

PRICE JOINS EXECUT

Dr. J. R. Price, D.Sc., D.Phil., F.R.A.C.I., F.A.A., Chief of the Division of Organic Chemistry, has been appointed to the Executive. Dr. Price will replace Professor Badger who leaves later this month to become Deputy Vice-Chancellor of the University of Adelaide.

Dr. Price began his career as a laboratory cadet at the University of Adelaide.

He studied science at the University part-time and graduated B.Sc. with first class honours in 1933 and M.Sc. in 1935,

He was then awarded an over-seas scholarship by the Royal Commissioners for the Exhibi-tion of 1851 and left Australia for England where he worked at Oxford University under Professor Sir Robert Robin-son, F.R.S.

After graduating D.Phil. he became Head of the Chemical Section of the John Innes Horticultural Institution in 1937. When war broke out he transferred to the Ministry of Supply and worked on propel-lants and explosives. In 1945 he returned to Aus-tralia and joined the C.S.I.R. Division of Industrial Chemistry.

Chemistry.

He was appointed Officer-in-Charge of the Organic Chemistry Section in 1960. The following year the Section became a Division with Dr. Price as its Chief.

Dr. Price was awarded the degree of Doctor of Science by the University of Adelaide in 1954 and the H. G. Smith Memorial Medal of the Royal Australian Chemical Institute in 1956 in 1956.

He was elected a Fellow of the Australian Academy of Science in 1959.

Science in 1959. Dr. Price's scientific work has centred on the chemistry of plant constituents. His earlier studies at Ox-ford and at the John Innes Institution were on quinonoid and anthocyanin pigments. He made substantial contributions to knowledge of their struc-ture, distribution and in-heritance in flowering plants. On ioining CSIRO his in-

On joining CSIRO his in-terests turned to alkaloids as the class of constituents most likely to provide new com-pounds with useful pharma-cological properties.

cological properties. A spate of papers followed on the acridine, furoquinoline and canthinone alkaloids of the family *Rutaceae* which proved to be one of the richest Australian sources of alkaloids. In association with Dr. L. J. Webb of the Division of Plant Industry he realised the scope in this country for a broad study of phyto-chemistry.

Committee Member

Dr. D. F. Waterhouse, Chief of the Division of Entomology, of the Division of Entomology, has been appointed to a com-mittee which will investigate the present and prospective need for the establishment of a College of Advanced Educa-tion in the Australian Capital Territory to prepare students and grant diplomas at the tertiary level.

The chairman of the commit-tee will be Professor H. Burton, Principal of the School of General Studies, Australian National University.



Dr. J. R. PRICE

Together they enlisted the collaboration of many chemists in universities and other insti-tutions, resulting in a highly productive period of study of Australian natural products. Dr. Price was born in Kadina, South Australia, in 1912. He is married and has three children. He is still a formidable opponent on the squash court and enjoys growing native Australian plants.

The activities of this large but informal group achieved international renown as the Australian phyto-chemical survey.

Natural products research has always meant much more to Dr. Price than the isolation of new compounds and the elucidation of their molecular structure.

He has always laid strong emphasis on the screening of plant extracts and constituents for their potential value in medicine and agriculture.

medicine and agriculture. Upon becoming Chief of the Division of Organic Chemistry he developed a vigorous and integrated syn-thetic chemistry group which has made important contribu-tions in the new areas of organometallic and hetero-atom chemistry and has de-veloped new products of value to industry. to industry.

to industry. Dr. Price has been extremely active in the affairs of the Royal Australian Chemical In-stitute. He was President of the Victorian Branch in 1959 and Federal President from 1962 to 1964.

He was Associate Editor of Institute publications (1949-53), a member of the Editorial. Board (1954-55) and Editor of both "Proceedings" and "Re-views" (1956-58). He is at present chairman of several lostitute committees Institute committees.

Baas Becking Laboratory

The Baas Becking Biogeological Research Laboratory, named after the late Dr. L. G. M. Baas Becking of the Division of Fisheries and Oceanography, will move shortly into its permanent home at the new Bureau of Mineral Resources Building in Canberra.

The Laboratory was estab-lished in July last year under the joint sponsorship of CSIRO, the Bureau of Mineral Resources, and the Australian Mining Industry Research Association

Resources, and the Awamment Mining Industry Research Association. The broad objective of the re-search work is to study the biological and chemical pro-cesses associated with the formation of mineral deposits and with other geological phenomena.

and with other geological phenomena. Dr. L. G. M. Baas Becking was one of the first to recog-nize the possibility that biological, in particular micro-bial, activity may play an im-portant role in the genesis of subhide ores.

portant role in the genesis of sulphide ores. After a distinguished re-search career in the United States, Java, Australia, and his native Holland, Dr. Baas Becking joined the Division of Fisheries and Oceanography in 1952.

1952. Some of his studies of sea-water and the estuarine en-vironment suggested the possible deposition of metals under marine conditions. This work became of great interest to geologists and he was therefore seconded to the Bureau of Mineral Resources in 1957. At the Bureau to

Aureau of Mineral Resources in 1957. At the Bureau he began giv-ing some of his time to the formation of sulphide minerals under marine coulitions, and succeeded in demonstrating the formation of a number of metal-sulphide minerals by sulphate-reducing bacteria in artificial sea-water at room temperature. In 1960, a number of min-in g companies, operating thr ough the Australian Mineral Industries Research Association, joined with the Bureau and CSIRO in financ-ing a small research unit to

enable Dr. Baas Becking to

enable Dr. Baas Becking to pursue his studies. Ill-health unfortunately pre-vented Dr. Baas Becking from doing this and he died in January, 1963. However, during the period 1961 to 1963 his work was generally confirmed and appre-ciably extended by Dr. K. L. Temple, who was on a two year research Fellowship with the Division of Plant Industry. In general, the work reached the stage where it could be visualized that, under certain conditions, the biogenic formation of suphides might be an important factor in the formation of some economic ore deposits.

tormation of some economic ore deposits. As a result of this work, it was decided to embark on a more ambilious research pro-gramme and the three support-ing organizations formed the Baas Becking Biogeological Research Laboratory. Initial emphasis will be placed on investigations to establish the relationship of biological factors to the natural physico-chemical en-vironment with particular reference to the possible role of these factors in the forma-tion and transformation of sulphide minerals. It is planned to extend re-search at a later stage to in-clude other important minerals of possible biogenic origin such as carbonates and phos-phates.

phates.

phates. Dr. P. A. Trudinger, of the Division of Plant Industry, and Mr. W. M. B. Roberts, of the Bureau of Mineral Re-sources, will be in charge of research operations, respon-sible to a committee of management under the chair-manship of Mr. Haddon F. King of Conzine Riotinto.



While in Canberra last November, Crown Prince Vong Savang of Laos visited the Division of Plant Industry's Ginninderra Experiment Station. Prince Yong Savang is shown above inspecting some of the Division's pasture work with the Station Manager, Mr. R. J. Hutchings (right), and the Australian Ambassador to Laos, Mr. D. Dexter.



CHRISTMAS CHILDREN'S PARTIES

Many CSIRO laboratories cele-brated Christmas last month with children's parties. Top left. Father Christmas had plenty of fans at the Division of Forest Products party where he distributed toys to one hun-dred and twenty children in-cluding twenty-five from the Allambie Reception Centre. Top right. Robert Mouliss draws a bead on Father Christ-mas party. Left centre. Margaret O'Don-

mas at the Head Office Christ-mas party. Left contre. Margaret O'Don-nell made short work of her bottle of lemonade at the Head Oflice party. One hundred and twenty-five children, including twenty-seven from the Antonian Institute, Richmond, took part in the celebrations. Right centre. Harry O'Shea en-tertained almost as many adults as children with his electric tractor rides through "Fairy-land" at the Division of Tex-tile Industry's Christmas party at Geelong. Left Bottom. At Highett, the Divisions of Building Research, Dairy Research, and Mechan-ical Engineering joined forces to help entertain some two hun-dred children who, with very little assistance from their parents, ate and drank their way through 25 pounds of frank-furts, 50 dozen cakes, 40 pounds of sweets, 10 dozen scones, 50 dozen soft drinks, and 50 dozen ice creams. The appetites of the group below appear to have been temporarily satisfied. Right bottom. Father Christ-mas received a big welcome

Right bottom. Father Christ-mas received a big welcome from the children when he arrived at Highett.









News In Brief

Assistant Chiefs

Mr. J. G. Downes has been appointed Assistant Chief of the Division of Textile Physics, and Mr. G. W. Walls, Assistant Chief of the Division of Textile Industry.

Mr. K. R. Norris has been appointed an Assistant Chief of the Division of Entomology. The Division already has two Assistant Chiefs, Dr. M. F. Day and Mr. F. N. Ratcliffe.

Free for All

The circulation of "Co-research" has, until now, been confined to members of the staff of CSIRO. From time to time it has been suggested to the Editor of "Coresearch" that retired members of the staff who maintain an interest in the Occasization might like in the Organization might like to be put on the mailing list.

Members of the staff might like to advise their retired colleagues that "Coresearch" is available to them on request.

All Too Human

Television, apparently, hath charms to soothe a savage savage beast.

When four gorillas at the Bronx Zoo were taken from their outdoor cages last winter and confined indoors, they became bored, cranky and out of sorts. Finally, out of despera-tion, a television set was placed in front of their cage.

When the set was turned on petulant brawling stopped and so did the other symptoms of boredom and frustration. Only the biggest of the gorillas, a fifteen-year-old male named Mambo, turned his attention from the television and went back to his old habit of bully-ing the others — but only during the commercials.

The gorillas' favourite pro-grammes were those with general humanoid forms mov-ing about rapidly. Westerns were a great favourite. Several

orangutans in the adjoining cage had a clear view of the television set but remained quite uninterested.

Screen News

The 314 Film Society will screen a programme of docu-mentary films from North America at 8 p.m. on January 20th, at Head Office.

The Forest Products Film Society will screen "Mon Oncle" at 8 p.m., February 3rd, at the Division of Forest Products, Melbourne.

Poached Eggs

The Hawaiian Fish and Game Department has been practis-ing deception to spare the nene, Hawaii's official state bird, from extinction.

The female Hawaiian goose The female Hawaiian goose or nene usually lays one clutch of three to five eggs a year. Conservationists from the Department have been stealing these eggs and giving them to specially trained bantam chickens to sit on until the acclingt he be the goslings hatch.

The gosings natch. The nene, her first clutch missing from the nest, lays several more eggs. These eggs are stolen, too, and placed in the custody of another chicken, whereupon the nene usually lays a third clutch which, much to her relief, she is permitted to sit on and hatch.

Meat Quiz

Australians prefer their steak from yearling animals — and of course they like their meat to be tender. be tender.

be tender. This was the result of a 100-family survey carried out in Brisbane by the Division of Food Preservation, in co-operation with Professor H. D. Naumann of the University of Missouri. 110

showed The survey steaks from cattle of different breeds, or different grades within the same age group, or be-tween fresh and frozen steaks.



It was an exciting day for the children at the Constal Plains Research Station when a group of senior officers from Land Research arrived in a chartered light aircraft. The two aboriginal children are from nearby Humpty Doo. The other two children are Richard Boult and Bill Langfield, sons of CSIRO officers. All the children attend the small school on the Station, conducted by Mrs. Langfield.

Charity Fund

The Division of Forest Pro-ducts Staff Charity Fund re-cently gave a bookcase to the Richmond-Hawthorn day the Richmond-Hawthorn day training centre for mentally retarded children.

The centre was one of eighteen different institutions supported by the Fund this

A total of £450 was distributed in amounts ranging from a few pounds up to £100. Members of the Fund vote to decide which institutions

to decide which institutions they will support. The Division's National Savings Group decided to donate their interest to charity this year. As a result, £65 was handed to the Victorian Society for Crippled Children and Adults.

POSITIONS VACANT

The following vacancies for professional appointments are current:



Visitors

Mr. W. J. Kugler, the Argen-tine Secretary of State for Agriculture and Livestock, tine Secretary of State for Agriculture and Livestock, visited Australia last month to see something of our research, production and marketing methods. His itinerary in-cluded visits to the Divisions of Plant Industry, Animal Genetics, Tropical Pastures, and Textile Industry.

Mr. P. S. Kulkarni, of the National Chemical Laboratory of the Indian C.S.I.R., arrives in Sydney this month where he will spend six months with the Division of Coal Research obtaining avanciance in the obtaining experience in the operation of mass spectro-meters and their application to the determination of organic structures.

Mr. A. Nahyi, of the Ghanaian Ministry of Agricul-ture, will spend two weeks in Canberra this month with the Divisions of Plant Industry and Lond Research and then Divisions of Plant Industry and Land Research and then twelve weeks at the Irrigation Research Laboratory at Griffith. Mr. Nahyi, who is in Australia to obtain further experience in irrigation agronomy, has already spent some time with the Division of Meteorological Physics and with the Division of Plant In-dustry at its Riverina Labora-tory, Deniliquin.

Mr. J. D. Tutu, of the Food Research Institute, Ghana, will visit Tasmania this month with Visit lasmania this month with a research team from the Division of Food Preservation to gain experience in the pro-cessing of vegetables. Mr. Tutu intends studying for his M.Sc. at the University of New South Wales later this year vear.



Cutting It Fine

Hardly a week-end passes without our hospital casualty clinics reporting serious damage to a foot or hand due to a motor lawn mower accident.

Such accidents as this are caused by carelessness, disregard of manufacturers' instructions, and failure to have the mowers inspected and kept in good order.

Observing the following simple precautions can do much to lessen the risk of accident when using power mowers.
Check the fuel supply and that all safety devices are in place before you begin. Never refuel while engine is running or hot. Turn off and allow it to cool.

When starting mower, stand with your feet firmly planted in a safe place. Don't use a motor mower when barefooted or wearing open sandals.
Turn off the motor when leaving mower, even for a

• Turn off the motor when leaving mower, even for a short period.
• Don't allow children to come close when the mower is in operation. If you use a rotary scythe type, never allow anyone to stand or pass on the discharge side.
• On inclines and terraces, be careful of your balance and footing. Your foot can slip under the mower before you know what is happening. Don't pull it towards you on an incline. incline.

Before mowing the lawn, clear it of stones, sticks, wire and other objects. Before mowing on rough ground or in high grass, set the blades to the maximum height to minimise ejection of debris. Never attempt to remove anything from the mower until

• Never attempt to remove anything from the mower until the motor has completely stopped. Make sure you know how to throw the clutch of the barrel blade type of mower or to stop the motor of any mower quickly in an

or to slop the motor of any more gamma, emergency.
Don't use an A.C. electric mower when the grass is wet.
If you have to work underneath the mower, or the blades are jammed, stop the motor and disconnect the spark plug (or electrical lead) to prevent accidental starting.
W Hallow Safety Officer. J. W. Hallam, Safety Officer.



PORT MORESBY BOUND

Mr. J. Moss of the Division of Building Research left Mel-Mr. J. Moss of the Division of Building Research left Mel-bourne recently to take over the Division's Port Moresby office which was established in 1962 by Mr. J. Barned. In the last three years a wide range of investigations have been started in Papua-New Guinea into problems of building in the tropics. These include external and internal environment studies, assessment of paint fungicides, examination of roofing materials and construction, and the measurement of dimensional changes in locally produced concrete blocks. Mr. and Mrs. Moss are shown above examining a display of typical Administration houses in New Guinea.

Dr. P. R. Brady has been ap-pointed to the Division of Tex-tile Industry where he will work on basic aspects of the rapid continuous dyeing process using concentrated urea/acid solu-tions. Dr. Brady graduated B.Sc. with honours in 1960 and M.Sc. in 1961 from the Uni-versity of Melbourne. He re-cently obtained his Ph.D. from the same University for his work on chemical applications of the Mossbauer effect.



Dr. P. R. BRADY

Dr. E. A. Jeffery arrived in Melbourne last month from Bri-tain. He will work with the Division of Organic Chemistry on the synthesis of organic com-pounds. Dr. Jeffery graduated B.Sc. with honours from the University of London in 1959 and Ph.D. from the same Uni-versity in 1962. After two years with the University of Cali-fornia he returned to the Uni-versity of London in 1964.

Mr. R. J. Corr has joined the Division of Building Reseach where he will undertake oper-ational research into the mangement processes of productivity of all sections of the Australian building industry. Mr. Corr graduated B.Mech.E. from the



Mr. R. J. CORR

University of Melbourne in 1959 and has worked for the last ten years in the design branch of the Commonwealth Department of Works.

Department of WORS. Dr. G. S. Kennedy has been appointed to a postdoctoral fellowship with the Division of Plant Industry. He will investi-gate the chemical factors in pasture plants which affect the diet preferences of sheep. After graduating B.Ag.Sc. with hon-



ours from the University of Adelaide in 1958, Dr. Kennedy spent three years at the Uni-

versity of Queensland. He beversity of Queensland. He ob-came a research fellow at the Australian National University in 1962 and was awarded his Ph.D. by the University last year for his work on alkaloid variations in *Dubolsia*.

Dr. J. Lappage has been ap-pointed to the Division of Tex-tile Industry where he will study existing mechanisms of draft-ing fibre assemblies with a view to developing new methods. Mr. Lappage graduated B.Sc. from the University of Leeds



Dr. J. LAPPAGE

in 1960 and M.Sc. from the same University in 1962. He re-cently obtained his Ph.D. from the University of Leeds for his work on the design and devel-opment of an instrument for rapidly measuring the mean fibre diameter and the coeffi-cient of variation of fibre dia-meter of woollen products.

Mr. J. R. Lindsny has joined the Division of Animal Physi-ology where he will study diges-tion and metabolism in sheep. Since graduating B.S. from the University of Adelaide in 1963, Mr. Lindsay has been under-taking research at Monash Uni-versity on the glucose meta-bolism of the rat brain.



COMMERCE 13 $\left(\right)$



Miss Robin Martin of the Editorial and Publications Section was crowned Queen of Commerce last November in a quest organised by the Dandenong Lions Club. The aim of the quest was to raise £7,000 for a new sports stadium at Dandenong near Melbourne. Robin raised nearly £700 towards this in five reacher.

Mr. L. F. O'Brien has been appointed to the Division of Building Research where he will work on heating and air con-ditioning. Mr. O'Brien has spent the last twenty years with

Mr. L. F. O'BRIEN

the Aeronautical Research Laboratories on various aerodyna-mic investigations. He obtained his Diploma of Applied Physics from the Royal Melbourne Institute of Technology in 1963.

Dr. R. L. McCown, a recent appointee to the Division of Tropical Pastures, will study various sown pasture species and mixtures under different management systems in monsoonal tropical regions of northeastern Australia. He will be stationed at the Townsville Pastoral Research Laboratory. Dr. McCown graduated B.Sc. from Pennsylvania State Uni-versity in 1960 and M.Sc. from the University of Colifrom the University of Cali-fornia in 1962. He recently ob-tained his Ph.D. from the University of California for his studies of competition between soft brome and long storks-bill (Erodium botrys).

Mr. R. J. Tyler arrived in Sydney recently from Britain to join the Division of Coal Research. He will carry out de-terminations of the surface properties and pore structure of | carbonaceous and inorganic materials. Mr. Tyler graduated B.Sc. with honours from the University of London in 1960, and has worked for the last ten years in the research depart-ment of a large distilling firm. ****





Professor W. T. WILLIAMS

Professor W. T. WILLIAMS D.Sc. in 1956, all from the University of London. From 1933 to 1936 he was Demon-strator in Botany at the Imperial College and the next four years were spent as Lecturer at the Sir John Cass Technical College at London. From 1946 to 1951 he was Lecturer in Botany at Bedford College, London, and since 1951 has been Professor of Botany at the University of Southampton. Professor of Botany at his hobbies as music, science fiction, beer drinking and broadcasting.

