ray McInnes — Chairman A.C.T. Branch, Mr. Harry Heath — Chairman Victorian Branch, Mr. Noel Buckley — Chairman South Australian Branch, and Mr. John Hill — Secretary Western Australian Branch representing W.A. Chairman.

A lengthy agenda is being prepared and it is expected that the Council meeting will commence on the Saturday morning and continue all day Sunday.

At the conclusion of the meeting, a definite list of items will be prepared for the following day which will be spent at Head Office. It is expected that Branch reports will furnish some of the material for the Head Office conference which will mainly be used for discussion on Salary claims and application of decisions affecting the Public Service Technical Grades.

Members will appreciate the difficulty in arranging these conferences to fit in with the Arbitrator's decision, but may rest assured that the most important item is "Work Value Salary Increases".

TOKYO GAMES

Head Office Social Club has received an offer from Air India of large-scale reductions in air fares for people wishing to travel to Tokyo for the 1964 Olympics in October next year.

First-class air fares from Melbourne to Tokyo will be discounted by 30% for a party of sixteen or more people.

The concession air fare will thus be £302 per person.

Aircraft on the outward journey from Melbourne to Tokyo will touch down at Perth, Singapore, Kuala Lumpur and Hong Kong. Package tours with English-speaking guides can be arranged and may include, for example, three days spent in Tokyo with the rest of the time spent touring Japan.

Modern hotel accommodation will be available, either Japanese or European style.

For further information and booking procedures please contact Miss Jean Chaplin, Head Office Social Club, 314 Albert Street, East Melbourne.

APPOINTMENTS TO STAFF

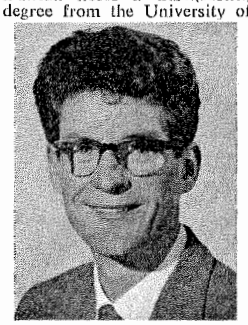
Mr. L. A. Allen has been appointed to the Division of Textile Industry where he will be associated with investigations of new methods of yarn production. Mr. Allen is a graduate of the University of Western Australia, obtaining his B.Sc. (Hons.) in 1954. He was formerly a senior physicist with Mullard Radio Valve Company, Surrey, England. His work there was mainly concerned with electron and X-ray diffraction investigations.

Miss S. DOBRZYNSKA

Miss S. Dobrzynska has been appointed to the Division of Physics where she will assist with the work of the paramagnetic resonance group. Miss Dobrzynska worked for some years in Warsaw on the development of ultra-high frequency radio valves. She holds the diploma in Electrical Engineering from the Leningrad Polytechnic (1954) and is a native of Poland. She is an Associate Member of the Australian Institute of Engineers. Miss Dobrzynska previously worked with Standard Telephones and Cables, Sydney, as a project engineer.

Mr. P. R. Crosthwaite has joined the Division of Radiophysics and is working on the 210-foot radiotelescope at Parkes. He obtained his Diploma of Electrical Engineering from the Gordon Institute of Technology, Geelong, in 1950 and graduated B.E.E. from the University of Melbourne in 1952. He was previously employed as Chief Engineer with TNQ Channel 7, Townsville. From 1953-54 he undertook post-graduate training with the English Electric Company working in their guided weapons division.

Mr. A. D. Duncan has joined the Division of Radiophysics where he will assist in the development of physical and chemical techniques and equipment used in the evaluation of cloud seeding equipment. Mr. Duncan holds a B.Sc.(Hons.) degree from the University of



Mr. A. D. DUNCAN

London. He was a member of the Imperial College expedition to Kashmir in 1960 and holds the Royal Aero Club A and B gliding certificates. His hobbies also include sailing and sketching.

Miss H. M. R. Hicks has been appointed to the Division of Mathematical Statistics and is located at the Division of Food Preservation, Sydney. She is assisting with statistical problems associated with research in

Miss H. M. R. HICKS

food technology. She graduated B.Sc. from the University of Sydney in 1961 and has been working there as Senior Computing Assistant.

Dr. Toshio Kato of the Mineralogical Institute in the Faculty of Science, University of Tokyo, has taken up a three year appointment with the Division of Soils in Adelaide. While with the Division Dr. Kato will undertake research in soil problems using X-ray techniques. He graduated B.Sc. in 1953 from the University of Tokyo and holds the M.Sc. and Ph.D. degrees from the same University. Since 1959 Dr. Kato has been research assistant in the Mineralogical Institute, University of Tokyo. He is interested in the mineralogy of clay-like substances containing ions of heavy metals.

Dr. TOSHIO KATO

Mr. N. R. Kay has joined the Division of Chemical Physics. He will work in the Electronics Laboratory of the Instrument Section and will assist in the Division's research programme, particularly in the design, preliminary construction and testing of special electronic equipment. In 1955 Mr. Kay received his diploma in Electrical Engineering at Caulfield Technical College and in 1959 graduated B.E.E. from the University of Melbourne. He obtained his Master's degree in Engineering Science in 1962 at the same University. He was formerly with the P.M.G. Department where he worked in their circuit laboratory.

Mr. N. R. KAY

Dr. W. R. Shorthose has joined the Division of Food Preservation and will investigate, in meat animals, the physiological factors prior to slaughter which affect meat quality. Dr. Shorthose graduated B.Sc. (Hons.) from the University of Nottingham in 1957, and was awarded his Ph.D. by the same University in 1962. He was previously assistant lecturer in the Department of Physiology of the Royal Veterinary College, University of London.

Dr. W. R. SHORTHOSE

Mr. J. A. Smelstorius has joined the Division of Forest Products where he will assist in the study of compounds of the plant cell wall, plant gums and the chemistry of the cambium. He is a native of Lithuania and obtained the fellowship diploma in Applied Chemistry from the Royal Melbourne Institute of Technology in 1959. He was previously a chemist at the Victorian Government Health Laboratories and from 1956-58 worked as a biochemist with the Department of Repatriation.