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TOULTURAL RESEARCH BE 083##1966 SEA 966 WENDEIN - LIBRARY FOR CIRCULATION AMONG MEMBERS OF CSIRO STAFF - NUMBER 83, MELBOURNE, FEBRUARY 1966

Government Policy Science and

The attitude of governments to research has changed dramatically as a result of the last war. The impact of science on every aspect of human affairs has now grown to a stage where most Cabinet decisions made today should show evidence of its influence.

In an endeavour to obtain maximum benefit from scientific endeavour, a number of European countries have set up organizations to advise governments on national scientific policies.

This development appears to have been caused, not so much by the high levels of expendi-ture incurred, but by recogni-tion of vital national needs and by the growing influence science and education everyday affairs.

An awakening of overseas governments to the problem is well illustrated by the activi-ties of the Organization for Economic Co-operation and Development which includes most European countries, Canada, the United States and Japan Japan.

The scientific directorate of O.E.C.D. is particularly con-cerned with the question of national science policy and tackles the problem in a practical way.

Firstly, this organization offers to arrange an evaluation of a member country's scien-tific arrangements, expenditure

and policy-making. To do so, leading scientists familiar with policy problems in other countries meet reprein other countries meet repre-sentatives of scientific organi-zations and of the government of the country being studied for searching discussions on national science policy.

The resultant reports re-turned to the O.B.C.D. in Paris prove invaluable, not only to the science policy of the sub-ject country, but also to other member countries concerned with similar questions.

with similar questions. In a new concept of science policy, the O.E.C.D. recom-mends a two-phase approach. "Policy for Science" in-cludes government support for education and research. "Science for Policy" is the enlightened approach to gov-ernment policy - making in which scientific implications are accorded equal considera-tion with other important policy elements. Major policy areas of

Major policy areas primary, secondary, and

Washington Job

Any young stenographer plan-ning a working holiday in the United States may be interested in a vacancy which exists at the Office of the Australian Scientific Attache in Washing-ton ton.

Applicants should be able to write shorthand at 100 words per minute and type at 60 words per minute. The salary is \$U,S.4.480.

Fares to and from Washing-ton will be the responsibility of the individual and not the Commonwealth.

Mr. L. Peres at Head Office would be pleased to hear from any CSIRO staff or friends of staff who may be interested in this position.

tertiary industries, internal and external trade, defence, inter-national affairs and social wel-fare all include some scientific aspects. The effectiveness of govern-

ment policy in all these fields is increased by an understand-ing of the influence of science. This article is based on an address given last November by Sir Frederick White in the final seminar of a series arranged by the Division of Plant Industry on policy-making for science and tech-rology nology

A number of the more de-veloped countries are now showing interest in this new policy concept, partly because of soaring research investment, but principally because of accompanying dividends in the national economies. The Federal Remultic of

The Federal Republic of Germany, for instance, is spending 1.9% of its gross national product on science. The Federal Government has

announced that this percentage is insufficient and has set a target of 3% for 1970.

The science budget of West Germany is financed as fol-lows: State Governments 38%, Federal Government 24%,

Federal Government 24%, private sources 38%. Canada is setting up a science advisory organization at the present time. In that country, the Govern-ment has been advised to set up a council to consist of approximately twelve mem-bers, including heads of exist-ing science organizations and representatives of the universi-ties, industry and other institutions. institutions.

institutions. A "Science Secretariat", headed by a Director, and formed to serve the Advisory Council, has been operating for some time. The Council itself, however, has not yet been set up and it is possible that this reversal of sequence could obscure the demarcation of responsibilities in the long run. France, Belgium and West

France, Belgium and West Germany have also set up machinery for advising their Governments on science policy. These countries now have some form of national ad-visory council which is served by a full-time secretariat.

FOREST PRODUCTS CHIEF



Mr. R. W. Muncey of the Division of Building Research has been appointed Chief of the Division of Forest Products. He succeeds the late Dr. H. E. Dadswell, who died in December, 1964. After graduating B.E.E. from the University of Melbourne in 1943, Mr. Muncey joined the C.S.I.R. Lubricants and Bearings Section (now the Division of Tribo-physics) where he worked on the development of instruments for measuring the muzzle velocity of projectiles. In 1946 he transferred to the Division of Building Research where his main interests have been in architectural acoustics, thermal insulation, and concrete slab floors for houses. He received his M.E.E. from the University of Melbourne in 1951. Mr. Muncey is well known to many oflicers throughout the Organization for the role he has played for the last three years as advocate for the CSIRO Officers' Association.

In some cases the govern-ment has set up a special com-mittee of Cabinet (consisting of the Ministries concerned, such as Education, Agriculture, Defence and Health) to con-sider science policy matters.

The national science coun-cils of these countries are composed principally of scien-tists — entirely so in the case of France.

The arrangements in West Germany reflect its federal system in a committee of eleven State and six Federal civil servants together with representatives of the universi-tion and the scientific instituties and the scientific institu-tions that have grant-giving responsibilities.

Belgium's semi-autonomous "National Council on Science Policy" regularly reviews science policy, recommends programmes and compiles retateting statistics.

This country has extended the science advisory structure further with an Interdepart-mental Commission on Science Policy composed of senior Policy composed of senior officials of the Ministries con-cerned and chaired by the Secretary General of the "National Council on Science Policy".

Sweden's Advisory Conneil includes the Prime Minister and other ministers together with academics and industrialists.

Civil science in Britain is now the responsibility of two government departments— the Ministry of Technology and the Department of Education and Science.

The Ministry of Technology s principally concerned with ndustrial science of interest to British manufacturing industry.

British manufacturing industry. The Department of Educa-tion and Science supports all other civil science and makes grants in aid of research in the universities through a series of semi-autonomous bodies which include the Uni-versity Grants Committee, Medical Research Council, Agricultural Research Council, Natural Environment Research Council, and Social Sciences Research Council (a new body). body).

Although the Minister of State in the Department of Education and Science is ad-vised by a Council for Scien-tific Policy, there is no single senior Council advising the Government at Cabinet level on its overall science policy.

It is important to realise that the various national science councils have not been formed for long and are feel-ing their way in this new field.

Ing their way in this new field. In no case is the national science body intended to exer-cise any jurisdiction whatever in the management of research; however, its influence, exerted at the highest policy-making level, would be reflected in altered governmental finance allocations as a result of changes in national policy.

The increasing role of science seems to call inevitably science policy - making machinery on a national scale.

NEW YEAR HONOURS

Dr. O. H. Frankel of the Exe-cutive was created a Knight Bachelor by the Queen in the New Year's Honours Lists.



Sir OTTO FRANKEL

He received his knighthood "in recognition of his out-standing public service in the fields of plant research and biology".

Mr. L. B. Hamilton, Direc-tor-General of the Department of Social Services, was awarded an O.B.E. in the New Year's Honours Lists,

Before his recent appoint-ment to the Department of Social Services, Mr. Hamilton represented the Treasury at meetings of the Executive and the Advisory Council.

The best interests of science and of the country in general should not be prejudiced by this development providing the councils are advisory and providing normal channels of communication remain open between research institutions, Ministers and Governments. These advisory arours ob

These advisory groups ob-viously face a difficult task.

In order to deliberate effec-tively upon important prob-lems the group will often have to make itself thoroughly familiar with relatively un-familiar fields.

This would necessitate in-tensive investigation and close discussion with the organiza-tions concerned.

Further problems could be posed by the traditional re-luctance of many scientists to become involved.

become involved. However, it is vital to the effective functioning of national science councils that scientists serve willingly and take a deliberative interest in the broad scientific problems of the country.

The question of the appoint-ment of a Minister for Science is a common one today.

There are good arguments for and against.

for and against. On one hand, every Govern-ment Minister needs to be aware of the scientific issues in his sphere of responsibility; on the other hand, a scientific advisory council would need to be directly responsible, pre-sumably, to a Government Minister.

A "Minister for Education and Science" with a co-ordinating, deliberative func-tion could present the council's views with strength at the highest policy-making level.

RESEARCH AT THE TOP END

The Coastal Plains Research Station is at Humpty Doo, a mere forty miles from Darwin. You set off down "the bitumen" towards Alice Springs, and after twenty miles you turn left along a narrow sealed road which runs through a light scrubby forest of ironwoods, paperbarks, stringybarks, gardenia shrubs and palms.

Here and there is a strychnine tree, covered with bright red or yellow berries. The berries are worth £90 a ton in Darwin, and picking them is a profitable part-time occupation.

Eventually a notice - board comes into sight on your left, and you are at the Station gate. The Station is about the size of a large cricket ground. In the middle is an air-conditioned laboratory, with brilliant bougainvillias growing over the entrance.

the entrance. Around the periphery are eight houses and a block of four motel-type flatettes. They are typical Territory buildings, built mainly of asbestos cement sheet, with the louvred windows and fans found in all tropical buildings. Not far from the laboratory is a small swimming pool for the children. The only other building on

the children. The only other building on the site is the schoolroom, where Mrs. Langfield, wife of the Officer-in-Charge, teaches a small brood of white children from the Station and aboriginal children from a nearby cattle property. property.

The Northern Territory Adinistration hopes in the near future to appoint two agro-nomists to work at the Station, and three new houses are being built.

being built. The work on the Station is centred around rice growing. Only three miles away, after you pass through a belt of pandanus palms, you come to a vast treeless plain, extending over a thousand square miles. On the edge of the plain is the Station's farm, a hundred acres of rice fields with irriga-tion channels running between them.

them.

The channels are fed from Fogg's Dam, a mile or so away. The dam was surveyed in the 'fifties by the Utah Construction Co. (to which Fogg belonged) and was built by the RAAF for Territory

Below. Preparing land for rice sowing at Humpty Doo.

Rice Pty. Ltd. at a cost rumoured to be £70,000.

Today, apart from being the purce of CSIRO's irrigation ater, it is a very beautiful rd sanctuary. Fringed with source water, hird reeds, and covered with water-lilies, it is the home of thousands of birds.

Thousands of Dirds. Ibises, cranes, cormorants, magpie geese, pigmy geese and other waterfowl feed in its shallows. Huge jabirus flap lazily across the lake and kite-hawks and brilliantly hued bee-eaters skim across the surface.

The waters abound with barramundi, bream and mullet. Through the great plain flows the crocodile infested Adelaide river, which bursts its banks in "the wet" and spreads a shallow flood across the plain.

the plain. The area seems ideal for rice-growing yet the great American-financed commercial enterprise of the 'fifties failed. Territory Rice Pty. Ltd. began operations in 1953 and from the start encountered very serious problems. The com-pany withdrew in 1959. The Coastal Plains Research

The Coastal Plains Research Station was founded in 1959, too late to be of help to Territory Rice.

The problems facing the establishment of an industry were soon delineated, and a start was made on solving them.

A major difficulty was the lack of suitable rice varieties. This was the problem faced by Mr. E. C. B. Langfield, the present Officer-in-Charge of the Station.

the station. He succeeded eventually in breeding an improved new variety called SIRCNA, which is now the main experimental variety

SIRCNA yields just as highly as other varieties, but produces better quality rice. It still needs greater straw strength to facilitate easy

There are grounds for op-timism that new varieties, now under test, will have this extra strength.

Another problem, not yet tackled in depth, is a lack of knowledge of the capacity of the soils to provide plant nutrients.

Future plans are for ex-panded CSIRO work on soil chemistry, coupled with agronomic research and ferti-lizer trials by the Northern Territory Administration.

The pest problems are not too serious. The main insect pest is the stem borer, a moth that lays its eggs on the rice plant leaves.

The larva bores into the stem and eats out the heart of it. The stem borer is, how-ever, kept in check partly by a predatory wasp and partly by insecticides.

Both magpie geese and cockatoos do minor damage to a mature crop, but hardly at an economically significant level.

Sowing rice in flooded fields practised in California but not in the Tropics.

Mr. A. L. Chapman has studied the effects of high temperature in seeding estab-lishment, and has developed suitable field techniques by using a tractor with very large pneumatic tyres on all four wheels to simulate aerial simulate aerial wheels to seeding.

To date paddy yields have been lower than by dry sowing techniques but current investi-gation on suitable varieties and methods of fertiliser application should allow good vielde to be obtained yields to be obtained.

All in all, the Station has had several successes in the nao several successes in the six years since it was founded. The most important break-through has been in rice-breeding, a fact recognized by the award of an M.B.E. in 1964 to Mr. Langfield.

There are other interesting I here are other interesting possibilities for r improved yields. One of these involves "ratooning", in which the rice field is fertilised and re-flooded after harvesting, to climulate re-prowth and a stimulate re-growth and a second harvest from the same stand.

The Station has made The Station has made a good start towards solving the problems of rice growing in the Northern Territory. Its efforts may one day lead to the founding of another com-mercial enterprise, hopefully more successful than the last.



Above. Rice breeder, Mr. E. C. B. Langfield, at work in the field.

Overseas Visits

Mr. B. F. C. Cooper of the Division of Radiophysics will leave shortly on a four month visit of radioastronomy centres in the United States and Britain where he will study techniques and developments in instrumentation. Mr. Cooper will also visit laboratories in France and Japan.

Mr. M. L. Dudzinski of the Division of Mathematical Statistics will leave this month on a six month visit of research America, centres in North Americ Britain, Poland and Finland.

Dritam, Poland and Pinland. Dr. I. G. Jarrett of the Division of Nutritional Bio-chemistry will leave shortly for N or th America, Britain, Europe, Israel, and Hong Kong where he will visit veterinary and biochemical laboratories in connection with his own work on the utiliza-tion of carbohydrate and lower fatty acids by ruminants. He will be away for almost nine months.

Dr. R. Mykytowycz of the Division of Wildlife Research will leave next month for North America, Britain, and Europe, where he will spend six months visiting labora-tories concerned with animal behaviour. behaviour.

Dr. A. L. G. Rees, Chief of the Division of Chemical Physics, will leave for Germany later this month to attend an Executive Committee meeting of the International Union of Pure and Applied Chemistry in Frankfurt.

Mr. G. B. Stirk of the Divi-sion of Tropical Pastures will leave this month on a nine month visit to agricultural re-search centres in the United States, Britain, and Israel.

Mr. J. V. Sullivan of the Mr. J. V. Sullivan of the Division of Chemical Physics left recently on a four-week visit to the United States where he will visit laboratories and commercial manufacturers working in the field of ab-sorption spectroscopy. He will also deliver a paper on latest development in absorption spectroscopy at an inter-national symposium on modern mational symposium on modern methods of analytical chemistry.

Mr. A. D. Young of the Division of Chemical Engin-Mr. A. D. Young of the Division of Chemical Engin-eering will leave shortly for Britain where he will spend one to two years working at the Warren Spring Laboratory on a computer control project.

Sound Suggestion

CSIRO is constantly besieged with requests to carry out re-search on a host of varied problems. Some of these requests are sensible, others not quite so.

However, a suggestion with which many will agree was made in the Editorial column of the "Canberra Times" last month. Might not CSIRO, the paper asked, take on the transistor as it did the rabbit?

"Is it beyond the skill of physicists to do to the trannie what chemists have done to the fly?" the paper continued.

"We can get one sort of spray that kills flies, and another that repels them - or as the pop poetry of the advertising puts it, gives us personal spray-on protection.

"It would perhaps be inhumane to want a device which, when pressed, would actually destroy a trannie. There is no reason why its owner should not be able to use it in his home or his car. even at the river when nobody else is about.

"Two less devastating instruments would do most of US.

"One is a device which, when pointed at a trannie, would disable it for a few hours.

"The other, for the more permissive lover of peace and quiet, would prevent radio waves from reaching him — or, as the advertisements for it might say, surround him with a transistor-free zone of personal protection."



News In Brief

President

Mr. H. B. Somerset of the Executive has been elected President of the Australasian Institute of Mining and Metallurgy.

Re-appointed

Mr. E. P. S. Roberts has been re-appointed a part-time mem-ber of the Executive for a further period of three years from March 14.

Screen News

Screen News The Food Preservation Film Society will screen the Czech. film "Death is Called Engel-chen" at 7.30 p.m., Tuesday, February 15, at the Division's theatrette, North Ryde. The film deals with the activities of Czech. partisans in World War H.

The constraints and the activities of Czech, partisans in World War II. The Forest Products Film Society will screen "Mon Oncle" at 8 p.m., Thursday, February 3, at the Division's theatrette, South Melbourne. The 314 Film Society will screen two French films "Chronique D'un Ete" and Jean Cocteau's "Opphee" at 7.30 p.m., Thursday, February 17, at Head Office.

Butterfly Stamps

Eleven multi-colour butterfly design stamps will be issued on February 14 for Papua and New Guinea for their decimal

New Guinea for their decimal currency series. The butterfly designs are adapted from photographs of specimens from the Australian National Insect Collection which is in the custody of the Division of Entomology.

Council Meeting

The first "Council-in-person" meeting of the Laboratory Craftsmen Association was held in Canberra on the 15th and 16th December. The meeting was attended by dele-gates from New South Wales, Victoria, and the A.C.T.

Fenner had just been ap-

pointed Professor of Micro-

biology at the Australian National University when

the virus was introduced.

The introduction was the re-sponsibility of CSIRO's Wild-life Research Section (now the Division of Wildlife Research), and F. N. Ratcliffe was the Officer-in-Charge.

They have collaborated in a report without parallel in the history of epidemiology.

Attempts by the Division of Animal Health to establish the virus in the field in the early 1940's had been unsuccessful; then in late 1950 it spread. No one could have visualized

the extent and speed of this

As things turned out, the colossal field experiment with myxoma virus (in which between 10° and 10° rabbits died).

tween 10⁸ and 10⁶ rabbits died) was, from a scientific view-point, well timed. The Wildlife Survey Section was able to assemble an ener-getic group of young field workers who were able to col-laborate with Fenner as the need arose and to fill in many details of the biology of the rabbit and of the insect vectors

vectors. The seasons were conducive to spread by mosquitoes. Fen-ner had recently completed a

spread.

Housing Project

The King William Co-opera-tive Limited, a non-profit cooperative society for public servants has launched a hous-ing project in the Melbourne suburb of Fitzroy. Four three-storey blocks of

flats are to be built in King William Street within half a mile of the city. Altogether there will be 42 separate-title

there will be 42 separate-title flats. The one-bedroom flats are priced at £3,995 (\$7,990) and the two-bedroom flats at £4,895 (\$9,790). All members of CSIRO staff resident in Melbourne are eligible for membership of the Co-operative. Further details may be obtained from the Manager of Projects, Dr. F. O. Tamas (telephone 82-2886).

Visitor

VISIOF Dr. E. Ross, Chairman of the Department of Food Science and Technology at the Uni-versity of Hawaii, Honolulu, is spending five weeks in Aus-tralia on sabbatical leave. Dr. Ross, who is making a survey of tropical and Asian food products in countries border-ing the Pacific, is making his headquarters in the Division of Food Preservation. Food Preservation.

Northern Development

Mr. C. S. Christian of the Executive will take part in a symposium on northern de-velopment at the University of New South Wales on February 14 and 15

New South Wales on February 14 and 15. The symposium is a joint project between the University and the People the North Committee. A similar sym-posium was held at the Uni-versity in 1961.

Good News

In spite of the changeover to decimal currency the price of Coresearch will remain un-

NEW BOOK ON MYXOMATOSIS

The spread of myxomatosis in Australia in the 1950's was one of the most

significant incidents in Australian science. Many publications record the

happenings of the period, but a detailed assessment has only now been



Tenders Called for Science Centre

Tenders for the construction of the National Science Centre at Parkville, Melbourne, were called last month and it is hoped that building can be started on 1st April this year.

Plans provide for an office block, to be known as Clunies Ross House, joined to an auditorium block by a common entrance and fover.

The office block will be a sixstoried reinforced concrete building containing 36,000 square feet of effective office accommodation. A basement car park will be able to house 36 cars and there will be provision for parking a further 20 cars in the grounds. Apart from this, there are ample parking facili-ties pearby ties nearby.

The auditorium block will The autonorithm block will contain an air-conditioned conference area for 500 people. It will be possible to subdivide this with soundproof parti-tions, to provide three separate conference rooms each served by a common projection room. Browing is also being mede

Provision is also being made Provision is also being made for the installation, when funds permit, of equipment for simultaneous interpretations in four languages and for closed circuit television. An audio-control room will enable tape-recording form each coefer recording from each conference room.

Services planned include a bank, a kiosk, and a dining-supper room which will be available as a staff canteen at lunch time.

The auditorium block will Also house a "Sciences Club". Membership of the club will be restricted to full members of scientific and technological

Froth and Bubble

The Division of Dairy Re-search has come up with the answer to a problem which has plagued espresso fans and milkshake enthusiasts for years: why does that inviting foam on capucini and milk-chelos object discussors in the shakes almost disappear in the autumn?

The culprit has been shown to be an anti-froth enzyme (lipase) which, although always present in milk, is only acti-vated if the milk is agitated violently.

In autumn, when cows are starting to dry off, the small amount of milk produced tends to get splashed around more than normal in the milking machines and vats. The result: no froth on your coffee.

no froth on your coffee. To combat this effect, the Division has recommended milk pasteurisation at a higher temperature and homogenisa-tion — and more care in handling autumn milk. The suggestions have been passed on to the milk producers.

societies accredited to the National Science Centre. The club will have regular dining facilities for 174 people, or when buffet meals are pro-vided, 400 people. The dining-supper room can be incorporated within the Club for special occasions, in-creasing normal dining ac-commodation to 244 people and buffet accommodation to 500 people. There will also be a bar and lounge.

lounge.

SAFETY NOTES

Fibre Glass Fume

Hoods

Because of their compact de-sign and low cost, fibre glass hoods and exhaust fans have been installed in a number of Australian laboratories, includ-ing several in CSIRO.

Fibre glass impregnated with Polyester resin is classed with polyester resin is classed by the American Society for Testing Materials codes as "self-extinguishing" and its fire re-sistant properties can be im-proved by mixing additives such as antimony trioxide with the resin. the resin.

the restn. However, recent experience by the Commonwealth Fire Board and CSIRO has shown that fibre glass readily absorbs some oxidising agents, for example perchloric acid, par-ticularly where the surface finish is rough.

Under these circumstances the resin becomes highly in-flammable and there have been several cases of fires destroy-ing fibre glass fume cupboards. Fortunately none of these fires occurred in CSIRO labora-tories tories.

It is now the policy of the Organisation not to install fibre Organisation not to install fibre glass fume hoods; however, in those laboratories where fibre glass fume hoods are already installed, would-be users should first familiarise themselves with Common-wealth Fire Board Circular Number 54, "Fibre Glass Fume Hoods — Fire Precau-tions".

Copies of this circular may be obtained on application to Head Office

J. W. Hallam, Safety Officer.

written, fortunately by two people most closely involved in the work. laboratory study, now con-sidered classical, on the epi-demiology of the mouse virus, ectromelia — a laboratory model, so to speak, of the myxoma field experiment.

...... Dr. M. F. Day, Assistant Chief of the Division of Entomology reviews "Myxomatosis" by F. Fenner and F. N. Ratcliffe. Published by Cambridge Uni-versity Press, 1965. Pp. 379. *****

The results of the introduc-tion of the virus were un-expected, and it is easy to forget how dramatic were the happenings at that time. No other single event did more to make the name CSIRO known to Australians.

to Australians. Within a few months the Organisation changed in the minds of many members of the community from the saviour of the nation to a killer of men, for the epidemic un-happily coincided with an out-break of Murray Valley encephalitis, also carried by mosquitoes — a disease which unfortunately claimed a num-ber of lives.

It was only when Sir Mac-Farlane Burnet, Sir Ian Clunies Ross and Professor Fenner were inoculated with myxoma virus and did not develop any symptoms that the populace was ready to concede that the

two pathogens were different entities.

No other single activity of CSIRO had such an impact on the economy of the country as did the introduction of myxoma virus. Ratcliffe has made an assessment of this impact but omitted the one feature which to my mind is more important than any he has listed: this is the effect of the rabbit on soil erosion.

the rabbit on soil croston. Other factors, particularly improvements in soil conser-vation methods, were also in-volved in reducing soil erosion but these alone would have been powerless to bring about the great improvements of the last fifteen years if rabbit numbers had remained as they were in 1949.

Were in 1949. Probably the most important feature of this book is that it records the evolutionary changes of a lethal virus and its host from the moment of contact, not only in Australia but in much of Europe. Such a situation is unlikely to arise again again.

If it does, it will be fortu-nate if it can be as well documented as this one. It is because the evolution of myxomatosis has been so thoroughly studied that this book by Fenner and Raicliffe will remain a classic in its fead field.

New Appointees

Mr. B. C. Loft has joined the Division of Applied Miner-alogy where he will study mineral-organic complexes and the influence of minerals on organic reactions. Since grad-uating B.Sc. from the Uni-versity of Melbourne in 1958,



Mr. Loft has been a research officer in the polymer section of I.C.I.A.N.Z. During 1961-62 he studied light scattering by solid polymer films at the University of Massachusetts.

Mr. R. A. Challinor will arrive in Australia this month to join the Upper Atmosphere Section. Since graduating B.Sc. with honours from the University of London in 1962, Mr. Challinor has been under-taking research at the Uni-Mr. Chalinor has been under-taking research at the Uni-versity on the effect of the ionosphere on the propagation of V.L.F. radio waves.

of V.L.F. radio waves. Mr. G. E. Moreton has been appointed as Research Asso-ciate with the Division of Physics and will take part in the Division's solar flare pro-gramme. From 1955 to 1958 Mr. Moreton was a research scientist at Convair, Pomona, California, and from 1958 to 1963, Director of the Lock-heed Solar Observatory in California. In 1964 he oc-cupied research and lecturing posts in the United States and Europe, and last year he was an American exchange scientist at the Crimean Observatory in the Crimean Observatory in

Dr. D. Morris has been ap-Dr. D. MOTTIS has been ap-pointed to a Research Fellow-ship in Radioastronomy with the Division of Radiophysics. Dr. Morris graduated B.Sc. with honours from the Uni-



Dr. D. MORRIS

versity of Manchester in 1955 and Ph.D. from the same uni-versity in 1959. He then spent four years at the California Institute of Technology work-ing in a dispertencement. ing in radioastronomy.

ing in radioastronomy. Mr. E. R. Osmotherly has joined the Division of Coal Research as Divisional En-gineer. He will work on the design, testing, and operation of technical-scale gasification and combustion plant and on the development of scientific equipment. Mr. Osmotherly obtained his Diploma of Mechanical Engineering from Sydney Technical College in 1954. From 1939 to 1955 he worked with the New South Wales Railways Department and from 1955 to 1962 with the Clyde Engineering Com-pany. For the last three years

he has been project engineer with the Australian Atomic Energy Commission at Lucas Energy Heights.

Mr. V. Radhakrishnan has Mr. V. Radhukrishnan has been appointed to a Research Fellowship in Radioastronomy with the Division of Radio-physics. After graduating B.Sc. with honours from the Uni-versity of Mysore in 1956, Mr. Radhakrishnan worked firstly at the Department of Physics of the India Institute of Science at Bangalore and then



Mr. V. RADHAKRISHNAN

in the Design and Develop-ment Laboratory of British Acoustic Films Ltd. in London. From 1956 to 1963 he carried out research in radioastronomy at the Chalmers Institute of Technology at Gothenburg, Sweden, and at the California Institute of Technology.

Mr. G. J. Tupper has joined the Division of Plant Industry. He will work at the Riverina Laboratory. Deniliquin, on the



feasibility of feed carry-over drought periods and the of special purpose pastures for use

9



VOYAGE OF THE 'CYGNUS-A' THE

After a 16,000 mile voyage in a 35-foot trimaran, radio-astronomers Mr. V. Radhakrishnan (the owner-skipper of the boat) and Dr. D. Morris arrived in Sydney recently to take up research fellowships at the Division of Radiophysics (see "New Appointees").

in dryland management sys-tems. After graduating B.Agr.Sc. from the University of Melbourne in 1959 and Dip.Ed. in 1960, Mr. Tupper taught in New Guinea for two years. He joined the Victorian Department of Agriculture in 1962 and has spent the last three years as a lecturer at Dookie Agricultural College.

Mr. R. N. Walker has been appointed to the Computing Research Section to assist users of the Sydney Control Data 3200 computer with their programming problems. Mr. Walker graduated B.Sc. from the University of Melbourne in 1959 and Dip.Ed. in 1960. He taught mathematics for He taught mathematics for years and for the last years has been a comtwo three programmer with the South Wales Public puter New Service Board.

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The boat, "Cygnus-A", was designed in California and built in England. It has a beam of 20 feet and a draft of 2 feet 6 inches.

Neither Mr. Radhakrishnan nor Dr. Morris had a great deal of experience of sailing small boats before setting out for Australia.

To get it they sailed along the east and south coasts of England and then to the Channel Islands, the coast of Brittany, Coruna and Vigo in Spain, Casablanca, and Las Palmas in the Canary Islands.

They then sailed 2,800 miles to the West Indies. This leg of the voyage took 26 days, their longest period at sea.

On the voyage from England to the West Indies they were accompanied by another radio-astronomer, Mr. D. Harris.

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Mr. Harris left the boat in the West Indies, and Mr. S. Shaw was taken on board for the rest of the voyage as the third member of the crew.

After visiting more than a dozen islands in the West Indies and inspecting the huge Indies and inspecting the huge Arecibo radio telescope at Puerto Rico, they passed through the Panama Canal into the Pacific Ocean where their route to Sydney took them through the Galapagos Islands, Marquesas Islands, Tuamotu Archipelago, Tahiti, Leeward Islands, Cook Islands, Samoa, Fiji and New Caledonia.

They arrived in Sydney some eighteen months after setting sail from England.

The longest stretch of ocean - 3,000 miles from Galapagos to the Marquesas-was covered in 21 days as a result of good winds and favourable currents.

Mr. Radhakrishnan claims that the most nerve-wracking experience of the whole trip was their passage through the Panama Canal.

The water rushing in to fill the locks and the wash from the propellers of the big ships caused tremendous turbulence which tended to dash them against the stone walls of the locks.

Although they occasionally met with rough weather, they never ran into any storms.

Their biggest hazard at sea was the risk of collision with steamers when in shipping lanes, making it necessary to have someone on watch at all times.

Our picture above shows Dr. Morris and Mr. Radhakrishnan on board the "Cygnus-A". Fully constructed of marine plywood and sheathed in fibre glass, she is ketch rigged and carries 400 square feet of sail. The outriggers provide storage for water, sails, lines, and much of the gear that is normally stowed in the forepeak of a conventional yacht. Our picture above shows Dr.

"How touching! It wants to give a pint of blood." Copyright "Punch". , innexes management and a second and a second and a second second second second second second second second secon

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DAY FOLLOWS KNIGHT ON EXECUTIVE

Dr. M. F. Day, B.Sc., Ph.D., F.A.A., Assistant Chief of the Division of Entomology, has been appointed to the Executive. Dr. Day fills the vacancy created by the resignation of Sir Otto Frankel, who leaves for Rome shortly on an F.A.O. assignment.

After graduating B.Sc. with honours, at the University of Sydney, Dr. Day joined the Division of Entomology in 1938 to take part in research on termites.

A few months later he was A few months later he was granted leave to work at Har-vard University where he sub-sequently obtained his Ph.D. He resigned from CSIRO in 1940 to become Lehman Fellow at Harvard. During 1941-42 he lectured at Washington Uni-versity. Missouri. versity, Missouri.

Dr. Day then spent a year with Australian War Supplies Procurement in Washington where he assisted with the pur-chase of scientific equipment.

In 1944 he rejoined CSIRO as a member of its Scientific Liaison staff in Washington and two years later he returned to the Division of Entomology.

In 1955 he was seconded for two years to act as Liaison Officer in Washington and in 1963 he was appointed Assistant Chief of the Division.

Dr. Day, who was elected a Fellow of the Australian Academy of Science in 1956, is one of Australia's leading Fellow is one of biologists.

His early work in entomology dealt with respiration, hor-mones and insect digestion.

In the early 1950's his inter-ests shifted to the relationship of viruses with insects — the



Dr. M. F. DAY

mechanism of transmission and replication in the insect of plant and animal viruses and the occurrence, specificity and de velopment stages of viruses that cause diseases of insects. Dr. Day has made important

contributions to the understand-ing of the transmission mech-anisms of myxomatosis and of a number of plant viruses.

In addition to his research activities, Dr. Day is particu-larly interested in nature con-servancy. He is Chairman of the Academy of Science Com-mittee on National Parks and has played an active role in the establishment of the Australian Conservation Foundation.

Sir OTTO FRANKEL

publication and information etrieval

He is Chairman of the Committee of the Adolph Basser Library for the History of Australian Science, and a member of the Board of Standards of the Australian Journals of Scientific Research.

Developing The North

Research was essential to estab-lish priorities and sound policies for northern develop-ment, said Mr. C. S. Christian of the Executive, last month.

of the Executive, last month. Mr. Christian, whose paper was read to the North Australia Development symposium in Sydney in his absence, said that work at northern research stations had shown generally that there was technically no reason why agriculture in north Australia should not be productive in selected localities, either under irrigation or natural rainfall natural rainfall.

But there had been dis-appointing results as well as promising ones— of which the most notable had been rice.

The economic environment in which agriculture developed could change rapidly and could be changed deliberately by gov-ernment action.

"This is particularly true of undeveloped areas. The estab-lishment of services can modify this environment by changing costs of supplies and by facili-tating marketing", he said.

"Government policies can have a major influence on in-centives and the development of complementary industries in a region can have major reper-cussions."

cussions." "Research for development in hitherto undeveloped regions proceeds for many years in most instances before develop-ment can proceed." "It has been in progress on the Ord and at Katherine for 20 years."

Sir Otto Frankel, who has been a member of the Executive for the past four years, has resigned to resume his research in genetics and to broaden his activities in international science.

Sir Otto will leave for Rome early this month to take up a short term appointment as a consultant to the Food and Agriculture Organization of the United Nations.

He will also undertake a com-mission for the Agricultural Research Council in Britain. Before joining CSIRO in 1951 Sir Otto had established him-self as a brilliant geneticist and an experienced administrator.

He was born in Vienna and obtained a doctorate in agri-culture in 1925 from the Insti-tute of Genetics in Berlin.

After carrying out research in Czechoslovakia, Israel and Great Britain, he went to New Zealand in 1929 to join the Wheat Research Institute of the Department of Scientific and Industrial Research.

During his 22 years in New Zealand, Sir Otto made out-

current.

standing contributions to science and to the welfare of the country's wheat industry. He was associated with the breed-ing of every variety of wheat now being grown in New Zealand Zealand.

In 1942 he became Director of the Wheat Research Institute and in 1949 Director of D.S.I.R.'s Crop Research Division.

sion. In 1951 Sir Otto came to Australia to lead CSIRO's largest research division, the Division of Plant Industry. Under his leadership the Divi-sion developed as one of the world's foremost centres for plant research.

He attracted research workers He attracted research workers of the highest calibre to his laboratory in Canberra, and built up strong teams of scientists working in all the important fields related to plant production.

Sir Otto was instrumental in planning many new research ventures for the Division, in-cluding CERES, a laboratory for plant research under con-trolled climate conditions.

He was appointed to the Executive in 1962. Among Sir Otto's many scientific honours and distinc-tions are a doctorate of science from the University of New Zealand and a Fellowship of the Royal Society of New Zealand. Zealand.

His outstanding contributions to the science of genetics were recognized by his election to a Fellowship of the Royal Society of London in 1953.

He is a Fellow and former Vice-President of the Australian Academy of Science and was a member of the Council of the Australian National University.

He was elected a Fellow of the World Academy of Art and Science in 1965.

Earlier this year Sir Otto was created a Knight Bachelor in the New Year's Honours List "in recognition of his outstand-ing public service in the fields of plant research and biology".

Sir Otto has always been interested in the international aspects of plant science. He was an Australian delegate to the 1959 F.A.O. Conference, and he is a member of the research committee of the F.A.O. "Freedom from Hun-ger" campaign. F.A.O. "Freed ger" campaign.

He is also Convenor of the Australian National Committee for the International Biological ogramme.

NCE VISTS

While in Cauberra last month, on his way to school in Victoria, Prince Charles visited the Division of Wildlife Research at Gungahlin where he was shown around by the Chief of the Division, Dr. H. J. Frith. The Prince was par-ticularly interested in the kangaroos and was shown several one-day-old kangaroos in their mothers' pouches. During the tour, which lasted one and a half hours, he also saw caged wedge-tailed eagles, Tasmanian native hens, and a wide variety of Australian waterfowl. Prince Charles showed great interest in a collection of stuffed birds and mammals of Australia and New Guinea. He is shown above examining the collection with Dr. Frith. New Guinea. with Dr. Frith.

POSITIONS VACANT

The following vacancies for professional appointments are

CHITCHI.
 RESEARCH SCIENTIST (R.S.S.R.S) — RADIOCHEMIST — Division of Animal Physiclogy 245/149 (1)/3/66).
 RESEARCH SCIENTIST (R.S.S.P.R.S) — PLANT BIOCHEMIST/ PHYSIOLOGIST — Division of Food Preservation 300/422 (1)/3/66).
 RESEARCH SCIENTIST (RS.S.P.R.S.P.R.S.P. RESEARCH LEADER — Division of Plant Industry 132/155 (1)/3/66).
 RESEARCH SCIENTIST (RS.S.R.S.) — COMBUSTION OR CHEMIST (ALL POGINEER — Division of Coal Research 480/504 (18/3/66).
 RESEARCH SCIENTIST (RS.S.P.R.S.) — COMBUSTION OR CHEMIST (ALL POGINEER — Division of Coal Research 480/504 (18/3/66).
 RESEARCH SCIENTIST (RS.S.P.R.S.) — COMBUSTION OR CHEMIST (ALL POGINEER — Division of Coal Research 480/504 (18/3/66).

Dr. Day is also interested in the general field of scientific

NORTH WEST FRONTIER

There are three ways of getting to Kununurra, the little town on the Ord River in Australia's far north-west. You can set out from Perth by car and drive like a madman for about four days.

You can travel from Katherine over a bumpy road, hoping that your car will survive the ordeal. Or you can go in comfort, in a MacRobertson Miller Friendship.

From the air, you see the Kimberley Research Station long before you see Kununnra. The neat chequerboard pattern of pale greens, dark greens and browns stands out vividly against the monotonous background of the bush.

As the plane comes overhead, Kununurra itself is seen, a neat pattern of tree-fringed crescents flanked by white bungalows, about ten miles from the research station.

It has a club, a garage, a couple of stores, a hotel-motel, a post-office, a police station, and a population of 250. Five years ago it didn't exist. It is the newborn child of research and investment. The research began in 1947. CSIRO and the Western Australian Department of Agriculture agreed in 1946 to establish the Kimberley Research Station.