Mr. J. A. SMELSTORIUS

Dr. R. M. Smillie has been appointed leader of the Division of Food Preservation's Plant Physiology Unit at the University of Sydney. The Unit carries out basic research on biochemical and biophysical aspects of plant physiology. Dr. Smillie was previously employed by the Biology Department of Brookhaven National Laboratory and headed a group studying aspects of plant metabolism. He holds B.Sc. (Hons.) and M.Sc. degrees from the University of Sydney and obtained his Ph.D. degree from Queen's University, Ontario, in

Dr. R. M. SMILLIE

1959. During 1954-55 Dr. Smillie was a part-time lecturer in biochemistry at the University of New South Wales.

Mr. J. H. Whittem has been appointed Officer-in-Charge of the Division of Animal Health's Research Laboratory at Parkville, Melbourne. In this position he will supervise the planning and implementation of research projects related to the prevention and control of certain live-stock diseases and will continue to develop research in

Mr. J. H. WHITTEM

related fields. Mr. Whittem graduated B.V.Sc. (Hons.) from the University of Sydney in 1942 and then transferred to the R.A.A.F. where he completed an operational tour in the Mediterranean Allied Coastal Airforce. He spent two years, 1950-51, at the University of Minnesota on a Fulbright fellowship where his particular interest was in the study of immunology. In 1947 he joined the Animal Industry Branch of the Northern Territory Administration at Alice Springs and became Director of the Branch in 1958.

"He always contrives to leave us with the washing-up."

Copyright London Punch

CSIRO Life Insurance Plan

The A.M.P. Society is to increase the premiums payable under the CSIRO Life Insurance Plan as from 1st March, 1964.

This plan was initiated by Mr. G. F. Judd of A.M.P. in January 1959 and the total sum assured is now £1½ million.
So far there have been three death claims paid amounting to more than £9,000.

When the plan was inaugurated the A.M.P. Society indicated that premium rates would be reviewed at the end of five years and if necessary varied.

Although the Society has declared a surplus of this class of business and will allot a bonus shortly, it considers that it is still necessary to increase premiums in view of the insufficient margin of safety which exists.

However, no alterations will be made in the premiums of policies already effected and intending contributors will be given the opportunity of effecting new or additional units at the old low rates until the 1st March next year.

After that date the increased rates of premium will apply.

As an example, a member aged 30 next birthday elects to take six units. The fortnightly deduction from his salary at the current rate is 9/- and this gives him immediate death cover of £4,080 which decreases gradually each year and ends on his 65th birthday.

This type of contract is particularly suitable for young married men with dependents and for single men who anticipate taking on similar responsibilities in the future.

The low premium rate enables substantially greater cover to be secured than might be financially convenient under basic life assurance.

Any member of CSIRO who wishes to take out a policy or wishes to add additional units while the current low rates apply may obtain application forms from his Regional Administrative Officer or from the A.M.P. office in his State.

Printed by C.S.I.R.O., Melbourne.

057##1963

CORESEARCH

FOR CIRCULATION AMONG MEMBERS OF CSIRO STAFF — NUMBER 57, MELBOURNE, DECEMBER 1963

ADVISORY COUNCIL MEETS

The CSIRO Advisory Council held its twenty-eighth session at Head Office on 11th and 12th November.

One item which aroused much interest was a review of the needs for building accommodation.

Mr. G. B. Gresford said that the Organization had encountered long-standing frustration in providing itself with adequate housing.

Post-war building difficulties during a period of expansion had led to the erection of temporary premises, which in many cases were now unsafe when used as laboratories.

University expansion meant that CSIRO now had to look for new accommodation to replace that granted when universities had room to spare.

Building funds now available totalled £1 million per annum but this amount was hardly sufficient for both expansion and rehabilitation.

Major buildings erected since 1945 included those for the Divisions of Tropical Pastures, Soils, Food Preservation, Biochemistry and General Nutrition, and Plant Industry.

Buildings were now being constructed for the Divisions of Animal Genetics, Land Research and Regional Survey, and Chemical Physics.

Despite the above progress, Mr. Gresford told Advisory Council that serious situations were in evidence at Chemical Physics, National Standards Laboratory, Radiophysics, Coal Research, Forest Products, the Canberra library, Animal Genetics and Animal Health.

Dr. F. G. Lennox, Chief of the Division of Protein Chemistry, told Council members of current research in the Wool Research Laboratories on the handling and processing of wool from the time it was taken from the sheep's back until its conversion to woven fabric. Dr. Lennox also spoke of CSIRO's work on the development of new finishing processes for woven and knitted goods.

He said that the results of CSIRO's wool research had received favourable publicity throughout Australia and future efforts to meet the threat of synthetic fibres would be increased.

Dr. W. J. Scott, of the Division of Food Preservation, outlined proposals for meat research at the Division's new laboratories to be built at Cannon Hill, Brisbane.

He said that this work would be greatly assisted by the annual grant of £90,000 from the Australian Cattle and Beef Research Committee.

Dr. I. W. McDonald, Chief of the Division of Animal Physiology, and Mr. W. M. Willoughby, Officer-in-Charge of the Division's Pastoral Research Laboratory at Armidale, spoke of the laboratory's investigations into the processes governing animal production from pasture.

The aim was to use the knowledge so gained to achieve maximum quantity and quality of annual product per acre at minimum cost per unit of animal product.

Dr. J. R. Philip, Assistant Chief of the Division of Plant Industry, gave an outline of the research to be undertaken in the proposed Pye Laboratory at Canberra.

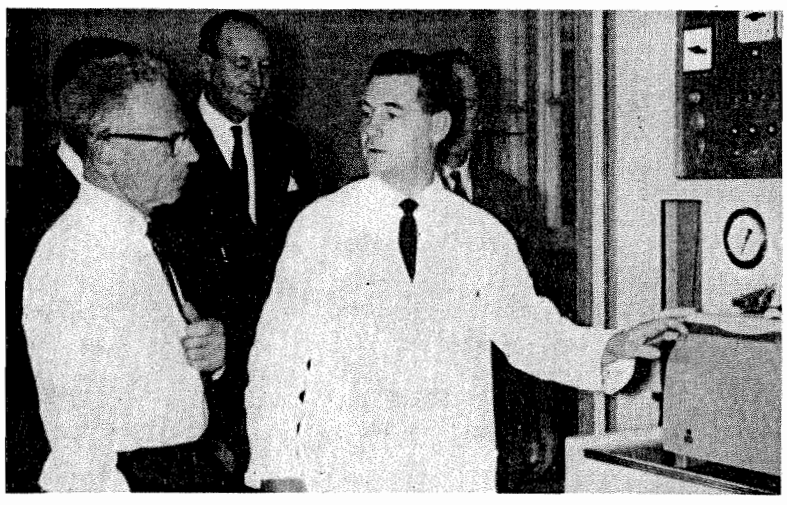
The aim of this work was to improve our understanding of the physical processes that determined the field environment.

These included the transfer processes in the lower atmosphere and soil, the energy balance at the earth's surface, water balance, and carbon dioxide balance.

A discussion on CSIRO's research work on the cattle tick was introduced by Mr. C. S. Christian of the Executive and Mr. W. J. D. Shaw, Chairman of the Queensland State Committee.

Mr. Christian said that CSIRO experiments had demonstrated that tick resistance was an hereditable character in A.I.S. cattle, and that tick resistance could be induced in cattle (under laboratory conditions) by injection of extracts of larval ticks.

Mr. A. Inglis, of the Division of Protein Chemistry, shows an amino acid analyzer developed in the Division to Dr. O. H. Frankel of the Executive and Advisory Council members, Mr. E. H. Lee Steere and Mr. C. R. Kelly. This machine can carry out nine simultaneous analyses in thirty-five hours and replaces earlier overseas models which could handle only a single analysis every twenty-two hours.



RADIO HELIOGRAPH BUILDING

HORTICULTURAL RESEARCH SECTION
6 DEC 1963
MERBEIN - LIBRARY

Above is an artist's impression of the radio heliograph building to be built at Narrabri, N.S.W., for the Division of Radiophysics. The building will be at the centre of a two mile diameter ring of ninety-six saucer-shaped aerials. Each aerial will feed information to the observation building to gain precise knowledge of the radio flares emanating from the sun. The construction of the radio heliograph has been made possible by a gift of $550,000 from the Ford Foundation. The instrument may help to solve the mystery of the gigantic explosions and storms which occur in the sun's atmosphere.

Leather Research Fund Established

Following recent discussions between CSIRO, the Department of Trade and representatives of the tanning industry, the Commonwealth Government is to establish a Leather Research Fund within CSIRO to finance investigations into problems concerning the Australian tanning industry.

The Commonwealth Government and the tanning industry will each contribute £22,000 a year to the Leather Research Fund for a period of not less than five years.

The Fund will be used to finance a new programme of leather investigations by the Division of Protein Chemistry in its recently opened five storey laboratory in the Melbourne suburb of Parkville.

The Division is already undertaking a study of collagen, the basic component of leather, in connection with the tanning of sheep skins, for use in hospitals, and its work on protein chemistry will provide a valuable background for the leather investigations.

In turn, it is expected that the Division's work on wool will benefit from a close association with the leather research programme.

Leather is an important industry in Australia. There are some one hundred tanneries in this country with an annual production worth about £22 million.

Moreover, Australia produces 38 million sheep skins and 8 million other skins, mostly from cattle, and these are processed into leather both locally and overseas.

At present leather faces a severe threat from plastics. Research into ways of improving its properties is therefore essential if it is to hold its own in the market and compete successfully with rival materials.

Initially it is envisaged that three research workers will be appointed.

The first of these will work on the structure of hides and skins, on post-mortem changes in the hide, and on their relation under different methods of curing to the various properties of the finished leather.

He will also be involved in developing techniques for assessing the various properties of hides and skins after tanning, such as feel, texture, hardness and strength.

A second research worker will concentrate on the design and construction of laboratory equipment for drumming and staking, and of instruments to measure the thickness of hides (for control of shaving and splitting), their surface acidity and their moisture content.

The third research worker will maintain liaison with the industry and will visit tanners throughout Australia to help in overcoming individual problems.

Commenting on the Government's decision to establish a leather research fund, Mr. J. J. Madigan, President of the Federated Tanners' Association of Australia, said, "The tanning industry is delighted and grateful that the Government has given it the opportunity to have research conducted by CSIRO. The tanning industry is a big exporter and is important to Australia and the meat industry".

Mr. Madigan added, "I feel sure that CSIRO will be able to work the same wonders with leather as it has already done with wool".

HONOURS

Mr. R. Brewer of the Canberra Regional Laboratory, Division of Soils, has been awarded the degree of Doctor of Science by the University of Sydney.

Mr. J. M. Gillespie of the Division of Protein Chemistry has been awarded the degree of Doctor of Science by the University of Melbourne for his work on the fractionation and characterization of wool proteins.

Mr. L. L. Muller of the Division of Dairy Research has been awarded the 1962 Silver Medal of the Australian Society of Dairy Technology. This award is for the best paper published in the Australian Journal of Dairy Technology in the year preceding the award.

S(COR)

Atomic Absorption

At the recent meeting of the Advisory Council, Dr. A. Walsh of the Division of Chemical Physics spoke of the pioneering work carried out by the Division on the development of methods of chemical analysis based on atomic absorption spectroscopy.

He said that the subject of spectroscopy became possible a century ago when Kirschhoff and Bunsen showed that atomic substances could emit or absorb light at wavelengths characteristic for each atomic species.

Emission spectroscopy was now a widely used tool in chemical analysis.