The Station

The Station was built on a beautiful site on a cliff overlooking a big bend in the Ord River. It contains about a dozen houses, single mens accommodation, several laboratories, and an office.

On the banks of the river, wading in the shallows, are flocks of brolgas. Occasionally a Johnson River crocodile can be seen sunning itself on the bank.

The species is harmless, and the "old hands" on the station don't worry about them.

The bird life is abundant and extremely noisy. Huge flocks of corellas (white cockatoos) perch in the trees along the river bank every afternoon, shrieking constantly. The station land is typical of a potentially irrigable area of some 150,000 to 200,000 acres. The diversion dam completed in 1963 provides irrigation water for over 20,000 acres, an area sufficiently large to establish a pilot-scale agricultural settlement. The ambition of the settlers

The ambition of the settlers is to see a big dam built to provide irrigation water for the whole region. The proposed dam will contain seven times the volume of water in Sydney Harbour.

Harbour. The cost of running the station is shared between the Commonwealth Government and the Government of Western Australia. The overall policy and the program of work are controlled by joint committees. The aim of the station has

Controlled by joint committees. The aim of the station has been to discover a basis for agricultural settlement of the region. Over the years, experiments have been carried out with a wide range of crops, including cotton, rice, cereals, sugar-cane, oilseed and fodder crops.

Many of these crops have grown well, but economic limitations have loomed as threats to development.

In the case of sugar, for example, a very large acreage has to be planted to supply one mill. And the Queensland mills already established can normally supply Australia's markets.

markets. Economic situations change, and the time may come when sugar will be grown commercially on the Ord. Meanwhile, research into the agronomy of sugar cane continues under the supervision of a scientist from the Colonial Sugar Refining Company, who lives on the station.

Cotton is King

The most promising economic crop, and the basis of present development, is cotton. Aus-

Left: A fine stand of sugar cane growing on the station. The Colonial Sugar Refining Co. is taking an active part in the work on sugar. Below: A chartered helicopter

Below: A chartered helicopter is used for spraying the cotton crops.





Above: An entomologist examining damage done to cotton plants by Prodenia.

tralia imports most of its cotton, although a little is grown in the Murrumbidgee Irrigation Area.

This year there are 25 farms, each of about 600 acres, growing cotton as their principal crop.

Research on cotton is chiefly concerned with agronomy and the control of weeds and pests. One of the problems has been to find the most suitable cotton variety.

Since 1958 the station has tried over 100 varieties introduced from Africa, Argentina, India, Pakistan, U.S.A., and U.S.S.R.

Vield is one of the main criteria for selection, but disease resistance and fibre quality are also important. A difference in fibre length of only 1/32 of an inch can be an important quality factor.

A pronounced upward trend in the general yield level of the cotton experiments has occurred in the last year. Several varieties have yielded three bales of lind to the acre, a figure which would have seemed remarkable only a few years ago.

There are a number of insect pests of cotton, but the most important one is the caterpillar, *Prodenia*. In bad years, *Prodenia* has been responsible for losses of up to 30% of the crop.

It can be controlled by the insecticides "Edrin" and "Bidrin", but these are broadspectrum insecticides which also kill the natural parasites and predators of *Prodenia*.

Research on the life history and ecology of *Prodenia* has shown that the insect might be eliminated if the whole area could be cleared of cotton and other broad-leafed crop plants for a period of three weeks.

This was tried last season, but larvae of the insect managed to survive on pigweed and phasey bean. For the time being, at least, cotton growers will have to continue with heavy spraying programmes.

Control of weeds is also of importance in cotton growing, Work at the station is aimed at finding out what concentrations of which herbicides are most effective against various weeds. And, as in the pest control programme, the strategy of use and optimum times of application are being studied.

Other Crops

Some of the land in the Kimberley is too flat to grow cotton — there is not enough fall to allow water to flow in the furrows. Two or three thousand acres of already developed flat farmland are suitable for rice growing.

A local farmer grew 200 acres of rice last year, and made a profit. Others would like to follow suit.

At the Coastal Plains Research Station there is a suitable rice variety available, but there is no control of water. On the Ord, the situation is reversed — it is a suitable variety that is needed.

Finding the right variety is one principal condition of success. Overcoming bacterial blight is another.

Good wheat can be grown at the station under irrigation. The costs of fertilizer and freight are so high that growers must obtain a yield of 56 bushels to the acre to break even.

Yet experimental plots have yielded as high, and higher than this, so profitable crops may be grown.

The wheat has a remarkably high protein content, and could command premium prices in specialized markets.

Safilower and linseed have been grown successfully as oilseed crops, but they don't appear to have any immediate commercial future.

Much more promising is the programme on fodder crops, Sorghum varieties have been grown which produce several cuts of fodder. After two cuts the yield of fodder has been as high as 9 tons of dry matter per acre.

With the aid of various legumes, including the native *Sesbania*, pasture improvement practices are being developed.

The ubiquitous Townsville lucerne, which has been so successful in other parts of the north, is to be tried.

In the little town of Kununurra, expectation hangs in the air. There is a tremendous aura of optimism, a feeling that the region has a wonderful future.

If the Kimberley Research Station can keep up the good work if has started, there seens to be no doubt that this optimism will prove to be justified.

News in Brief

H. G. Smith Medal

Dr. A. D. Wadsley of the Divi-sion of Mineral Chemistry has been awarded the H. G. Smith Memorial Medal of the Royal Australian Chemical Institute for 1965

Professor

Mr. J. A. Mabbutt of the Divi-sion of Land Research has been appointed Foundation Professor of Geography at the University of New South Wales.

Lecturer

Dr. B. G. Baker of the Divi-sion of Tribophysics has been appointed senior lecturer in chemistry in the School of Physical Sciences, University of Adelaide, Bedford Park.

Institution Member

Dr. L. S. Williams of the Divi-sion of Applied Mineralogy has been elected a Member of The Institution of Engineers, Australia The Inst Australia

Doctorate

Mr. A. D. Donald of the Divi-sion of Animal Health has been awarded the degree of Doctor of Philosophy by the Univer-sity of Bristol.

Screen News

The Food Preservation Film Society will screen "On the Waterfront" at 7.30 p.m., Tues-day, March 15, at the Division's Hicks Meeting Room, North Rvde Ryde.

The 314 Film Society will screen "Silent Wives", a silent film made in America in 1922, at 8.00 p.m., Thursday, March 17, at Head Office.

Convocation Member

Mr. C. S. Christian of the Executive has been admitted as a member of the Convocation of Macquarie University.

Visitor

Dr. J. Rehacek of the Institute of Virology of the Czecho-slovak Academy of Sciences is spending twelve months with the Division of Entomology working on tick tissue cultures.



His visit has been made pos-sible by a grant from the U.S. Public Health Service.

Science Writers' Tour

Science Writers' Tour A party of eight British science writers will arrive in Sydney on March 6 on a three week visit of Australian scien-tific research centres. The visit has been arranged by CSIRO, Qantas, the News and Information Bureau, the Australian National Travel As-sociation, and the Departments of Supply and Immigration. Those taking part in the tour are Mr. Ronald Bedford (Sun),



Why Be Short Sighted?

Some people seem reluctant to wear safety glasses. The usual reasons offered are that they cannot see as well with them and that the spectacles damage their eyes.

This problem reached such proportions in one Common-wealth Department, that the advice of Dr. Kelvin Lidgett was sought.

Har bolgett, the Commonwealth Medical Referee and Honorary Consultant Opthalmic Surgeon at the Royal Victorian Eye and Ear Hospital, made the following

- The wearing of plano spectacles does not cause any damage to vision.
- Carnage to vision. Plano spectacles do not reduce visual acuity. Spectacles, like windscreens of motor vehicles should be kept clean. As a general rule patients requiring corrective spectacles should be re-examined every two to three years. In the case of young people, 16-22 years of age, who are short sighted, re-testing for corrective spectacles may be neces-tive year. sary every year.
- The overwhelming advantages of protective spectacles is such that all persons exposed to industrial eye hazards should be encouraged to wear such spectacles at all times. The reduction of eye damage and loss of vision both partial and complete as a result of protective spectacles has been tremendous.
- The minor inconvenience of wearing spectacles is trivial compared with the increased safety such protective spectacles provide.

Dr. Lidgett's statement should be enough to convince everyone that proper eye protection can be safely worn, and should be worn at all times when there is any possi-bility of exposure to an eye hazard.

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J. W. Hallam, Safety Officer.



Last month the Governor-General, Lord Casey, made a series of visits to CSIRO laboratories in Canberra. It was the first time Lord Casey, a former member of the Executive, had visited CSIRO in his new capacity. He is shown above being greeted on arrival at the Division of Eutomology by Sir Frederick White and the Chief of the Division, Dr. D. F. Waterhouse.

Mr. C. L. Boltz (Financial Times), Mr. Nigel Calder (New Scientist), Mr. Robin Clarke (Science Journal), Dr. A. R. Michaelis (Daily Telegraph), Mr. Bryan Silcock (Sunday Times), Mr. A. Smith (Daily Mirror) and Mr. Anthony Tucker (Guardian). Because of the limited time

Because of the limited time, the visit will be largely con-fined to New South Wales, A.C.T., South Australia and Victoria.

Queen Elizabeth Fellows

Two recent recipients of Queen Elizabeth Fellowships awarded by the Commonwealth Govern-ment have begun work with the Division of Entomology at Canberra. Both Fellowships

Dr. A. C. S. Crossley will work in the fields of tissue culture, endocrinology, and bio-chemistry. Dr. Crossley ob-



tained his Ph.D. from Cambridge in 1963 where he worked on insect physiology and biochemistry with Professor Wigglesworth. He has spent the last two years at the Uni-versity of Virginia working on the cytology and physiology of insect development with par-ticular reference to blowflies.

Dr. J. A. L. Watson will work on the endocrinology of insects. Dr. Watson graduated B.Sc. from the University of Western

Dr. J. A. L. WATSON

Australia and obtained his Ph.D. at Cambridge in 1962. For the last three years he has been engaged in research at the Western Reserve University, Ohio.

Bad News for Transistor-phobes

In last month's "Coresearch" In has months consecution we quoted a suggestion made in the Editorial column of the "Canberra Times" that CSIRO take on the transistor as it did the rabbit.

the rabbit. Now a colleague in the Ore-Dressing Investigations Section reports that a team of well-intentioned electronics experts at Melbourne University has devised an oscillator the size of a matchbox which causes nearby transistors to emit a high-pitched tortured wail.

One would have thought that One would have thought that this marked the introduction of an era of comparative peace in trams and trains and on the beach. But like many a new-born product of research which performs obligingly and with admirable efficiency in the lab-oratory, it failed to live up to the fond hopes of its creators when tried in the field.

Exhaustive tests in many a public place led to the horrify-ing conclusion that those un-

fortunate addicts who fear to move in public without a transistor clutched desperately to their ear are either uncon-cerned at the fiendish screams induced by the oscillator or else cannot distinguish them from any one of the top five hundred. But whetherer the explana

But, whatever the explana-tion of this aberrant behaviour, the results were unequivocal not one person on which the oscillator_was_tried_could be induced to switch off his trans-istor.

Overseas Visits

Mr. K. Grant of the Soil Mechanics Section left last month on an eight week visit to Britain, the United States, Japan and Thailand where he will visit research centres and have discussions on terrain evaluation for engineering. Dr. J. J. Kowalczewski of the Division of Mechanical En-gineering will return later this month from an eight week visit to the United States and Britain where he has been discussing

where he has been discussing two-phase flow research. While in the United States, Dr. Kowalczewski delivered a paper at a meeting of the American Society of Heating, Refrigera-tion, and Air-Conditioning Engineers.

and microfield the optimized of the description of the de

New Zealand Society of Animal Production and the New Zealand Veterinary Association. Dr. Morley visited research centres in both North and South Islands and gave a num-ber of lecures. Mr. R. N. Morse, Chief of the Division of Mechanical Engineering, leaves shortly on a two month visit to the United States, Britain, Greece and India where he will have dis-cussions on phytotron cabinets, air-conditioning, and utilisation of solar energy. of solar energy.





Dr. F. J. Bromilow has joined the Building Operations and Economics Section of the Division of Building Research. Bromilow graduated B.Sc. 1945, M.Sc. in 1947, and



Dr. F. J. BROMILOW

Ph.D. in 1952, all from the University of Melbourne. He joined the Gas and Fuel Cor-poration of Victoria in 1953 and for the last eight years has worked on operations research.

Dr. D. P. Drover has been appointed to the Division of Land Research where he will study factors affecting soil permeability. Dr. Drover graduated B.Sc. with honours from the University of Sydney



Dr. D. P. DROVER

in 1949 and Ph.D. from the University of Western Australia in 1954. After lecturing in soil science at the University of Western Australia for ten years he was appointed Professor of Biochemistry and Soil Science at the University of Khartoum in 1960.

Miss M. J. Heath, who graduated B.Sc. with honours from the University of New South Wales last year, has been appointed to the Division of Animal Health. Miss Heath will work at the MacMaster Laboratory, Sydney, on bio-chemical aspects of sheep dis-eases.

Mr. I. Machine-Ross has joined the Division of Mech-anical Engineering where he will study heat and mass trans-fer and its inter-relation with



Mr. I. MACLAINE-ROSS

novel cooling systems being de-veloped by the Division. Mr. Maclaine-Ross graduated B.Mech.E. with honours last year from the University of year from Melbourne.

Dr. R. S. McCullough arrived in Sydney last month from Canada to join the Division of Mathematical Statistics. He will be concerned with statistical aspects of the National Stand-ards Laboratory's research pro-gramme. Dr. McCullough graduated B.A. from the Uni-versity of Toronto in 1956 and M.A. from the same University in 1957. He obtained his Ph.D. from Iowa State University in 1961 and for the last five years has been Operational Research Analyst with Canadian National Railways. Dr. R. S. McCullough arrived Railways.

Mr. E. J. Middleton has been appointed to the Division of Organic Chemistry where he will work on the isolation, structure determination, and synthesis of biologically active natural products. Since graduat-ing B.Sc. with honours from



the University of Western Aus-tralia in 1958, Mr. Middleton has been a research assistant in the University's Department of Organic Chemistry.

Mr. I. P. Parer, who gradu-ated B.Agr.Sc. with honours recently from the University of Queensland, has been appointed to the Division of Wildlife Re-search where he will study the ecology of the wild rabbit.

Mr. A. K. Shipway, who graduated B.Sc with honours last year from the University of Sydney, has joined the Divi-sion of Wildlife Research. Mr. Shipway will study the ecology of the dingo in the Harts Range porth east of Alice Springe north-east of Alice Springs.

Mr. E. H. Ridge has been appointed to the Division of Solis where he will study micro-organisms which colonize wheat roots and their effects on the growth of the plant. Mr. Ridge graduated B.Sc. from the Uni-versity of Melbourne in 1961

and for the last five years has been a virologist with the National Biological Standards Laboratory of the Department of Health



Mr. G. T. Sibley has been appointed to Head Office where he will assist in the scientific administrative activities of the Agricultural and Biological Sciences Branch. Mr. Sibley graduated B.Agr Sc. from the University of Melbourne in 1955 and for the last ten years has been carrying out land use surveys with the Soil Conserva-tion Authority of Victoria.



Mr. G. T. SIBLEY

Mr. J. L. Varley, a recent science graduate from the Uni-versity of New South Wales, has joined the Division of En-tomology's Sirex Research Unit at Hobart. Mr. Varley will be concerned with the propagation, liberation and recovery of Sirex parasites throughout Tasmania and with the evaluation of their status status

Dr. S. Twomey has been appointed to a Research Fel-lowship in cloud physics with the Division of Radiophysics. Dr. Twomey graduated B.Sc. with honours in 1947, M.Sc. in



INVIE AVS

the cloud physics group of the Division of Radiophysics from 1950 until 1959 when he left to take up an appointment with the U.S. Weather Bureau in Washington. Dr. Twomey is currently employed with the U.S. Naval Research Labora-tory tory.



Miss Irene O'Keefe of the Division of Textile Industry was recently awarded the E. H. Williams Prize for the best textile thesis submitted at the Gordon Institute of Technology in 1965. Miss O'Keefe, who completed the requirements for her Diploma of Textile Chemistry Inst year, is shown being congratulated by Mr. R. J. Hine (left), Mr. K. Hopper, and Mr. M. Goldsmith.

Mr. C. R. Kleinig, acting Ollicer-in-Charge of the Divi-sion of Plant Industry's Riverina Laboratory, was killed in an aircraft accident at Den-

In an alternit accident in Den-iliquin on January 31st. Mr. Kleinig graduated B.Ag.Sc. with honours from the Univer-sity of Adelaide in 1951 and was appointed lecturer at the Waite Agricultural Research Institute. Institute

With Mr. J. Harris he investi-gated the unsatisfactory growth of legumes in the ironstone soils of the south-east of South Australia. This work led to techniques for the successful establishment of pastures.

In 1954 he joined the late Dr. B. Horowitz in the Divi-sion of Plant Industry's Oil Crops Section and played a leading part in the establish-ment of the safflower industry.

He transferred to the River-ina Laboratory in 1957 where he played a dominant role in a wide range of the laboratory's work.

It is freely acknowledged by his colleagues that much of the success of the Riverina Labora-tory in agricultural research was due to Mr. Kleinig's work.

At the time of his death he had almost completed many of the research projects he had undertaken at Deniliquin.

Much of this work will be published for him by his col-leagues, but his permanent memorial will be the techniques he introduced into the Riverina and which are now being applied with great vigour by the industry. the industry.

Australia can ill afford to lose such a productive research worker in agriculture.

Mr. Kleinig had friends in all walks of life, but his col-leagues in CSIRO will feel a deep personal loss.

They will miss his helpfulness and sound judgement. They will remember him with pleasure and with pride in his achievements.

Printed by CSIRO, Melbourne





GREGORY TO DI

2nd Fourth Australian General

through

Hospital and served the siege of Tobruk.

Dr. T. S. Gregory will retire from the Organization this month after six years as Chief of the Division of Animal Health.

Dr. Gregory, who is one of Australia's leading veter-inary bacteriologists and epidemiologists, graduated B.V.Sc. with honours from the University of Melbourne in 1923.

After two years' private prac-tice in New Zealand, he joined the C.S.I.R. where he carried out research on caseous lymphadinfixation test for contagious bovine plenropneumonia, and bovine tuberculosis.

In 1929 he resigned to become In 1929 he testinet to become senior lecturer in bacteriology at the University of Melbourne. He gained his Diploma in Bac-teriology from the London School of Hygiene and Tropical Medicine in 1935.

Two years later he rejoined C.S.I.R. and commenced work on footrot in sheep.

These investigations were interrupted in 1940 when he enlisted in the A.I.F. He be-came a bacteriologist with the



Dr. T. S. GREGORY

the 2nd Third Australian Mobile Bacteriology Laboratory.

In 1943 he joined L.H.Q. Medical Research Unit in Cairns and at the end of the war he was discharged with the rank of Major.

Dr. Gregory returned to C.S.I.R. in 1946 and began work once more on bovine tuberenlosis.

He also commenced his in-vestigations into brucellosis and these led to the eventual wide adoption of strain-19 vaccina-

adoption of strain-19 vaccina-tion in Australia. In 1953 he was awarded the degree of D.V.Sc, by the Uni-versity of Melbourne for his studies on infectious diseases of sheep and cattle.

of sheep and cattle. The following year he was appointed Officer-in-Charge of the Animal Health Research Laboratory at Parkville, Mel-bourne, and in 1959 he be-came Chief of the Division of Animal Health Animal Health.