In 1953, however, theoretical studies at the Division of Chemical Physics indicated that, contrary to generally accepted principles, methods based on atomic absorption spectra would offer vital advantages over the conventional methods which used atomic emission spectra.

The method and apparatus had been patented and licences to manufacture had been granted to firms in Australia, United Kingdom, United States of America, Italy, and France.

There were now some three hundred atomic absorption installations and it was expected that at least three hundred a year would be installed during the next few years.

In order to assist Australian laboratories to assess the merits and scope of the atomic absorption method, the Division arranged for the manufacture in Australia of various items of equipment such as atomic spectral lamps, atomizers and amplifiers, and these were assembled with existing monochromators to provide atomic absorption spectrophotometers.

In August 1962, Techtron Pty. Ltd., Melbourne, commenced production of complete atomic absorption spectrophotometers, based on monochromators imported from England or Germany.

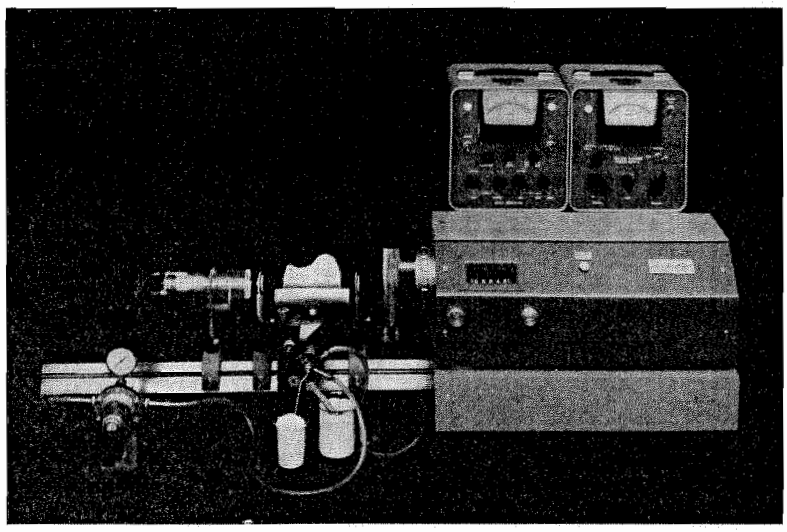
Techtron now had in production a grating monochromator, designed by the Division and using replicas of gratings produced on the Division's ruling engine.

It was confidently expected that many of these monochromators, and complete atomic absorption spectrophotometers would be exported.

The special atomic spectral lamps which had to be developed for this work had been manufactured since 1959 by Ransley Glass Instruments, Collingwood.

The demand for these lamps, particularly from overseas, grew to such an extent that in March this year a separate company, Atomic Spectral Lamps Pty. Ltd., was formed and this firm was devoting itself exclusively to spectral lamp manufacture.

The majority of the firm's lamps were exported and the demand was continuing to grow.



Above: Locally made equipment for atomic absorption analysis.

Production facilities were being extended to cope with an annual production of lamps valued at £200,000.

Dr. Walsh said that the atomic absorption method was now used in more than seventy Australian laboratories engaged in mining, metallurgy, agriculture, medical research, electroplating, brewing, wine-making, and oil analysis. Continual improvements in technique were broadening the scope of the method and the demand for equipment was expected to increase for several years.

Virus Diseases of Livestock

Dr. E. L. French of the Division of Animal Health gave Advisory Council members a review of some of the research into virus diseases of livestock conducted at the Division's Parkville laboratory.

Dr. French said that viruses differed from most other causative agents of infectious diseases because they could not be grown in inert culture media independent of the living cells within body tissues.

This had created a great obstacle to the study of viruses and associated diseases.

In relatively recent years, however, this obstacle had been largely overcome, firstly by the use of the developing egg embryo then, secondly, and more importantly, by the application of techniques that facilitated the growing of tissue cells through a number of generations in test tubes outsmall, would provide a national centre that would side of the body.

These new techniques had been rapidly taken up overseas by veterinary laboratories and in order that Australia should not lag behind in gaining new knowledge in this field, CSIRO had established a virus research unit at the Division of Animal Health's Parkville Laboratory in 1958.

The unit, which was under the direction of Dr. French, was still the only research unit in Australia exclusively devoted to research on virus diseases of livestock.

The first objective was to reveal and study virus causes of livestock diseases in Australia.

A second important objective was to create a skilled specialist group which, even though stimulate the thought and action that would augment our defences against devastating virus diseases of livestock should they enter the country despite the quarantine barriers.

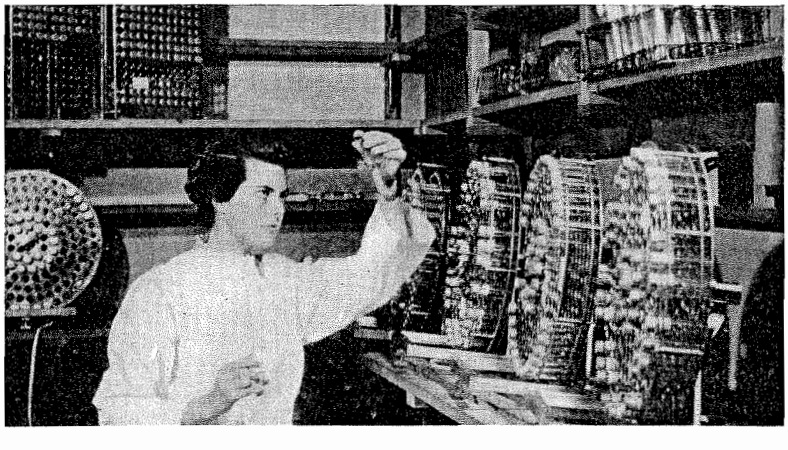
Dr. French described some of the viruses that had been isolated, identified and studied at the Parkville Laboratory.

These included the viruses responsible for sporadic bovine encephalomyelitis (a serious brain disease of cattle occurring in Tasmania, Victoria and New South Wales), and the virus responsible for both infectious bovine rhinotracheitis and infectious pustular vaginitis.

Dr. French said that the virology unit had made good progress in the last four years, despite what were often unavoidable limitations in the provision of facilities.

The recently completed extension of the Parkville Laboratory would provide space for additional staff and for facilities such as an electron microscope, required for work on biophysics, while additional animal accommodation and ancillary facilities were being provided at the Division's experiment station at Maribyrnong.

Below: Examining tissue culture tubes for growth.



LUDWIG LEICHHARDT FELLOWSHIP

The German Embassy in Canberra has announced the establishment of a Ludwig Leichhardt Fellowship by the Federal German Government to commemorate the achievements in Australia of the German naturalist and explorer Ludwig Leichhardt who was born near Berlin in the year 1813.

The grant will be under the aegis of the Humboldt Foundation in Bad Godesberg.

It will be available to Australian post-graduate scholars for research in Germany, preferably in one of the scientific disciplines.

The first grant will be made in 1964 and will be tenable for one to two years.

The basic allowance has been fixed at £90 per month with additional allowances for wife and children.

Fellowship holders will not be responsible for either university fees or return fares.

Further details can be obtained from the German Embassy in Canberra.

Retirement

Mr. Bert Williams, head stocktaker for the Victorian Regional Office, retired from the Organization recently because of ill-health.

Following war service with the RAAF Mr. Williams became a clerk with the Division of Forest Products in 1946.

He resigned from this job but later joined the stores records section at Head Office.

Throughout his career with CSIRO he has carried out stock taking in all parts of the Commonwealth except Western Australia and the Northern Territory.

Mr. Williams will be remembered by a large number of people for his unfailing courtesy and friendliness.

BURSARY

Master A. A. Stewart, son of Mr. G. A. Stewart, Chief of the Division of Land Research and Regional Survey, received this year's Geelong Grammar School bursary.

Two of these bursaries are held at any one time and are awarded to sons of employees of CSIRO "in recognition of the great contribution made by CSIRO to the grazing and other industries."

Annual value of each bursary is two-thirds of the total school fees.

TECHNICAL ASSOCIATION NEWS

One of the most gratifying effects of our publication of the present Salary Claims for CSIRO Technical Staff, has been the response from individuals and groups wishing to join the Association.

These people we warmly welcome, as numerical strength is the lifeblood of our Association, and the greater the percentage of financial members, the greater impact our negotiations have on various issues.

But we have recently noticed that a number of usually isolated individuals who have joined our Association for various reasons have now come to the conclusion that they can enjoy any benefits gained by the Association without having to contribute one penny.

The fact that they run up a bill with the Association for each year's subscriptions does not seem to worry them. Neither does the fact that their fellow Technical Staff, who are financial members, are put in the position of helping to pay for the privilege of negotiating Salary rises for them.

So much for the few individuals who just cannot be bothered remaining financial in their Association.

COUNCIL-IN-PERSON MEETING

Reference to this meeting was made in the previous issue of "Coresearch". Arrangements have now been made to hold the Council meeting on the 7th and 8th December, followed by our meeting with the Secretariat on the 9th. Each of these meetings will be held at Head Office.

We would like to draw members' attention to the Agenda which has been prepared. The easiest way of doing this is to enquire from your Divisional delegate or Branch Secretary.

The Branch Delegate who attends the Council meeting will be able to carry out his job in Melbourne much better if he is shown that the Branch members are vitally interested in the proceedings.

SUB CLOVER MAN HONOURED

The Premier of South Australia, Sir Thomas Playford, last month unveiled a simple road-side plaque near Nairne in the Adelaide hills.

The plaque is near the spot where in 1889 Hertfordshire-born Amos William Howard picked a sprig of subterranean clover in a neighbour's paddock.

The memorial is the first recognition of the late Mr. Howard who spent forty years encouraging farmers to use subterranean clover.

In 1889 subterranean clover was of no economic significance, but Howard recognized that it might easily be of great benefit to farmers in his district.

From this small beginning subterranean clover has spread over tens of millions of acres of pasture country in the autumn-winter-spring rainfall zone of Australia.

Speaking in Adelaide recently, Dr. F. H. W. Morely, Assistant Chief of the Division of Plant Industry, said that subterranean clover was Australia's most famous pasture plant.

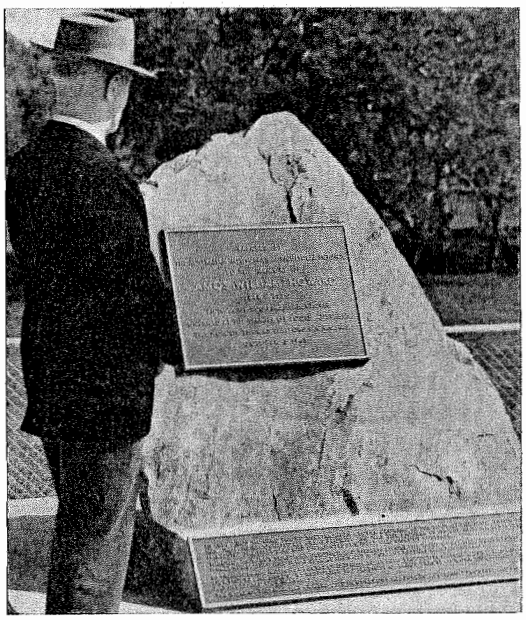
He forecast that subterranean clover could be the key to pasture improvement on more than one hundred million acres in southern Australia.

Dr. Morley also estimated that an average of four sheep to the acre could be kept on established sown pastures based on subterranean clover.

This would increase Australia's sheep numbers three or four times.

The Australian Institute of Agricultural Science has opened an A. W. Howard Subterranean Clover Memorial Appeal for £25,000 to advance pasture development in Australia.

Donated money will support research on improved pastures in any part of Australia by the award of fellowships and grants to aid specific projects.