Over the years, Dr. Gregory has taken an increasing interest in scientific aspects of main-taining Australia's freedom from major infectious diseases of livestock.

He has also been particularly concerned with the develop-ment in Australia of the facilities, knowledge, and plans needed for the prompt diag-nosis and eradication or control of any disease which might slip through quarantine barriers and threaten the national economy.

Move from Cunnamulla

The Division of Animal Genetics is to transfer its sheep selection experiment at "Gilruth Plains", Cunnamulla, Queensland, to its experiment station "Longford" near Armidale, New South Wales.

The move, which will take place next year, is being made in order to speed up the experiin order to speed up the experi-mental programme and to enable the research staff to maintain closer contact with their colleagues both in CSIRO and in universities and State government departments. "Gilruth Plains" was estab-lished in 1937 and during the station's first ten years much of the work was concerned with control and prevention of blowfly strike in sheep. The main technique used

The main technique used was the modified Mules opera-tion supported by a tail strip operation and by crutching as required.

The station's present breed-ing programme, which began in 1947, has been concerned prin-cipally with selection for wool production.

Research has shown that the rate of improvement from generation to generation can be increased and that sub-stantial gains in productivity can be achieved in flocks by selection based mainly on wool weight weight.

ese investigations reached a stage have where These now

NEW LABORATORY FOR BRISBANE

they can be moved without losing information.

At Cunnamulla, where sheep are run in large paddocks at one sheep to seven acres, mustering has been a major mustering h undertaking.

At "Longford", on the other hand, it will be possible to run the sheep on country which can be much more closely stocked so that they are closer to hand for experimental treatment and observation.

It is hoped also that drought, which has prevented experiwhich has prevented experi-mental mating at Cunnamulla in three years out of the last eight, will be a less frequent cause of interruption in the higher rainfall area.

The move from Cunnamulla to Armidale should not affect the applicability of the breed-ing programme, since the in-vestigations are concerned with the general principles of sheep genetics.

The Executive is now con-sidering how "Gilruth Plains" might be used when the sheep selection experiment is transferred.

F.R.S. for Chairman

The Chairman, Sir Frederick White, has been elected to a Fellowship of the Royal Society for his work in radiophysics and radar and for outstanding contributions to the development of Australian science.

Sir Frederick first became asso-ciated with CSIRO during the war when he was Professor of Physics at Canterbury Univer-sity College, New Zealand.

In 1941 he was given leave by his University to assist C.S.I.R.



physics. Sir Frederick resigned his professorship in 1945 and became Associate Executive Officer of C.S.I.R.

He was appointed a member of the Executive Committee of the Council in 1946.

death of Sir Ian Clunies Ross. Sir Frederick was elected a Fellow of the Australian Academy of Science in 1960 and was created a Knight Com-mander of the Order of the British Empire in the Queen's birthday honours in 1962.

Sir FREDERICK WHITE

POSITIONS VACANT

The following vacancies for professional appointments are current:

EXPERIMENTAL OFFICER (E01/2) --- PHYSICAL CHEMIST ---Division of Chemical Engineering 608/59 (1.4.66). EXPERIMENTAL, OFFICER (E01/2) --- Division of Food Preserva-Division of Chemical Engineering 608/59 (14.69).
 EXPERIMENTAL OFFICER (EOI/2) — Division of Food Preservation 300/428 (54.66).
 RESEARCH SCIENTIST (RS) — RESEARCH FELLOWSHIP IN CLOUD PHYSICS — Division of Radiophysics 780/398 (6.5.66).
 RISERACH SCIENTIST (RS/SRS) — FELLOWSHIP IN SOLID STATE PHYSICS — Division of Tribophysics 370/176 (6.5.66).
 EXPERIMENTAL OFFICER (EOI/2) — Division of Protein Chemistry 462/255 (14.66).
 RESEARCH SCIENTIST (RS/SRS) — POSTDOCTORAL FELLOWSHIP IN PHYSICS — Division of Physics 770/312 (8.4.66).
 RESEARCH SCIENTIST (RS/SRS) — POSTDOCTORAL FELLOWSHIP IN PHYSICS — Division of Physics 770/312 (24.46).
 RESEARCH SCIENTIST (RS/SRS) — POSTDOCTORAL FELLOWSHIP IN COMBUSTION SCIENCE — Division of Chemical Engineering 608/60 (15.4.66).
 RESEARCH SCIENTIST (RS/SRS) — POSTDOCTORAL FELLOWSHIP IN COMBUSTION SCIENCE — Division of Calmesearch 480/511 (15.4.66).
 RESEARCH SCIENTIST (RS/SRS) — POSTDOCTORAL FELLOWSHIP IN NORGANIC INFRARED SPECTROSCOPY — Division Calmesearch 480/511 (15.4.66).
 RESEARCH SCIENTIST (RS/SRS) — POSTDOCTORAL FELLOWSHIP IN PLANT EIDCHEMISTRY MEDSTDOCTORAL FELLOWSHIP IN PLANT BIOCHEMISTRY — Horicultural Research 2016 (15.4.66).

When the Council was re-constituted as CSIRO in 1949, Sir Frederick was appointed a member of the Executive and Deputy Chairman. He became Chairman of CSIRO in 1959 following the death of Sir Ian Clunies Ross.



Above is an architect's impression of a proposed new laboratory for CSIRO at Indooroopilly, Brishane. The sketch was prepared from plans prepared by the Commonwealth Department of Works for presentation to the Parliamentary Works Committee last month. The laboratory, which is expected to be the major project on the Organization's programme of new works for 1966/67, will provide new accommodation for research teams from the Divisions of Animal Health and Entomology who are at present located at Yeerongpilly. It will also house smaller groups from the Divisions of Plant Industry and Entomology. The building will have a total floor area of more than 47,000 square feet and will consist of two double-storied wings, one for the Division of Entomology and one for the Division of Animal Health, connected by a single storey administrative block. In addition there will be a large basement area extending under both wings and the centre block. Total cost is expected to be about \$1,200,000 and it is hoped that building will begin in the first half of next year.

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in the organization of its radio-physics laboratory and the fol-lowing year he was appointed Chief of the Division of Radio-

WATCH ON THE SUN

When the Division of Physics completes the installation of its 12" solar telescope at Culgoora next June, Australia will have a major addition to its capability for high grade research in the field of optical astronomy.

For some years the Division has maintained a solar observatory at Fleurs, 30 miles west of Sydney; however, it was decided to establish a solar observatory at Culgoora, near Narrabri in north-west New South Wales, to secure improved weather and seeing conditions.

The optical observatory is being established on the same site as the radio heliograph of the Division of Radiophysics.

The 12-inch telescope is de-signed to photograph the fine structure of flares and other solar features.

If its performance comes up to expectations, it will be cap-able of seeing details as small as 250 miles in diameter on the surface of the Sun, which is some 93 million miles from the Forth some 93 the Earth.

The chief difficulty in observ-ing fine detail on the Sun arises from turbulent currents of heated air in the Earth's own atmosphere.

These image-spoiling cur-rents are worst near the ground; for this reason the telescope is being mounted on a stower some 50 feet high. a sturdy

The new telescope dispenses with the conventional dome, which itself can be a source of damaging thermal currents.

Instead, it is provided with a canopy which can be fully re-tracted into the supporting structure when the telescope is being used.

The telescope itself is of open lattice-work construction, so that it remains in full thermal equilibrium with the surrounding air.

As a final aid to thermal control, all parts of the tele-scope directly exposed to the Sun's rays are cooled by an elaborate air suction system.

The tower is unusual in that The tower is unusual in that it consists of two independent towers, one inside the other. The inner tower carries the telescope, while the outer tower carries all parts of the main structure that might be subject to vibration — such as the spiral staircase, the control room and the canopy.

In this way the telescope it-self is protected from vibra-tions that could cause blurring of the solar image. The inner and outer towers are mounted on completely independent con-crete foundations.

The telescope is unique in that it is the only one in the

world which is mounted wholly world which is mounted wholly -a opposed to partially -a a considerable height above the ground, which dispenses with the conventional dome, and which is subject to full thermal control. control.

In operation, the telescope In operation, the telescope is completely automatic; even the decision to take an ex-posure at a given instant is made by an electronic device that continuously monitors the image quality.

that continuously monitors the image quality. The design has been entirely carried out by CSIRO scien-tists and engineers. All con-struction, with the exception of the main 12-inch lens, has been the responsibility either of CSIRO's own workshops or of outside contractors in Sydney and Newcastle.

outside contractors in Sydney and Newcastle. In addition to the 12-inch telescope, the Division of Physics also has a 5-inch flare-patrol telescope which it has been operating at Culgoora since January last year. The instrument is being used for monitoring activity occur-

for monitoring activity occur-ring on the Sun, and formed part of Australia's contribution to the International Quiet Sun Year.

The project is being partly financed from funds supplied by the United States National Bureau of Standards.

Bureau of Standards. The 5-inch felescope was de-signed and constructed in the Division's laboratory in Syd-ney. It is automatic in opera-tion and is one of the most modern of its type in the world. world.

world. Photographs of the Sun are taken at half-minute intervals on 35 mm. film through a special optical filter, designed to isolate light coming from an outer region of the solar atmo-sphere, called the chromo-sphere, in which active phenomena such as flares occur. After being processed in After being processed in Sydney, the films are scanned at the Observatory, and solar activity reports are dispatched to World Data Centres in France, Russia, and the United States.

Left: In place of the conven-tional dome, the 12-inch tele-scope is provided with a fully

Below: The 50-foot tower on which the 12-inch telescope is mounted is actually two inde-pendent towers.



Above: Placing the 12-inch solar telescope in position on top of the inner tower.

Visits Overseas

Mr. J. D. Boyd of the Division of Forest Products left recently on a four month visit to Japan, North America, Europe, and Morocco. Mr. Boyd will be a member of the Australian dele-gation to the Sixth World Forestry Congress in Madrid next June. next June.

next June. Dr. A. T. Dick, Chief of the Division of Nutritional Bio-chemistry, left last month for the University of Missouri where he will spend six months on a National Science Founda-tion Senior Foreign Scientist Fellowship. Dr. Dick will also spend six weeks visiting re-search centres in Britain and Europe. Mr. C. B. Greeford Socre-

Europe. Mr. G. B. Gresford, Secre-tary, left last month for New York to attend the fifth session of the United Nations Advisory Committee on the Application of Science and Technology to Development. He will return solut this month

Dr. A. W. Rodwell of the Division of Animal Health leaves later this month for New York where he will present a paper at the Second Conference paper at the Second Conference on the Biology of Mycoplasma. After the conference, Dr. Rod-well will spend three months working on the biochemistry of mycoplasma membranes at the Hadassah Medical School, Leuveland Jerusalem.

Jerusalem. Mr. R. C. Woodham of the Horticultural Research Section left recently on a visit to over-seas vine research centres. Mr. Woodham will visit North America, Britain, France, Germany and New Zealand, and will spend five months at the University of California, Davis. He will return next October. October.

Dr. J. R. Yates of the Divi-sion of Protein Chemistry will leave next month to study over-seas developments in fellmon-gering and to convey the re-sults of Australian research to suits of Australian research to overseas fellmongeries. Dr. Yates will be away for ten months and will visit the United States, South America, New Zealand, South Africa, Britain, Europe, Russia, India, Japan and Hong Kong.

NUFFIELD GRANTS

Nuffield Special Study Grants have been awarded to Mr. W. W. Brandt of the Division of Entomology and Mr. H. Greenway of the Irrigation Re-search Laboratory at Griffith. Mr. Brandt who has built up Mr. Brandi who has built up an extensive collection of New Guinea Lepidoptera which is now part of the Australian National Insect Collection, will work primarily in the British and Tring Museums to com-plete the work of identification and classification of specimens.

When the classification of specimens. When the classification is completed, the collection, which is claimed to be the finest of Eastern New Guinea *Lepidop-tera* in the world, will provide an important source of refer-ence material for the Southern Hamionbara Hemisphere.

Mr. Greenway will leave next Mr. Greenway will leave next May to work in the Depart-ment of Agricultural Botany of the University of Nottingham on metabolic changes in vas-cular plants resulting from water shortage, and the causes of severe growth reductions even at moderate waterstress.



SAFETY NOTES

Is Your Resistance Low?

If you were an electrical plug, and had to spend your life in the corrosive atmosphere of a laborafory, your resistance would probably be very high. Just the opposite to what it should be.

Corroded pins on a plug cannot make good contact with the power outlet so the temperature in the socket rises. This causes loss of temper in the spring contacts of the outlet, and a worse contact results with higher temperature. If the plug and socket are made of plastic, the plastic deteriorates, resulting in loss of insulation and mechanical failure.

failure, Electrical contacts should be kept clean, preferably with steel wool or a mild abrasive. Coarse sand paper should not be used as it causes scratching, which gives electrical contact on the high spots only and scores the spring contacts in the power outlet. Particular care should be taken with the earth pin. A badly corroded earth connection can be as useless as none at all

at all



Development. He early this month.

News In Brief

Orbit Award

O'DIT AWARD CSIRO has won the Orbit Award for 1966 for two films produced by the Film Unit. The films are "Birth of a Kangaroo" (produced in colla-boration with the Division of Wildlife Research) and "Win-dow into Space: Parkes Radio Telescope" (produced in colla-boration with the Division of Radiophysics). Radiophysics).



The Orbit Award is presented annually for the best film sub-mitted to the A.N.Z.A.A.S. International Film Exhibition. This year, more than one hun-dred films from twelve countries were Exhibition. entered in the

Assistant Chief

Dr. R. A. Durie has been appointed Assistant Chief of the Division of Coal Research.

Institute President

Dr. E. M. Huiton of the Divi-sion of Tropical Pastures has been appointed Federal Presi-dent of the Australian Institute of Agricultural Science.

Ouick Ouiz

Quick QUIZ Did you know that CSIRO was the owner of subdivision 6 and subdivision 6A of resubdivision 2 of subdivision 2 of portion 252 and subdivision 2 of re-subdivision 3 of subdivision 2 of portion 21 Parish of Jeebro-pilly?

Bridge Club

Bridge Club Bridge players in the Sydney Divisions have formed a CSIRO (Sydney) Bridge Club. The Club, which will meet monthly, is open to CSIRO staff and their wives (or hus-bands). Further particulars may be obtained from Dr. N. S. Parker or Mr. T. J. Riley of the Division of Food Preserva-tion.

Doctorate

Mr. W. E. Hillis of the Divi-sion of Forest Products has been awarded the degree of Doctor of Science by the Uni-versity of Melbourne for his studies on the extractives of wood and other plant tissues.

Instrumentation Conference

Last February more than 180 physicists and biologists from sixteen CSIRO Divisions, and from Universities and State and Commonwealth Government Departments, attended a con-ference at the Division of Meteorological Physics on in-strumentation for plant environ-ment measurement. The aim of the conference

The aim of the conference was to bring instrument de-signers and field workers together to discuss require-ments and to learn something of the latest equipment and techniques available.

Topics discussed included vegetation structure and growth; radiation and heat ex-change; liquid water in the soil and plant; oxygen, carbon di-oxide, and water vapour; and data handling.

More than 40 papers were presented and some two dozen instruments were on display. Closed circuit television was used to cope with the large numbers of participants.



Last month a party of eight British science writers spent three weeks in Australia visiting scientific research centres. One of the highlights of their trip was a visit to the Division of Radiophysics' radio heliograph at Culgoora near Narrabri which is now nearing completion. This instrument, which consists of 96 saucer shaped aerials arranged in a circle two miles wide, will be used to obtain detailed radio pictures of the Sun. Our picture shows Dr. P. Wild of the Division of Radiophysics (second from right) discussing the operation of the radio heliograph with (from left to right) Mr. W. Payten (Radiophysics), Mr. Bryan Silcock (Sunday Times), Mr. Robin Clarke (Science Journal) and Dr. Peter Pockley (A.B.C.).

Screen News

Screen rvews The Food Preservation Film Society will screen "The Wrong Arm of the Law", the last British comedy starring Peter Sellers, and a documentary on juvenile delinquency "Children on Trial" at 7.30 p.m., Tuesday, April 12, in the Hicks Meeting Room North Ryde Room, North Ryde.

The Forest Products Film Society will screen the Hun-garian film "Be Good Until Death" at 8.00 p.m. on Wednes-day, 20th April, in the Divi-sion's theatrette, South Melbourne.

The 314 Film Society will screen the French film "The Die is Cast" at 8.00 p.m., Thursday, April 21, at Head Office.

Joint Venture

The Division of Plant Industry and the New South Wales De-partment of Agriculture are

collaborating in a venture to investigate some problems of the pastoral industry.

Five newly-appointed scien-tists from the Department of Agriculture will spend three years in the Division's Can-berra laboratories undertaking developmental and applied science projects in specific pastoral problems.

At the completion of the programme they will continue their research in the Depart-ment of Agriculture.

ment of Agriculture. The new appointees are: Mr. P. M. Dowling (aerial sow-ing of pastures); Mr. K. Helyar (factors limiting pasture yield); Mr. M. W. Hagon (physiology of pasture seeds); Mr. H. Fisher (agronomy of the higher rain-fall regions); Mr. A. C. Robin-son (factors influencing effici-ency of root nodule bacteria).

Below: Mr. Fisher at work in the glasshe



Above: Mr. Penny of the Computing Research Section addressing some of the conaddressing ference delegates



Last month, Mr. R. Muncey was farewelled by the Division of Building Research as he left to take up his new appoint-ment as Chief of the Division of Forest Products. He is shown here being congratulated by the Chief of the Division of Building Research, Mr. I. Langlands. Dr. W. Lippert will take over from Mr. Muncey as Head of the Division's Architectural Acoustics Section.

More Money Wanted Although the paid-up capital of the CSIRO Co-Operative Credit Society is now approach-ing the Si million mark, con-tinued investment in the Society is still needed to enable it to provide CSIRO staff with a source of low-interest finance. Last year the loan maximum was raised to \$6,000 and more funds are now required to help the Society meet the demand

More Money Wanted

funds are now required to help the Society meet the demand for these larger loans. Investment in the Society is open to all CSIRO staff and their relatives, and investors are offered a gilt-edged security of 6 per cent a year for periods of twelve months or longer. Money may be deposited for shorter terms, but in these cases the interest rate is 4 per cent. **Committee Member Committee Member**

The secretary, Mr. G. B. Gres-ford, has been appointed a member of the Executive Com-mittee of the Duke of Edin-burgh Conference on Human Aspects of Industrialization. Society President

Dr. J. S. Hosking of the Divi-sion of Building Research has been elected President of the Australian Clay Minerals

Society. Dinner Dance The Head Office Social Club is holding a dinner-dance at the "Dorchester" on Saturday, 14th May, commencing at 7.00 p.m. Tickets are available at only \$10.00 a double from Margaret Geraghty and Ann Goss (Head Office) and from Judy Roberts (Agricultural Liaison Unit).



Dr. B. Bubela has been ap-pointed to the Division of Plant Industry. He will work in the recently formed Baas Becking Biogeological Re-search Laboratory. After grad-uating Ag.Chem.Tech. from the Technical University of Prague, Dr. Bubela came to Australia in 1950 where he spent nine years with a pharmaceutical company. He graduated B.Sc. with honours from the University of Ade-laide in 1961 and Ph.D. from the same University in 1964. For the last two years he has been with the Worcester Foun-d at ion for Experimental Biology, Massachusetts.