Above: The basal inscription on the plaque reads in part: *"In 1889 Amos Howard found subterranean clover growing at the foot of the slope below this memorial. He recognised its great promise and was the pioneer of its use in sown pastures. He harvested the first seed and distributed it widely throughout Australia."*

$ 15,000 Rockefeller Grant

The Rockefeller Foundation has made a grant of $15,000 to the Division of Soils in Adelaide for the purchase of special equipment to assist Dr. A. D. Rovira in the study of the soil micro-organisms surrounding plant roots.

Portion of the grant will be used for the construction of artificially-lit growth cabinets similar to those designed and developed by the Engineering Section for "CERES", the Canberra phytotron.

These cabinets will enable research to be carried out on plants and micro-organisms grown in environments where light, daylength, temperature, and humidity can be carefully controlled.

The grant will also be used to purchase special equipment which will make it possible to grow plants in an atmosphere containing radioactive carbon dioxide and to measure the uptake and release of radioactive materials by plant roots and microbial cells.

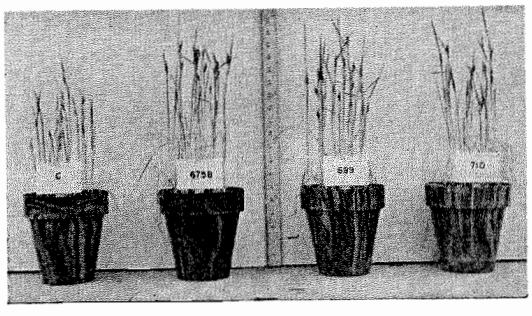
Research workers at the Division have already shown that healthy plants excrete many substances such as sugars, vitamins and amino acids which act as nutrients for the bacteria and fungi in the root zone.

Some of these micro-organisms are harmful to the plant and are responsible for various diseases.

Others, however, are beneficial and can assist plants by protecting them from root diseases, releasing insoluble plant nutrients from the soil, and stimulating plant growth by producing vitamins and hormones.

Research workers hope that when more is known about the stimulation of bacteria and fungi by root excretions it may be possible to inoculate seed so as to introduce beneficial micro-organisms into the soil around roots and thus improve plant growth.

Below: At Cornell University last year Dr. Rovira obtained growth responses in wheat grown from inoculated seed. The wheat plant in the left of the picture has been grown from uninoculated seed. The other plants have been grown from seed inoculated with (from left to right) Azotobacter, Clostridium, and Bacillus.



Moonie Pipeline Aids Soil Studies

The recently completed Moonie oil pipeline has provided soil scientists of the Soil Survey and Pedology Section of the Division of Soils in Brisbane with an opportunity of examining soil profiles along a 190 mile transect from Moonie to Brisbane.

For the keen pedologist nothing matches the pit face study of soil profiles and the pipeline trench offered the ultimate, providing what was probably a once-in-a-lifetime opportunity of continuous profile examinations along its full length.

From late June to the end of September all but a dozen miles of the trench profile were examined by the Brisbane pedologists.

The trench was about 2½ feet wide and 4 feet deep—large enough to walk in in comfort and give a useful depth of section without isolating the observer from the landscape.

In some parts the soil profile had been disturbed by preliminary ripping or by drilling and blasting but the exposures were still useful.

Construction of the pipeline involed an impressive array of personnel and equipment.

Forty-foot lengths of 10 inch diameter mild steel pipe were first strung out alongside the trench. They were then measured and bent where necessary to follow changes of slope along the line of the trench.

Pipe sections were lifted onto low blocks, the levelled ends cleaned by buffing, and the sections electrically welded end to end to form a continuous pipe supported on high blocks above ground and to the side of the trench.

Finally the completed pipe was lifted, cleaned and wrapped, and lowered into the trench to be covered by the bull dozers which left a neat ridge of soil along the centre of the trench to allow for settling.

The open trench proved a trap for both farm animals and native fauna including a large number of snakes. Although most of the snakes were non-poisonous they provided an element of excitement, particularly when attention was being focussed on the trench face.

In many respects the trench was ideal for continuous soil profile examination in south east Queensland.

As an east-west section it crossed, more or less at right angles, rainfall isohyets and several major geological, geomorphological and soil boundaries.

About one-third of its length ran through areas previously covered by reconnaissance soil surveys, thus providing opportunities for checking and extending earlier observations and interpretations.

The trench digging and filling averaged about twelve miles a week and this put the pressure on the pedologists who had to choose constantly between rather hurried examinations along the whole 190 miles or more detailed examinations on limited sections with the possibility of missing out on some of the more interesting phenomena in the intervening portions.

The great value of the trench lay in the continuity it gave to observers of sub-soil features and changes, and their relationship to underlying materials, drainage and site.

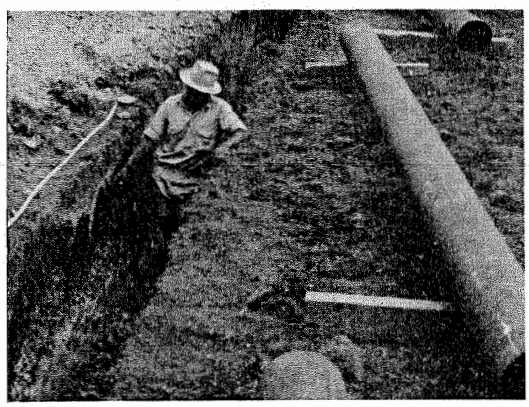
In places there was striking evidence of depositional layering of soil materials and burial of older soils.

There were also many interesting examples of strongly ordered patterns of local variation associated with gilgai micro relief and involving strongly contrasted materials.

Other conspicuous but apparently random variations were bewildering.

While crossing the Darling Downs two fossils were exposed at different sites and were later identified at the Queensland Museum as tail bones of a giant kangaroo and the mandible and teeth of a giant wombat.

Below: Section of the Moonie pipeline trench on the outskirts of Brisbane.



Our Unsung Heroes

The life of CSIRO administrative officers is seldom routine, nor is it without its hazards.

An administrative officer at one of the Organization's field stations received the following letter from a seventeen-and-a-half stone ex-commando with a police record for assault and battery who "worked" for a short while at the station until forcibly ejected.

"Dear Jack-in-Office,

For your kindness, courtesy and consideration I thank you.

Your indifference and intolerance, your discrimination and disregard for my welfare is also deserving of reward.

I hope that we might meet again in the near future that I may present my sentiments toward you more fully and forcibly.

I remain Sir,
Yours in destitution and despondency,
C.K."

DRAMA AWARD

Alice O'Donnell of the Film Unit is part-time art director of the City of Heidelberg Repertory Group.

She recently gained honours for the Group by producing Arthur Miller's "A View from the Bridge".

At the South Street competitions in Ballarat her production of this play was judged a winner and took the Jean Barklamb Memorial Prize.

Miss O'Donnell has produced about six plays for the Heidelberg group including Wilde's "Ideal Husband" and Agatha Christie's "The Unexpected Guest".

She is at present working on a play written by New Australian author Eric Wolff. This play, provisionally titled "Remind me of Alex", will be produced early in 1964.

APPOINTMENTS VACANT

The following vacancies for professional appointments are current:—

EXPERIMENTAL OFFICER (E.O.—1/2)—Division of Wildlife Research. 560/148 (6th December).
EXPERIMENTAL OFFICER (E.O.—1/2)—Fodder Conservation Section. 400/101 (18th December).
EXPERIMENTAL OFFICER (E.O.—1/2) (Chemist)—Division of Biochemistry and General Nutrition. 250/134 (16th December).
SCIENTIFIC SERVICES OFFICER (S.S.O.—2/3)—Editorial Section. 112/36 (6th December).
RESEARCH OFFICER (R.O.) (Biochemist)—Division of Animal Health. 202/214 (20th December).

Overseas Visits

Dr. R. G. Giovanelli, Chief of the Division of Physics, visited the U.S.A. to attend the Symposium on the Physics of Solar Flares at the Goddard Space Flight Centre, Maryland, U.S.A. While in America he visited the McMath-Hulbert Observatory, Michigan, and the U.S. Naval Observatory, Washington.

Dr. W. R. Hesp of the Division of Coal Research is attending the United Nations Iron and Steel Symposium in Prague and will visit research establishments in Italy, Germany and the United Kingdom before returning to Sydney.

Mr. A. J. Higgs of the Division of Radiophysics was selected as a member of the Australian delegation which attended the Extraordinary Administrative Radio Conference, Geneva. This Conference was held during October and November and its purpose was to allocate frequency bands for research activities such as radioastronomy and satellite communication. Mr. Higgs will return to Australia via the U.S.A.

Dr. M. Lipson, Chief of the Division of Textile Industry, recently visited Singapore, Hong Kong, and Japan to establish contact with people interested in industrial research. He also visited Bangkok to discuss developments in wool textile research.

Dr. J. D. Morrison of the Division of Chemical Physics has been awarded a Senior Foreign Science Fellowship by the National Science Foundation, U.S.A., and has accepted an appointment under this award as Visiting Professor in the Department of Chemistry, Princeton University, New Jersey. Dr. Morrison will be away for twelve months and will deliver a course of graduate lectures in physical chemistry.

Mr. R. C. McVilley of Head Office is making a twelve month visit to Thailand under the Colombo Plan. He will provide administrative assistance in the establishment of the Applied Scientific Research Corporation, Bangkok.

Dr. J. P. Wild of the Division of Radiophysics recently attended the Symposium of Physics and Solar Flares at the Goddard Space Flight Centre, Maryland, U.S.A. At the conclusion of the conference Dr. Wild visited the U.K. to inspect progress on development work for CSIRO's radio-heliograph project.

Analogue Computer

Tenders will be called this month for a large general purpose analogue computer to augment the digital computing network now being supplied to the Organization by Control Data Corporation of Minneapolis.

The addition of the new computer will enable research workers to choose the most suitable computational approach to each particular problem and will also facilitate research in process dynamics, process control, process optimization, reactor design, and in the many other fields of chemical engineering amenable to analogue techniques.

Some use of hybrid analogue-digital computing techniques is also expected.

Initially the machine will comprise about eighty operational amplifiers and a large complement of non-linear equipment as well as suitable peripheral facilities.

However, it is hoped to extend the size and scope of the installation over the next few years.

The computer will be housed with the Division of Chemical Engineering in Melbourne but will be available to research workers throughout the Organization.

APPOINTMENTS TO STAFF

Dr. K. Higuchi has accepted a Fellowship with the Division of Radiophysics for twelve months. He will work on the measurement of the vertical velocity of air parcels in clouds. Dr. Higuchi is Assistant Professor of Geophysics at

Dr. K. HIGUCHI

the Hokkaido University, Sapporo, Japan, and from 1959-60 worked with American scientists on Fletcher's Ice Island in the Arctic Ocean.

Mr. R. H. Hill has accepted an appointment with the Division of Meteorological Physics, where he will assist with the design, construction and testing of research instruments. He holds the B.Eng. degree (1960) from the University of Melbourne and was formerly with the Government Aircraft Factories, Melbourne.

Mr. H. T. Kelleher has been appointed to the Division of Radiophysics to assist in the development of techniques and equipment used in the evaluation of cloud seeding experiments. Mr. Kelleher graduated B.Sc. (Hons.) from the University of Sydney in 1962, and has completed a course in weather forecasting with the Commonwealth Bureau of Meteorology.

Dr. K. Kellerman, an American citizen and a Ph.D. graduate (1959) from the California Institute of Technology, has been appointed to the Division of Radiophysics where he will work on radio-astronomy. For the past two years he has been conducting research on the spectra of radio sources at the California Institute of Technology.