Mr. R. W. R. Miller has been appointed to the Agricul-tural Liaison Unit at Head Office where he will be con-corned with the preparation of articles for "Rural Research" and with other liaison activi-ties. Since graduating B.A.



Mr. R. W. R. MILLER

from the University of Cam-bridge in 1930 and Dip.Ag.Sci. from the same University in 1931, Mr. Miller has held a number of different positions in Britain, India, Malaya, Sarawak and Australia. For the last four years he has been with the Information Branch of the Victorian Department of Aericollure. Agriculture.

Mr. M. Bussell, who grad-uated B.Sc. with honours last year from the University of Western Australia, has been appointed to the Division of Applied Mineralogy. He will work at the Secondary Indus-tries Laboratory, Perth, on the weathering of minerals. Mr. G. T. McKinney has joined the Division of Plant Industry and will study pasture utilization and the production and reproduction of livestock on improved pastures. Mr. McKinney graduated B.Rur.Sc. from the University of New England in 1964 and has been carrying out research at the University for the last two years. vears.



Mr. G. T. McKINNEY

Mr. I. L. Chapman has joined the Division of Physical Chemistry. He will investigate the relation between gas the relation between gas chromatographic behaviour and the physical and thermo-dynamic properties of volatile solids, stationary phase sol-vents, and their solutions After graduating B.Sc. from the University of Melbourne in 1963, Mr. Chapman spent eighteen months as a rethe

search assistant in the University's Biochemistry Department, Since then he has been a demonstrator at the Victorian College of Pharmacy. Mr. L. R. Crawford has been appointed to the Division of Chemical Physics where he will study the application of mass spectroscopy to fundamental problems in chemical physics. Mr. Crawford obtained his Diploma of Electronic Computation last year from Caulfield Technical College. Mr. A. W. Davis has joined

Mr. A. W. Davis has joined the Division of Mathematical Statistics where he will carry out research on statistical Statistics where he will carry out research on statistical theory. Mr. Davis graduated B.A. with honours from the University of Melbourne in 1956 and M.A. from the same University in 1960. From 1957 to 1960 he was a senior tutor in mathematics at the University of Melbourne and for the following two years a lecturer in mathematics. Since 1962 he has been a resident scholar in the Department of Statistics at the Australian National University. Mrs. C. A. Money has been

National University. Mrs. C. A. Money has been appointed to the Leather Re-search Section of the Division of Protein Chemistry. She will work on the effects of treating hides before processing in the tannery and on the quality of the finished leather. Mrs. Money graduated B.Sc. from the University of Melbourne in 1960 and M.Sc. from the same university in 1963. Since 1963 she has been carrying out en zyme research at St. Bartholomew's Hospital Medical School, London.



Mrs. C. A. MONEY

Mr. E. B. Dyrenfurth has Mr. E. B. Dyrenturth has been appointed to the Division of Animal Genetics and will carry out research on muta-genesis and antimutagenesis and base sequence studies in D.N.A. Mr. Dyrenfurth grad-uated B.Sc. from the University of Melbourne in 1963. He obtained his Dip.Ed. in 1964 and spent last year teach-ing in Victoria.

In a point has your teacher ing in Victoria.
 Mr. P. L. Eisler has joined the Division of Mineral Chemistry. He will investigate the use of gamma-ray spectro-scopy and associated tech-niques for identification of minerals. After graduating B.Sc. from the University of Melbourne in 1957, Mr. Eisler spent two years with the P.M.G. Research Laboratories before joining the Australian Atomic Energy Commission where he has worked on radia-tion detection and measure-ment.
 Mr. C. P. Pickup has joined

ment. Mr. C. P. Pickup has joined the Division of Physics where he will work on the develop-ment of specialised electronic equipment for solid state and low temperature research. Mr. Pickup graduated B.Sc. from the University of Sydney in 1949 and B.E. with honours from the same University in 1951. For the last fifteen years he has worked with Standard Telephones and Cables Pty. Ltd. Ltd.



Mr. M. C. Foster has been appointed to the Division of Organic Chemistry where he will work on the structure de-termination of plant alkaloids and other physiologically active substances. Mr. Foster graduated B.Sc. with honours last year from the University of Tasmania. Mr. J. E. Frisch, who grad-

of Tasmania. Mr. J. E. Frisch, who grad-uated B.Agr.Sc. with honours last year from the University of Queensland, has joined the Division of Animal Genetics. Mr. Frisch will work at Rock-hampton on the efficiency of feed utilization in cattle, par-ticularly digestion and energy metabolism. ticularly di-metabolism.

Miss J. M. Harris, who grad-uated B.Sc, with honours last year from the University of Sydney, has been appointed to the Horticultural Research Section. She will work at

SOURCE OF CONFUSION



When Mr. R. Mykytowycz of the Division of Wildlife Research left for overseas last month, he took with him 15 feet of airline tickets. Mr. Mykytowycz, who will spend six months visiting research institutions working on the behaviour of small mammals, will visit or pass through some 49 countries. Our picture shows Mrs. Del Chisholmi (left) and Miss Ellen Carroll of the Canberra Regional Administrative Office with the tickets.

Merbein on improving the processing of Australian dried grapes.

grapes. Dr. P. E. F. Kriedmann arrives shortly from the United States to join the Horticul-tural Research Section. Dr. Kriedmann will undertake re-search at Merbein on the physiology of fruit trees. Dr. Kriedmann graduated B.Agr.Sc. with honours from the University of Queensland in 1960 and Ph.D. from the University of Melbourne in 1963. Since 1964 he has been studying sugar uptake and translocation at Purdue University. Mrs. J. P. Loke has joined

at Purdue University. Mrs, J. P. Loke has joined the Wheat Research Unit where she will study the struc-ture and behaviour of lipo-proteins and glyco-proteins. Since graduating B.Sc. from the University of Sydney in 1963, Mrs. Loke has been a research assistant and demon-strator in the University's Biochemistry Department. Mr. C. F. Wallington has

Mr. C. E. Wallington has joined the Computing Research Section. He will work on

furthering the application and use of automatic computing processes. Mr. Wallington graduated B.Sc. from the Uni-versity of London in 1948 and M.Sc. from the same University in 1954. From 1947 until 1961 he worked with the British Meterological Office and for the last five years he has been Superintendent of the Meteoro-logical Research Division, Chemical Defence Experi-mental Establishment, England.



Mr. C. E. WALLINGTON

Mr. A. E. Newsome has been Mr. A. E. Newsome has been appointed to the Division of Wildlife Research to study the ecology of the dingo. Mr. New-some graduated B.Sc. from the University of Queensland in 1957 and M.Sc. from the Uni-versity of Adelaide in 1963. He joined the Animal Industry Branch of the Northern Terri-tory Administration in 1958 and Branch of the Northern Terri-tory Administration in 1958 and undertook a population survey of the red kangaroo. In 1963 he became a research fellow in the Zoology Department of the University of Adelaide where he has been studying for his Ph.D.

Ph.D. Dr. G. S. Sidhu has been ap-pointed to the Division of Food Preservation. Dr. Sidhu gradu-ated B.Sc. with honours from the Punjab Agricultural Uni-versity in 1949 and Ph.D. from the University of Melbourne in 1955. Since 1956 he has been at the Punjab Agricultural Uni-versity first as a research assistant and more recently as Professor of Biochemistry.

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SENATOR GORTON ON FUTURE **CSIRO** OF **Speech at Rivett Laboratory Opening**

"It is difficult to know what the future of an organisation like CSIRO is in a country expanding as rapidly as Australia," said the Minister-in-Charge of CSIRO (Senator Gorton) last month.

The Minister was speaking at the opening of the David Rivett Laboratory at Clayton, Victoria.

"Up to this point," said Senator Gorton, "CSIRO has been in a very real sense the equivalent of a National Science Foundation.

"The Executive has decided what programmes it wished to support and what fields it wished to encourage, and it has sought and allotted money to those, programmes and fields much in the way that a National Scientific Foundation would do would do.

"But CSIRO has grown so much, and is likely to grow so much more, that whether in the future it will divide amoeba-like or not is a ques-tion which I think must be in the minds of scientists.

"Let me take one example to "Let me take one example to show what I mean. Australia ranks among the first two or three countries in the world in the field of radiophysics and of radio-astronomy in particu-lar. lar.

"We also have the best con-ditions in the world for optical astronomy. People working together in the fields of radio astronomy and of optical astronomy might hive off from CSIRO and other bodies and become a unit in their own right.

right, "Such units could, if you had a National Science Founda-tion, make applications to it. I do not foresee that CSIRO will cease to be a highly im-portant, highly significant facet in the scientific life of Aus-tralia. tralia.

"But the question occurs to me—Will it go on in the future as the same sort of organization it has been in the past with one central Execu-tive?

"Or will CSIRO laboratories look to some new scientific foundation? These questions are under active consideration.

- C 607 (055.3) CO S((OR)

"But if we set up some over-all science committee to allocate funds throughout Ausanocate funds throughout Aus-tralia for scientific research, to CSIRO, to the Atomic Energy Commission, to the universi-ties, how should it be set up and how should it work?

and how should it work? "All of you in the scientific community have got a very real interest in putting your individual minds to work on this, so that when it comes more closely into the field of public discussion you'll have your own views crystallized and be able to discuss them with your colleagues and dis-cuss them publicly, because this must be at some stage another step forward in Aus-tralia's scientific development." Senator Gorton also referred

Senator Gorton also referred to the siting of the David Rivett Laboratory alongside Monash University.

Monash University. It was a good idea, he said, to have CSIRO laboratories built close to universities. "For one thing," he said, "the people working in these sorts of scientific complexes are very practical people and it is good for the university people to have a chance to meet them, and for the general exchange of ideas in an academic community. "I would hone that wa'd he

academic community. "I would hope that we'd be able to make that exchange even better, since the question of transferability of scientists and others from university to CSIRO, taking with them their superannuation entitlements, has passed from being under consideration to being under active consideration. "We are new moving along

"We are now moving along that road. I regard this as significant both to universities and to CSIRO and, if it can be worked out, to industry."

The Minister was welcomed by the Chairman of CSIRO, Sir Frederick White.

Sir Frederick paid tribute to the late Sir David Rivett, the first Chief Executive Officer of C.S.I.R., who died five years ago.

"Sir David was a chemist himself," said Sir Frederick. "This particular laboratory is one of a group of chemical laboratories in CSIRO, one in fact that he would be very proud of proud of.

proud of. "It professes the sort of chemistry that is now in the forefront of modern develop-ments in chemical analysis and chemical theory. So we have named the laboratory after David Rivett because of his association with us and be-cause of his eminence as a chemist. chemist.

"It was David Rivett's hope right from the beginning that the laboratories of CSIRO would be closely associated with the Australian universi-ties, and he actually brought about the erection of labora-tories on university campuses."

Dr. A. L. G. Rees, Chief of the Division of Chemical Physics, thanked Senator Gorton for performing the opening

He said that a new building for Chemical Physics had first been proposed in 1945, in Sir David Rivett's time. He was rather glad, in retro-spect, that nothing had been done at that time. The present magnificent building was by way of being a 21st birthday present

way of present. Dr. Rees presented the Minister with an ashtray and a letter opener for Mrs. Gorton, both made from a letter opener Gorton, both m diffraction gratings.

The opening ceremony was attended by Sir David's widow, Lady Rivett, and his sons Mr. Rohan Rivett and Dr. Kenneth Rivett.

Also present were a former Minister-in-Charge of CSIRO, Dr. D. A. Cameron, and former Members of the Exe-cutive, Sir Arthur Coles and Dr. I. W. Wark.

The David Rivett Labora-tory is situated on a 38-acre site in Bayview Road, Clayton, close to Monash University. It tories to monash University. It is the first unit of the CSIRO Chemical Research Labora-tories to move from Fisher-men's Bend to Clayton. It is planned that the others will follow later.

Tollow later. The new building incor-porates a number of special features dictated by the scien-tific research conducted in it. Notably, the laboratory is totally air-conditioned and dust-free with a zoned system allowing maximum adapta-bility to the specific require-ments of its various sections.

ments of its various sections. A bronze likeness of Sir David Rivett hangs promi-nently in the foyer of the Laboratory. The work of a leading Melbourne sculptor, Andor Meszaros, the plaque represents man rising above superstition a n d ignorance, and forms a prototype for the David Rivett Medal. This medal is awarded

This medal is awarded annually by the CSIRO Officers' Association for out-standing achievement by a CSIRO scientist.

The Division of Chemical Physics started in 1944. Dr. Ian Wark, then Head of the

Above: A bronze plaque bear-ing a likeness of Sir David Rivett hangs in the foyer of the new laboratory. Admiring the plaque are, from left to right, Dr. A. Walsh (Assistant Chief of the Division of Chemical Physics), Professor R. Street (Professor of Physics, Monash University), and Dr. A. L. G. Rees (Chief of the Division of Chemical Physics).

CSIR Division of Industrial Chemistry at Fishermen's Bend, encouraged by Sir David Rivett, invited Dr. A. L. G. Rees to form a Chemical Physics Section,

The Section pioneered for Australia a number of new physical techniques used in chemical studies; for example, it introduced the first electron microscope into Australia in 1945 1945.

1945. Today, Dr. A. L. G. Rees, as Chief of the Division of Chemical Physics, looks back on 21 years of achievement by the Division. In that time guest scientists have come from many parts of the world to work in the Division and its reputation is firmly estab-lished as a leading centre for the application to chemistry of the methods of physics.

On a spect of the work of the Division has been the pro-motion of a scientific instru-ment industry in Australia. A number of original scientific instruments and techniques have been developed in it and some have been developed some have been developed commercially with great suc-



POSITIONS VACANT

The following vacancies for professional appointments are

- CHITERI: EXPERIMENTAL OFFICER (E01/2) -- ORGANIC CHEMIST --Division of Entomology 180/356 (13/5/66). EXPERIMENTAL OFFICER (E01/2) -- DOD IRRADIATION --Division of Food Preservation 300/416 (13/5/66). SCIENTIFIC SERVICES OFFICER (SSO1/2/3) -- Computing Re-search Section 900/50 (13/5/66). RESEARCH SCIENTIST (R8/SRS) -- 2 positions -- Division of Entomology 180/328 (13/5/66). RESEARCH SCIENTIST (R8/SRS) -- 2 positions -- Division of RESEARCH SCIENTIST (R8/SRS) -- Wheat Research Unit 651/24 (13/5/66). SCIENTIFIC SERVICES OFFICED (SEO1/2/2).

- RESEARCH SCIENTISI (KS)GKS) When Keenen Out Only (13/5/6). SCIENTIFIC SERVICES OFFICER (SSO1/2/3) EDUCATIONAL OFFICER Computing Research Section 900/51 (20/5/66). RESEARCH SCIENTIST (KS/SRS/RS)) a positions Riverina Laboratory, Division of FIST (KS/SRC) PHYSICAL OCEANO (RAPHIER Division of Fisheries and Oceanography 320/343 (6/6/66). EXPERIMENTAL OFFICER (E0/1/2) MEYSICAL EN-GINEER Division of Food Preservation 300/429 (15/6/66).

PROBLEMS AND OPPORTUNITIES OF SCIENCE JOURNALISM

One can write about science for people willing to read and study the article (like the readers of "Scientific American" or "New Scientist") or for people who only want to be entertained. Some organs of our daily press have a serious readership, but I think we should concentrate our discussion on the "average" daily press, because it has by far the greatest readership and poses by far the most difficult problem — to put over some idea of how science works and what it means to that ninety-five per cent. of the people who don't want to study anything.

There are still scientists who take the attitude that getting on with their work in the lab. is all that matters; it is of no moment whether anyone else understands what they are doing.

what they are doing. In some, this is the residue of an ivory-tower attitude which became out of date twenty years ago,

In others, this reticence has been induced by unfortunate experiences with the press. You will all know of examples of misreporting of science.

The journalists here tonight, but not all the scientists, will be aware of how difficult a scientist can make accurate reporting by his refusal or his inability to explain his work in simple terms.

The scientists present will be more acutely aware than the journalists of their feeling of embarrassment when emphasis has been wrongly placed or when reservations they have made are left out. They mainly feel embarrassed because of what their scientific peers may think.

I believe both they and their peers can be wrong in this. They have to learn not to apply to press articles the same critical standards (hey apply to a scientific paper.

There are real critical standards for press articles, but they are different ones.

There are other scientists who are well aware of the importance of a general understanding of their work; who believe it is their responsibility to reveal what they are doing.

I think a thing which is helping to spread this attitude is the growth of the practice of funding science at a project level by committees, so that telling people what one is doing becomes part of the yearly round.

By Dr. J. E. Falk

On the last night of the recent visit to Australia of a group of British science writers, a symposium on science and the press was held at the Australian Academy of Science building in Canberra. The two principal speakers were Mr. Nigel Calker, editor of "New Scientist", and Dr. John Falk, Chief of the Division of Plant Industry. This article is a synopsis of Dr. Falk's address.

While aware of the desirability of being reported, I think that most of us make judgements, often instinctively, of the newsworthiness of our work. Unless the work has clear applications to human affairs, I think we usually decide that it is not news.

Why should it interest the public anyway; if we make it simple enough for them to understand people won't appreciate how hard it is; how can we possibly explain it when they don't know the language? Take, for example, Woodward's total synthesis of chlorophyll a year or so ago. This was a piece of organic chemical work which to an organic chemist was quite moving for its elegance, and it quite rightly clinched Woodward's Nobel Prize.

It rests on a background of intense work by hundreds of chemists, or perhaps a couple of thousand research papers in the field of pyrrole pigment chemistry alone.

A background literature in just this one region of chemistry is comparable in quantity to the whole of the extant classical Latin literature.

And of course Woodward and his co-workers used further background from many other branches of chemistry, as well as a great deal of imagination and ingenuity.

And all this in the language of organic chemistry which, as M. W. Thistle has pointed out, has about twice the vocabulary of the English language.

Of this language the public hardly knows one word.

What picture could possibly be given in the daily press of the elegance of Woodward's achievement, of the scholarship behind it?

Some clever journalists have made the synthesis of chlorophyll more newsworthy by stories about how it has brought closer the day when man might be able to do without green plants, and make carbohydrates in chemical factories.

I think this is an unwise reaction; I believe we scientists will have to take the rough with the smooth, doing what we can to help the situation to improve, hoping that our newspapers will make a real effort in this direction themselves.

The Australian Scene

There is really excellent science journalism in some of our country press, though most of it appears to be the work of outside writers, such as officers of the Department of Agriculture, or University staff.

But the country press stands in a quite different relationship to its readers to the daily city press. Its readers really want to learn and to know about agricultural science and technology.

We have a few intellectual weeklies, again with readers presumably wanting to learn, but there is little evidence of a real interest in any of them in science and technology in general.

Then we have our daily press. Of our many large city newspapers, only two or three have permanent science correspondents on staff, and this has only happened in the past year or two. No daily newspaper to my knowledge yet has a science editor, though all have sporting editors and most have financial editors.

I think journalists themselves could take a more active interest in the problem. In "The Journalists' Craft", written by a representative body of professional Australian journals, the only use of the journalists' words science, technology and research that 1 could find in the index was in the phrase "Christian Science Monitor". Is this a measure of the interest of Australian journalists in science reporting? I hope that skilled and experienced science journalists will be encouraged to develop in Australia.

I think that the real challenge to their skill and ingenuity, here as in any country, is to manage to mix in with the entertainment which catches the interest of the reader, just a little information about the slow hard road, the intense study, the tenacity, the heartbreaks of experimental science.

If the public just begin to understand how human it all is, they will start to lose their fear and their distrust of science.

They are going to have to live with it forever, so the sooner it can be made a little more comfortable for them the better.

More serious than this, the public elects some of its members to be the politicians who govern.

Those who govern and those who elect them should understand how science works, and know something of what it is doing, because virtually every aspect of human affairs is now influenced by science in the broadest sense.

The social responsibility of scientists has become a kind of catch-cry. But it is not scientists who decide how their discoveries will be used, but the people, through their elected representatives.

How can they make wise decisions without learning enough about science to understand what is explained to them — and where are they likely to learn except from their daily newspapers?

This is the responsibility and the challenge to scientist, science journalist and newspaper alike.

Overseas Visits

Dr. C. A. Anderson of the Division of Textile Industry left recently for England where he will spend five months working at the Unilover Research Laboratories on detergency of fatty soils from textiles. Dr. Anderson will also spend a month visiting textile mills in Europe and Japan to advise on wool scouring and lanolin recovery before returning to Australia early in November.

Mr. J. Czulak of the Division of Dairy Research left last month on a six week visit of cheese manufacturing plants and research centres in North America, London, Germany, France and Holland.

Dr. B. Dawson of the Division of Chemical Physics leaves later this month for Britain. Dr. Dawson will spend six months at the Atomic Energy Research Establishment at Harwell taking part in a programme of high temperature neutron diffraction studies.

Mr. P. H. Frost of the Computing Research Section left recently for North America and Britain where he will visit computing research centres and attend a number of conferences. He will return at the end of next month.

Mr. N. H. Kloot of the Division of Forest Products left recently on a three month visit to timber research centres in South Africa, Britain, France, North America and New Zealand.

Mr. G. Loftus Hills, Chief of the Division of Dairy Research, will leave shortly on a three month visit of dairy research centres in Britain, Europe, North America, and Japan.

Mr. L. L. Muller of the Division of Dairy Research will leave shortly on a three month visit of America, South-East Asia, Britain and Europe for discussions on casein chemistry and other aspects of dairy chemistry.

Mr. A. E. Scott, Editor-in-Chief of the Editorial and Publishing Section, left recently for Hong Kong, Thailand, Britain, Europe, and America for discussions on the publication of scientific literature.

Dr. D. L. Serventy of the Division of Wildlife Research left last month for Britain, Spain, Russia, and America where he will visit ornithological research centres. Dr. Serventy will return to Australia next September.

Mr. W. H. Southcott of the Division of Animal Physiology leaves shortly on a three month visit to the United States, Africa, Finland, and Britain where he will study current research on the ecology of parasites and pastures.

of parasites and pastures. Dr. G. F. Walker of the Division of Applied Mineralogy will leave later this month for overseas where he will attend the International Clay Conference in Israel and visit research centres concerned with clay minerals in America, Britain, Europe, and South Africa. Dr. Walker will return at the end of July. If by this kind of parable it is possible to teach a few million more people one of the facts of life—our total dependence on green plants and at the same time to give them just a glimpse of the kind of thing that happens in a chemical research laboratory, is there anything wrong about it? Perhaps scientists are often too squeamish about this kind of thing.

But now what happens! A responsible journalist hands in an honest story of this kind, and it comes to the desk of a sub-editor totally ignorant of scientific perspectives, totally ignorant of the background that the journalist who wrote the story has gleaned from reading or interviews, concerned only with the entertainment value, the newsworthiness, of the story.

What does he do? He chops off the last paragraph which points out that a lot more biochemical understanding has to be obtained, that artificial photosynthesis in factories is still a long way off, and he gives the article a title something like "Grass Obsolete — Chemists Can Do It".

It is thus quite natural that the public gets the impression that science moves forward by a series of breakthroughs on a number of fronts at a time, and never gets any idea of the kind of work and thought behind most innovations. And it is not too hard to understand the scientist who reacts to such a report with: "that's the last time I'll have anything to do with newspapers".



and the press.

News In Brief

Gold Medal

Mr. A. M. Thompson of the Division of Applied Physics Division of Applied Physics has been named joint re-cipient of the Albert F. Sperry Award by the Instru-ment Society of America. The award, which carries a \$1,000 honorarium and a gold medal, was shared with **Dr. D. G.** Lampard, formerly of the Division and now Professor of Electrical Engineering at Monash University. The award is in recognition

The award is in recognition of their work on the develop-ment of methods for the pre-cise measure of electrical capacitance and the absolute determination of the ohm.

University Post Mr. L. W. Weickhardt, Chair-man of the Victorian State Committee and a member of



Mr. L. W. WEICKHARDT

the Advisory Council has been appointed Deputy Chancellor of the University of Melbourne.

Directors

Mr J. G. Bolton of the Divi-sion of Radiophysics has been designated Director of the Australian National Radio Astronomy Observatory at Parkes.

Dr. J. P. Wild of the Divi-sion of Radiophysics has been designated Director of the Solar Radio Astronomy Observatory at Culgoora.

Honour

Mr. H. A. the Division A. Stephens of Mr. H. A. Stephens of the Division of Applied Mineralogy, has been elected a Fellow of the Institute of British Foundrymen. He is only the second Australian to be made a Fellow. Mr. Stephens has also been elected National President of the Aus-tralica Association of Foundry. tralian Association of Foundry Institutes.

A.D.P. in

Administration

Administration An extensive analysis of CSIRO administrative systems is to be undertaken to de-termine the feasibility of using automatic data processing over a wide range of operations. Mr. I. Dunlop, formerly Divisional Administrative Of-ficer at the Division of Build-ing Research, has been ap-pointed to the staff of Head Office to do this. He is at present taking a three months course in system analysis given by the Public Service Board Training Group.

Officers' Association

The Annual General Meeting of the Victorian Branch of the CSIRO Officers' Associa-tion will be held at the Divi-sion of Forest Products on Monday, 23rd May at 7.45 p.m.

The guest speaker will be Dr. D. M. Myers, Vice-Chancellor of the Latrobe Dr University.

Screen News

Screen News The Food Preservation Film Society will screen the Rus-sian production of Shake-speare's comedy "Twelfth Night" together with the Australian silent classic "The Sentimental Bloke" on Tues-day, May 10th, at 7.30 p.m. at North Ryde. The Forest Products Film Society will screen the Indian film "Devi" at 8.00 p.m. on Thursday, May 12, in the Divi-sion's theatrette, South Mel-bourne.

bourne.

The 314 Film Society will also screen "Devi" at 8.00 p.m., Thursday, May 19, at Head Office. "Devi" is directed by Satyajit Ray and stars Shar-mila Tagore and Soumitra Chatterjee.

Wasted Talent

Wasted Latent Two pigeons trained as pill inspectors by a leading U.S. pharmaceutical firm developed better than 99 per cent ac-curacy in detecting imperfect capsules as they came off the drug maker's production line. The giscense did not come in The pigeons did not come in actual contact with the capsules and viewed them only through a small window while stationed in a sealed-off compartment.

Yet, the drug company de-cided against using the birds, apparently out of fear that the public might think the pills were contaminated and because there might be out-cries of cruelty to animals.



Pictured above is the entrance to the Regional Administrative Office, Brisbane, on the seventh floor of the Hibernian Building, 246-248 Queen Street, Brisbane. The office at present is handling some staff matters and salary payments to CSIRO staff in Queensland, and the office will be gradually developed to provide the full range of support activities provided by the other Regional Administrative Offices. Staff travelling through Brisbane may make use of the telephone, teleprinter, copying and correspondence facilities. A small conference room is available for use by Divisions requiring a central meeting place. The telephone number of the Regional Administrative Office is 31 2324.

NATIONAL DROUGHT FODDER PLAN

Proposals for a national drought fodder scheme, based on the use of wheat, for feeding sheep through the crisis period, were made recently by Dr F. H. W. Morley and Mr. M. A. Ward of the Division of Plant Industry.

Writing in the latest issue of the Journal of the Australian Institute of Agricultural Science, they say that hand-feeding of wheat in drought periods has been shown to be the most economical strategy for graziers in many situations, provided wheat is readily available.

By adopting this strategy substantial amounts of capital could be released, which would otherwise be tied up in fodder conservation and which could be more profitably used on pasture improvement, increased tooking rotes on other forms stocking rates or other forms of investment.

of investment. Some of the fear of drought, which is at present limiting full use of improved pastures, could be removed by the guaranteed provision of wheat at pre-determined prices. Dr. Morley and Mr Ward say that, while short-term fod-der reserves are probably best provided by the farmer, either by conservation on the farm or by purchase when supplies are plentiful and relatively cheap, conserved fodder is un-likely to be the most economi-cal means of ensuring against cal means of ensuring against a drought.

a drought. Wheat will usually be the cheapest food source during drought in terms of landed and fed price per food unit, because the price has been stabilised at about \$1.50 a bushel, whereas the price for most fodder rises in drought. Losses incurred in letting a sheep die in drought would total \$13.10. Feeding wheat to keep sheep

total \$13.10. Feeding wheat to keep sheep alive would be economic if the total feed costs came to less than \$13 a head. This would be equivalent to 65 weeks hand feeding at 20 cents a week. It costs 15 cents a head a week to feed wethers on wheat and 22 cents a week for ewes. Dr. Morley and Mr. Ward claim that it would be economi-cal for the nation to provide a national fodder reserve.

If a guaranteed supply were available at a guaranteed price, hand-feeding, which in many cases becomes uneconomic, would become an economic

would become an economic drought strategy for the in-dividual in many situations, particularly with wheat. Although wheat has been made available for stock feed-ing in the past, there have because of the lack of the high degree of planning and co-ordination required to have

wheat available in the right place at the right time.

Drought effects, although often restricted to particular areas, may be extended economically to larger regions, influencing the price and the availability of both fodder and limetock livestock.

Hence the authority controlling a wheat fodder scheme should deal with the whole of Australia, or at least with large regions.





The United States Consul General for Victoria, Mr. W. S. Wieland, visited the Division of Textile Industry at Geelong last month. He is shown here with Mrs Wieland watching a washing test being carried out by Robyn Larkin on shrinkproofed wool samples.

Mr. A. R. Anderson has joined the staff of the Division of Applied Physics where he will work on frequency and im-pedance standards. Since



Mr. A. R. ANDERSON

graduating from Sydney University in 1963 he has been teaching science at Campbell-town High School.

Dr. M. B. Clowes has been appointed to the staff of the Computing Research Section. After graduating Ph.D. from the University of Reading in 1959, he worked for four years



Dr. M. B. CLOWES

National Physical the Laboratory on character recog-nition systems. Since 1963, Dr. Clowes has been on the staff

SAFETY NOTES

The Naked Flame

A fire occurred in one of our laboratories recently. Although the damage was not great, the consequences could have been serious.

The cause of the fire was carelessness.

Apparently a gas burner had been left on by a staff member at the end of the day and this had ignited the in-sulator of some nearby electric cables.

cables. The fire was noticed by staff still in the building and was held in check with hand fire extinguishers until the auto-matic sprinkler system came into operation and extin-guished the blaze.

A fire like this could just as easily have started in a labora-tory without sprinkler protection.

However, it might not have been noticed, or it might not have started until everyone had left for the night — either way the results could have been dimetered. disastrous.

Gas burners should never be left on in unattended labora-tories. If not being used they should either be turned off or the air supply cut off to give a visible flame.

If you have been using gas, make sure it is off when you have finished with it. Do not place burners where the flame can ignite equipment or bench fittings.

And remember, always check your laboratory before leaving.

J. W. Hallam, Safety Officer.

of the Psycholinguistics Re-search Unit at Oxford. He has also been a consultant to St. Dunstan's on sensory aids re-search. search.

Mr. S. A. Bailey, who grad-uated in science last year from the University of Sydney, has joined the staff of the Division of Coal Research where he will work on the application of mass spectrometry to the eluci-dation of chemical structure.

Mr. R. A. Leppik, a grad-uate of the University of Syd-ney, has joined the staff of the Division of Plant Industry. He will investigate the extraction of biologically active sub-stances from tobacco plants. Mr. Leppik was previously on the staff of the Prince Henry Hospital in Sydney.

Lesley MacCormac, Miss who recently graduated from the university of Adelaide, has been appointed to the staff of the Division of Soils. She will



be responsible for some X-ray spectrographic analyses, in-cluding the development of techniques.

Mrs. L. I. Paton has com-menced part-time work with the Division of Plant Industry. She is a graduate of the Uni-versity of Tasmania and was for three years a research assistant in the University's B ot a ny Department. Mrs. Paton is now married to a member of the staff of the A.N.U. Botany Department.

Mr. D. W. T. Piercy is at present en route from the United Kingdom to Mel-bourne where he will join the staff of the Division of Animal Health. Since qualifying M.R.C.V.S. from London a

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year ago, he has been in private practice as a veterinary surgeon in Norfolk.

Mr. F. C. O. Sticher, a grad-uate of Sydney University, has joined the staff of the Division of Food Preservation. He will nake a study, sponsored by the Australian Meat Board, of possible ways of developing equipment for the mechanical skinning of sheep.

Mr. C. P. Meakin has been appointed to the staff of the Division of Coal Research where he will take part in re-search on the chemistry of



Mr. C. P. MEAKIN

coal-based chemicals. He redegree at the University of Adelaide.

Dr. K. R. Rao has taken up a research fellowship in the Division of Building Research where he will study the effect of buildings on the indoor en-vironment. A graduate of



Andhra and Roorkee Universities, he has been on the staff of the Central Building Re-search Institute in India since

1949.

Mr. F. R. Townsend has been appointed to the staff of the

SWIMMING SPORT



The CSIRO Melbourne Divisions held their Annual Swim-ming Sports on 23rd March at the City Baths, Melbourne, Teams competed from Forest Products, Protein Chemistry, Mechanical Engineering, Building Research, Chemial Re-search Laboratories, Animal Health and Head Office. Events included the plunge, an egg and spoon race, an obstacle race, and a cork scramble. The most exciting event of the evening was the medley relay which was closely won by Protein Chemistry. Annette Neville from Animal Health won the ladies' breaststroke and the freestyle, while Hugh Farrimond from Mechanical Engineering won the men's freestyle. The diving judge was Dave Norris, a former Australian Olympic representative. He said there were no future champions at the sports. The trophy, held for the last year by Mechanical Engineer-ing, was won by Forest Products, with Protein Chemistry the sumer-up. The prize is a trophy which unfortunately, has been missing for the past two years! Our picture shows Protein Chemistry champion Willem Lamkhorst with judge Danielle Le Grand, also of Protein Chemistry.

Chemistry.

Division of Dairy Research. After gaining his diploma at the Royal Melbourne Institute of Technology in 1952 he joined the firm of W. S. Kimpton & Sons as research chemist. Since 1962 he has been Chief Chemist at Brock-hoffs Biscuits Pty. Ltd.

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graduate of London University, he has been for the last five years at the Microwave Physics Laboratories of the General Electric Co. in London.

Mr. T. K. Smith has been appointed to the staff of the Division of Organic Chemistry and will join the group work-ing on alkaloids. Mr. Smith has been on the staff of the



Mr. T. K. SMITH

Defence Standards Labora-tories for the past five years. He gained a Diploma of Ap-plied Chemistry in 1964.

Dr. Rifa Wensler, a Canadian citizen, has joined the staff of the Division of Entomology. She is a graduate of the Uni-versities of Saskatchewan, Manitoba, and Cambridge. For the past year she has been at the Institut für Pflanzenkrank-heiten at Bonn, Germany. At Canberra Dr. Wensler will carry out studies of the be-havioural physiology of pasture havioural physiology of pasture insects

Printed by CSIRO, Melbourne

"Still too big, Perring, too big!"

ALE.

Mr. J. K. Walter has joined the staff of the Division of Applied Physics where he will assist with the development of improved methods of measur-

086-1966



NEW PROCESS MAKES WOOL SHRINKPROOF

A revolutionary new process for the shrinkproofing of wool was announced last April at a symposium on shrinkproofing at the Division of Textile Industry, Geelong.

The process, which marks a major step forward in the pro-duction of machine-washable textiles, is the culmination of 18 years of research into the shrinkproofing of wool by the Division Division.

During this period several shrinkproofing processes were developed which proved satis-factory for hand washing or mild machine washing.

However, the new process is greatly superior to these earlier methods and will enable wool to withstand any condition of machine washing likely to be met in practical use.

The shrinkproof process, which is a continuous one, has the advantage of being applied at the "top" stage, a term which describes the combed form of a mass of fibres prior to existing to spinning.

The wool is treated with an The wool is treated with an extremely weak solution of chlorine which is subsequently neutralised. It then passes into a weak solution of synthetic resin before being dried on standard equipment and spun in the normal way.

Fabric knitted from treated yarn and subjected to the

severe test of four hours of washing has usually shown a shrinkage of less than one percent.

The new process has a num-ber of advantages. Unlike most previous treatments, it causes no deterioration of fibre strength.

The chemicals used are not expensive and are readily avail-able. Because they are applied solely in water-based solutions expensive solvents are not required.

The resin is cured in the drying temperature range normally used in the wool tex-tile industry and therefore no fibre damage or discolouration takes place.

Finally, the type of equip-ment required is already in use in some textile mills and adaptation should not be difficult

Nevertheless, it would take industry some time to modify its processes to incorporate the new treatment on a large scale, For this reason it is not ex-

be that gaments treated by the new process will be avail-able to the consumer until next year.



Advisory Council Meets In Sydney

The Advisory Council held its 33rd meeting at Menzies Hotel, Sydney, on the 10th and 11th May. A good deal of the meeting was devoted to the work of the Sydney divisions.

On the first morning, Dr. E. G. Bowen, Chief of the Division of Radiophysics, spoke on recent developments in cloud seeding in Australia and overseas and of the prospects for conducting practical rainmaking operations in this country. An account of his talk is given on the next page.

Following Dr. Bowen's address the Council split into two groups, one of which visited the Division of Textile Physics at Ryde, while the other visited the Ian Clunies Ross Animal



Dr. S. D. Hamann, Chief of the Dr. S. D. Hamann, Chief of the Division of Physical Chemistry, was elected a Fellow of the Australian Academy of Science last April, for his "contribu-tions to the effect of high pres-sure on chemical reactions and to the theory of intermolecular forces in fluids."



Dr. S. D. HAMANN

The Governor-General, Lord Casey, was also elected a Fellow of the Academy for "conspicu-ous service to the cause of science." Lord Casey is a former Minister-in-Charge of CSIRO and a former Executive Member.

Research Laboratory of the Division of Animal Physiology at Prospect.

In the evening the Advisory Council attended an informal dinner at Meazies. The guests included a number of pro-fessors from Sydney's three universities fessors fro universities.

universities. The following morning, after a number of brief items, Dr. A. Walsh, Chief of the Divi-sion of Chemical Physics, traced the history of atomic absorption spectroscopy in Australia and spoke of some of the problems which had been encountered in develop-ing it commercially.

The rest of the morning was taken up with a discussion on the Organization's estimates for 1966-67.

After lunch Dr. G. F. Humphrey, Chief of the Divi-sion of Fisheries and Ocean-ography, spoke on ocean-ographical research in Australia.

He said that although Ausrie stid that although Aus-tralia had only been carrying out research in this field for the last ten years, she was now among the first six occan-ographic countries in the world.

Dr. Humphrey was followed by Mr. V. D. Burgmann, Chief of the Division of Textile Physics, who described the work of his Division and spoke about research on wool measurement.

Our picture above shows Mr. P. J. Reis of the Division of Animal Physiology explaining to members of the Advisory Council visiting Prospect, how wool growth is measured. With him is Miss Susan Munro.