Dr. R. Ledger is a new appointee to the Division of Protein Chemistry, where he will study the action of chemicals used in the finishing of wool and woollen fabrics. Dr. Ledger graduated B.Sc. (Hons.) from the University of Sheffield in 1960 and was awarded his Ph.D. degree in 1963.

Dr. A. Lawson has accepted a Fellowship in Surface Chemistry with the Division of Tribophysics. He was previously an assistant lecturer in the Chemistry Department of Glasgow University and holds

Dr. A. LAWSON

the B.Sc. (Hons.) and Ph.D. degrees from that university. He will work on the influence on catalytic activity of crystal defects and surface preparation.

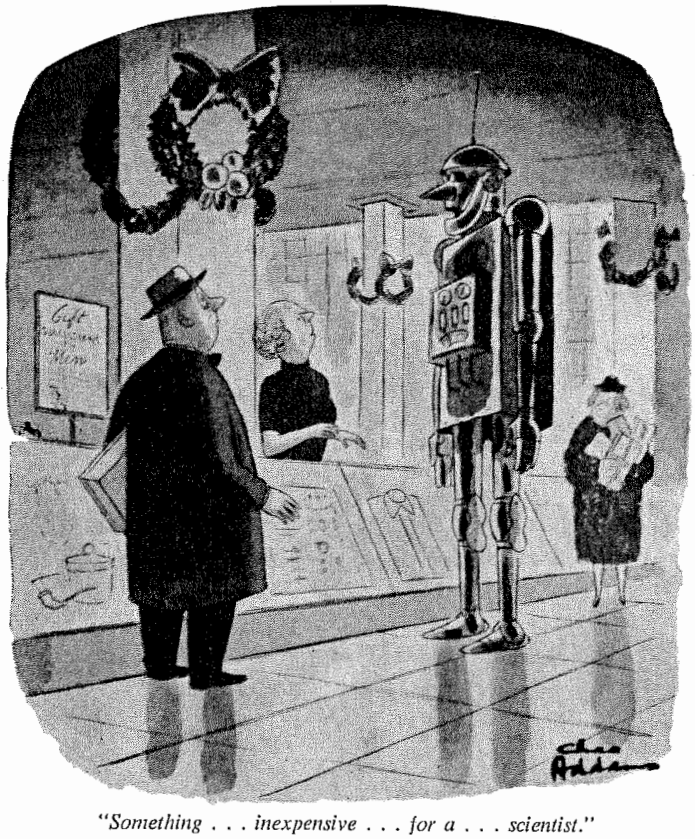
Dr. J. J. Lynch has accepted an appointment at the Pastoral Research Laboratory, Armidale, where he will investigate the plant and animal factors which enhance or impede the acquisition of food from pasture by free-grazing animals. Dr. Lynch graduated B.V.Sc. from the University of Sydney in 1957 and was awarded his Ph.D., University of Adelaide, this year. From 1957-58 he was a veterinary officer with the Department of Agriculture, South Australia.

Miss P. M. Hope has been appointed to the Division of Fisheries and Oceanography, where she will assist in phytoplankton research. Miss Hope graduated B.Sc., Sydney University, in 1959 and M.Sc. from the same University in 1962.

Miss P. M. HOPE

She was previously a research worker at Monash University and spent three years in the Biochemistry Department, Sydney University, as demonstrator.

Dr. J. C. Ward has been appointed to the Division of Coal Research to investigate the transient free radicals produced in gas phase pyrolysis, together with other reactions of organic compounds, using electron spin resonance techniques. He graduated B.Sc. (Hons.) from London University in 1949. Since 1962 he was employed by a Buckinghamshire firm manufacturing magnetic recording tape.



"Something . . . inexpensive . . . for a . . . scientist."

Courtesy McClure Syndicate.

VISITORS FROM OVERSEAS

Dr. N. W. Broten, of the Radio-Astronomy Group of the National Research Council, Canada, is spending two years with the Division of Radiophysics and will work with the 210-foot telescope at Parkes.

Dr. M. Demerec, of the United States Atomic Energy Commission's Biology Department, is at present on a six months visit to Australia, spending three months at Canberra with the Division of Plant Industry. This will be followed by visits to other genetics laboratories throughout the country. Dr. Demerec is a past Director of the Carnegi Institute's Department Carnegie Institute's Department of Genetics, Cold Spring Harbour, New York, and is well known for his work on the relationship between mutations and biochemical processes.

Dr. E. G. Droessler, Head of the Chemical Sciences Section of the National Science Foundation, Washington, is spending twelve months with the cloud physic group of the Division of Radiophysics. He was previously in Australia for the Cloud Physics Conference in 1961.

Dr. B. Elizabeth Horner, Associate Professor of Zoology, Smith College, Massachussetts, U.S.A., and Dr. J. Mary Taylor, Assistant Professor of Zoology, Wellesley College, Massachussetts, are currently visiting Australia under a National Science Foundation Grant. During their twelve months stay in Australia Drs. Horner and Taylor will use the facilities of the Division of Wildlife Research to interpret the temporal and geographic pattern of the spread of members of the Australian rat family.

Dr. K. Kolar, of the Biological Research Station, Wilhelminenberg, near Vienna, is visiting the Division of Wildlife Research laboratories in Canberra and will accompany officers in a study of areas at Griffith (N.S.W.), Tidbinbilla (A.C.T.), Hunting Ground (Tasmania), and Fisher Island. Dr. Kolar is particularly interested in the behaviour of parrots and his trip to Australia is being undertaken primarily with the view of following up behavioural studies on birds in their natural environment.

Dr. I. Prakash, of the Central Arid Zone Research Institute, Jodhpur, India, is visiting Australia under a UNESCO Fellowship and will work with the Division of Wildlife Research. His main interest is in ecology, particularly that of rodents and lagomorphs (hares and rabbits). Dr. Prakash is also interested in the management of native animals and National Parks in Australia.

Printed by CSIRO, Melbourne