OBITUARY

Mr. Platon Kazakov of the Translation Section, Sydney, died suddenly on 21st April. Mr. Kazakov was born in Russia in 1896. After serving in World War I he spent some time in Manchuria where he graduated in law.

After a period as lecturer in Russian at various Chinese universities in Peking, he came to Australia in 1956 and two years later joined the Transla-tion Section.

A mature and dedicated translator, helpful and thought-ful in all that he did, Mr. Kazakov established himself as a trusted auxiliary to many CSIRO research teams in Syd-ney. ney.

In his special fields of radio astronomy and solar physics, the volume of his work and its value to the research effort would be hard to calculate.

Mr. Kazakov was a gentle, kindly man and will long be remembered with appreciation and affection by those who knew and worked with him.

POSITIONS VACANT

The following vacancies for professional appointments are current:

- EXPERIMENTAL OFFICER (E02/3) VETERINARY OFFICER Division of Animal Health 202/279 (10/6/66). EXPERIMENTAL OFFICER (E01/2) Division of Chemicai Physics 582/12 (10/6/66). EXPERIMENTAL OFFICER (E02/3) Division of Mineral Chem-
- *EXPERIMENTAL OFFICER (E02/3) Division of Mineral Chem-istry 601/44 (10/6/66). CHEMIST OR JANGER (10/6/66). RESEARCH SCIENTIST (RS/SRS) PHYSICIST OR PHYSICAL CHEMIST Division of Forest Products 20/0715 (1/1/66). RESEARCH SCIENTIST (RS/SRS) RESEARCH IN ATMO-SPHERIC RADIATION Division of Meteorological Physics 420/215 (8/7/66). RESEARCH SCIENTIST (RS/SRS) RESEARCH PHYSICIST OR CHEMIST Division of Forest Products 290/775 (11/7/66). RESEARCH SCIENTIST (RS/SRS) RESEARCH CHEMIST Division of Textile Industry 464/387 (11/7/66). RESEARCH SCIENTIST (RS/SRS) INBERARCH CHEMIST Division of Animal Health 202/281 (15/7/66). RESEARCH SCIENTIST (RS/SRS) GEOMORPHOLOGIST Division of Land Research 618/192 (29/7/66).



Dr. A. E. Pierce, Ph.D., D.Sc., F.R.C.V.S., has been appointed Chief of the Division of Animal Health following the retirement of Dr. T. S. Gregory. He will take up his appointment in August.

in August. After obtaining his Diploma of Veterinary State Medicine from the Royal Veterinary College, Dr. Pierce joined the British Ministry of Agriculture in 1943 and worked on trichomoniasis of cattle at the Ministry's laboratory at Weybridge and at the University of Wisconsin where he obtained his M.Sc, in 1948. In 1950 he was appointed to the staff of the Lister Institute as an Agricultural Research Council Fellow and since 1952 has held various research posts at the A.R.C. Institute of Animal Physiology at Babraham, Cam-bridge.

A.K.C. Institute of Animal Physiology at Babranam, Cam-bridge. Dr. Pierce obtained the degree of Ph.D. from the University of London in 1954 and D.Sc. from the same University in 1964. During 1954-55 Dr. Pierce spent a period as Ian McMaster Fellow at the McMaster Laboratory of the Division of Animal Health and returned in 1962-63 under a CSIRO grant to undertake further research.

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RAINMAKING IN AUSTRALIA

Controlled experiments on isolated cloud systems made in different parts of eastern Australia had shown convincingly that rain could be stimulated to fall from supercooled clouds, Dr. Bowen, Chief of the Division of Radiophysics, told the Advisory Council when it met in Sydney last month.

Dr. Bowen said that in inland regions cumulus-type clouds were unlikely to rain naturally until the cloud tops attained temperatures of -15° to -20° C.

However, if they were seeded with silver iodide they could be stimulated to produce light rain when the cloud top fem-perature was -6° C, and there was a high probability that copious rain would fall if the top temperature was -10° C or colder.

In well-developed clouds, yields of up to a million tons of water — equivalent to half an inch over 30 square miles — had been obtained for the expendi-ture of only 20 grammes of silver iodide.

This result was thoroughly well established and well under-stood, and provided excellent justification for carrying out cloud-seeding operations when cloud-seeding operations when an emergency situation due to drought or bushfire existed.

In fact, cloud-seeding con-stituted the only known means of ensuring that the maximum possible precipitation was ex-tracted from the weather sys-tems which occured over the first of the start of the start of the sys-tems which occured over the tenus which occured over the affected areas. Operations of this kind were necessarily limited to areas where clouds satisfying the right conditions were found.

These conditions could occur in most parts of the interior and were of relatively frequent occurrence in eastern Australia, particularly on the western slopes of the Dividing Range.

There were other regions however, which offered little promise for relief operations of this kind, for example the far this kind, for example the far interior, where suitable clouds only appeared on very rare occasions, and the coastal regions within 50 miles of the sea where clouds of the right kind, if they appeared, were likely to rain of their own accord.

Dr. Bowen said that the re-sults obtained from seeding individual clouds suggested that it should be possible to in-crease the average rainfall in areas where the frequency of occurrence of suitable cloud was relatively high.

Experiments carried out by the Division in recent years had established that conditions suitable for seeding existed in many parts of the eastern half of Australia, and indicated that under favourable conditions in-creases of 20% to 25% could be achieved in many of these rations regions.

A recent finding—which was totally unexpected—was that the effect of seeding persisted for some time after seeding stopped.

This contributed usefully to This contributed user uny to the overall precipitation in a region but it tended to mask the true contribution due to seeding, unless the experiments had been designed in a special way to take account of persis-

Dr. E. G. BOWEN

An experiment now in pro-gress in Tasmania was designed in this way.

An increase in excess of 25% had occurred during the first year of seeding and the existence of a strong persistence effect was confirmed.

Investigations carried out so far indicate that the whole of that part of eastern Australia on the western slopes of the Dividing Range, extending from Victoria into the southern part of Ouenelaud and from part of Queensland and from a point about 50 miles from the coast to a distance of 200-250 miles inland was likely to be suitable for the application of large-scale cloud seeding.

This was true also of the central and eastern half of Tasmania, the only region of that State excluded being the west coast.

Suitable conditions probably occurred over large parts of western and northern Australia as well, but no experiments had yet been carried out to assess their potential.

The whole of the far interior of Australia appeared un-promising as far as existing methods of seeding were concerned.

In these regions clouds suit-able for seeding occurred only rarely. The same applied to much of South Australia.

A great deal of attention was now being given to cloud seeding in many parts of the world.

The only process recognized as promising was the seeding of supercooled cloud with silver iodide, and the majority of large-scale operations were based on this technique.

The main centres of activity were in the United States, Russia, Israel, and Japan, and in these countries increases in precipitation of 10% to 15% had been claimed as a result of cloud seeding.

The economic implications of cloud seeding had not yet been fully assessed, but in terms of water yield the process was orders of magnitude cheaper than some schemes which had been considered.

The basis cost of dispensing silver iodide into the atmo-sphere was not high and a single aircraft could effectively cover an area in excess of 10,000 square miles, for an annual cost of \$50,000.

That is, large areas of inland Australia could be covered continuously at a cost which was less than 1 cent per acre per annum.

acre per annum. In a hydro-electric region where there was an immediate financial return from additional water, it had been reliably estimated that a 1% increase in precipitation would pay for the whole operation.

In agricultural regions the break-even figure was more difficult to assess but probably did not exceed 5%. In the agricultural case, timing was also important.

For example, in the Riverina every additional half-inch of rain during the August-September season meant an



Above: One of the Cessna aircraft used by the Division of Radiophysics for cloud-seeding experiments.

additional $2\frac{1}{2}$ million in the wheat yield. There were many agricultural regions in which similar considerations hold.

The wise and efficient appli-The wise and encient appli-cation of cloud-seeding tech-niques obviously required careful design and proper utilization by the authorities who were most knowledgeable and most skilled in these matters matters.

matters. These authorities were the Departments of Agriculture and Water Conservation of the various State Governments, and it was they who were clearly in the best position to take responsibility for the de-sign and conduct of such operations.

In views of experimental evidence which now existed in Australia and overseas as to the possibilities of increasing rainfall by seeding supercooled clouds with silver iodide, Dr. Bowen considered that prac-tical cloud-seeding operations were now justified on a grow-ing scale. ing scale.

At the present stage At the present stage two kinds of operation would be justified. Firstly, seeding single cloud systems on an ad hoc basis in areas where severe drought conditions prevailed or where there was danger from bushfires. From the nature of these operations it would not be possible to specify the contribution made by the seeding. Secondly, operations on a two

Secondly, operations on a larger scale over designated areas, for example over the catchment areas of major river systems as a means of

increasing river flow, provided the operations were designed in such a way as to allow an assessment of the effects pro-duced by the seeding to be made made

made. In general, Dr. Bowen felt that these operations were best carried out by appropriate state authorities and that CSIRO's role in this field should not extend beyond the experi-mental and exploratory work required to establish techniques; providing training in the proper use of seeding methods and in the design and fitting of equipment; and advising on the design of any large-scale opera-tions that might be con-templated. templated.

F.A.O. Appeal

The Victorian Committee of the Freedom from Hunger Campaign is currently making a drive in Victoria for contributions as part of an Australiawide campaign.

The money will be used to give further support to F.A.O., U.N.I.C.E.F., and other U.N. projects aimed at helping developing countries raise food production.

Commonwealth and State Government Departments in Victoria have agreed to support the local committee and an opportunity will be provided for CSIRO staff in Victoria this month, to contribute the appeal.



Mrs. Jeanette Beauchamp and Mr. Fred McKittrick of the Division of Building Research take time off in the Division's grounds for a little impromptu fencing practice. Mrs. Beauchamp is a member of the squad from which Australia's fencing team will be selected for the next Commonwealth Games in Jamaica.

SAFETY NOTES

Hazards With Contact Lenses

An increasing number of men and women are now wearing plastic corneal contact lenses which can present new hazards.

Small foreign bodies which are normally washed away by tears can become lodged beneath contact lenses where they may cause injury to the cornea.

may cause injury to the cornea. Similarly, chemicals splashed into the eye may become trapped and cause extensive damage before the lens can be removed and the eye adequately irrigated. Also, accidental dislodgement of a contact lens could produce sudden incapacitation of the worker by an immediate change in vision. Careful evaluation of the use of contact lenses is recom-mended, based on a thorough study of the hazards of the job and the condition of the worker's vision. For effective eye protection, conventional safety spec-

For effective eye protection, conventional safety spec-tacles, goggles or face shields should be worn in addition to the contact lenses.

The need for such protection is increased by the fact that it is difficult to remove a lens quickly after eye injury.

J. W. Hallam, Safety Officer.

News In Brief

Assistant Chiefs

Assistant Ciners Dr. W. E. Cohen has been appointed Assistant Chief of the Division of Forest Products, and **Dr. K. A. Ferguson, Assist-**ant Chief of the Division of Animal Physiology.

Associate Chief

Dr. R. O. Slatyer has been ap-pointed Associate Chief of the Division of Land Research.

Honour

The Australian Sections of the Institute of Food Technologists have conferred their Australian award for 1966 on Dr. J. R. Vickery, Chief of the Division of Food Preservation.

The award, is for meritorious contributions to the advance-ment of food technology in Australia.

Institute Chairman

Mr. S. T. Evans, Officer-in-Charge of the CSIRO Film Unit, has been elected Chair-man of the Australian Film Institute.

The main aim of the Institute is to promote new and extended uses for film. The Institute also conducts film competitions and co-operates with other bodies in film festivals.

Associate Member

Dr. W. E. Cohen, Assistant Chief of the Division of Forest Products, has been elected an Associate Member, representing Australia, of the Committee of the Pulp, Paper and Board Sec-tion of the Applied Chemistry Division of the International Union of Pure and Applied Chemistry Chemistry.

Horticulturist

Mr. E. R. Hoare, Officer-in-Charge of the Irrigation Re-search Laboratory at Griffith, has been nominated "Outstand-ing Horticulturist of the Year" by the Federation of Australian Nurserymen's Associations.

Leather Research

Dr. B. S. Harrap of the Divi-sion of Protein Chemistry has been appointed leader of the Division's Leather Research Unit.

Representative

Mr. D. R. S. Craik will repre-sent the Treasury at meetings of the Executive and the Advisory Council. Mr. Craik succeeds

Mr. L. B. Hamilton who re-signed from the position of Treasury representative earlier this year to become Director-General of the Department of Social Services Social Services.

Professor

Dr. E. O. P. Thompson of the Division of Protein Chemistry has been appointed Professor of Biochemistry at the Uni-versity of New South Wales.

University Post

Mr. H. S. Hawkins of the Agri-cultural Liaison Unit at Head Office has resigned to accept an appointment in the United States. He is to be Resident Co-ordinator of the Interna-Co-ordinator of the Interna-tional Communication Seminars organised by Michigan State University for the Agency for International Development.

Senior Lecturer

Mr. L. Peres of Head Office has been appointed Senior Lecturer in Political Science at the University of Melbourne.

Lecturer

Mr. N. Clark of Head Office has been appointed Lecturer in Civil Engineering at the Uni-versity of Melbourne.

Nuffield Grant

The Nuffield Foundation has made a grant of \$10,000 over two years to the Australian Conservation Foundation for a survey of Australia's national parks and reserves.

The survey will be carried out by Dr. J. G. Mosley, of the Geography Department, Australian National University School of General Studies, in association with Mr. F. N. Rateliffe, an Assistant Chief of the Division of Entomology and Scientific Director of the Foundation.

The aim of the survey is to assess the adequacy of Aus-tralia's system of national parks and reserves to meet the pre-dictable demands of our grow-ing population and scientific needs, notably the preservation and study of the more impor-tant vegetational types and the native fauna.

The Mineragraphic Investiga-tions group, previously an inde-pendent section, has been in-corporated into the Division of



Dr. T. S. Gregory, who refired recently as Chief of the Division of Animal Health, was farewelled formally last month by the Division and by his colleagues from universities and State government departments. Dr. Gregory, who became Chief of the Division when it was formed in 1959, has been associated with CSIRO for more than forty years. At the farewell, the Chairman, Sir Frederick White, unveiled a portrait of Dr. Gregory by Melbourne artist Louis Kahan. Our picture shows Dr. Gregory, Mrs. Gregory, and Mr. Kahan discussing the portrait.

will be known as the Minera-graphic Section of that Divi-

Screen News

Screen News The Food Preservation Film Society will screen Rene Clair's adaption of the Faust legend "The Devil's Charm" and the 1966 Sydney Film Festival hit "Peter and Paula" at 7.30 p.m. on Tuesday, 7th June, at North Ryde. Dr. B. V. Chandler (tele-phone 88 0233) would like to hear from anyone interested in joining the Society. The Forest Products Film

The Forest Products Film Society will screen the French film "Bout de Souffle" at 8,00 p.m.-on "Juesday-June 28,-in the Division's threatrette, South Malbourse Melbourne.

The 314 Film Society will screen a programme of films about film making at 8.00 p.m. on Thursday, June 23, at Head on Thi Office,

The programme 'Gunsmoke''. in w includes "Gunsmoke", in which four different editions each deal with the material for a fight sequence from the TV series, and "The Director and the Film—David Lean", in which the Director of "Dr. Zhivago" discusses some of his earlier films.

A Drain of Brains A list of collective names in basic sciences compiled by an inmate of a scientific institution.

A pile of nuclear physicists

A stream of hydrologists A grid of electrical engineers

A set of pure mathematicians A field of theoretical physicists

An amalgamation of metal-lurgists

A rainbow of spectroscopists coagulation of colloid Α chemists

A galaxy of cosmologists cloud of theoretical meteor-

ologists A shower of applied meteorolo-

gists A litter of geneticists

A colony of bacteriologists A batch of fermentation chemists

A knot of nautical engineers A labyrinth of communication

engineers reminiscence of emeritus A professors

An exhibition of Nobel Prize winners

An intrigue of council members A racket of administrators A dissonance of faculty mem-

bers

A stack of librarians A volume of library assistants A chain of security assistants

A complex of psychologists A catch of new staff members

A wing of ornithologists

Cold Shower Anyone? Cold Shower Anyone? American scientists have done it again. After a suitable period of seclusion with a charge-measuring device paid for by the Office of Naval Research, a research team from the Stan-ford Research Institute has emerged triumphant from a typ-ical American bathroom with the electrifying news that most beople get a charge out of their shower baths — a negative charge.

charge. Announcing this remarkable discovery recently to the Ameri-can Geophysical Union, the leader of the team, Dr. E. T. Pierce, said that running, splashing, tumbling, flowing water produces a negative charge, more so from cold water than hot; even more so with water flowing into a bathtub than a wash-basin; and most so when the shower is used.

Then, after plunging his rapt audience in a sea of math-matical equations, Pierce brought listeners up for air with this engaging thought. "There is much evidence" said he, "that a negative space charge in an atmosphere pro-motes a feeling of well-being.

"Perhaps the bracing effect of a shower bears more relation to its charge-generating capacity than to its body-cleaning func-tion".

Overseas Visits

Dr. F. J. Bromilow of the Divi-Dr. F. J. Bromniow of the Division of Building Research, will leave later this month on a five month visit to building research centres in New Zealand, the United States, Europe, Britain, Israel, India and Japan.

Mr. J. Conochie of the Division of Dairy Research leaves soon for Thailand, Europe, Bri-tain, Ireland, the United States, and New Zealand where he will spend three months visiting dairy research centres and cheese making plants in con-nection with his work on rind-less cheese.

Mr. R. D. Croll of Head Office will leave this month for Holland where he will attend the 14th International Training Course on Rural Extension. Course on Rural Extension. Mr. Croll will also visit groups concerned with agricultural liaison in the United States, Britain and South Africa. He will be away for three and a half months.

Mr. C. J. Culvenor, Acting Chief of the Division of Organic Chemistry, will leave shortly on a three month visit to Britain, Europe, Russia, India and the United States where he will attend a number of conferences and visit research centres concerned with the chemistry of natural products.

Dr. D. H. S. Horn of the Division of Organic Chemistry leaves shortly for South Africa, Europe, Britain, and north America where he will spend three and a half months visiting entomological and marine bioentomological and marine biological research centres in con-nection with his work on insect chemistry. He will also attend a number of conferences.

Dr. A. McL. Mathieson of the Division of Chemical Phy-sics will leave later this month sics will leave later tims month on a three month visit to North America, Britain, Russia, Eu-rope, Israel and Japan where he will attend several conferences and visit research centres con-cerned with modern methods of structure analysis structure analysis.



087-1966

Mineragraphic Section Applied Mineralogy where it

Dr. J. L. Brownscombe arrived in Sydney recently from Britain to take up a research fellow-ship in cloud physics with the Division of Radiophysics. Dr. Brownscombe graduated B.Sc. with honours from the Univer-sity of London in 1962. Since then he has been working at the Imperial College where he obtained his Ph.D. recently for his research on the electrifica-tion of ice and the charging of rime deposits.

Mr. C. T. DeB. Griffith has been appointed to the Agricul-tural Liaison Unit at Head Office where he will be con-cerned with the preparation of articles for "Rural Research" d with other liaison activities After graduating B.Sc.Ag. with



Mr. C. T. DeB. GRIFFITH

honours from the University Sydney in 1952, Mr. Griffith worked as an agricultural journalist in Australia and Britain, Since 1961 he has been Agricultural Editor of "The West Australian".

West Australian . Dr. R. I. Hamilton has been appointed to the Division of Tropical Pastures where he will work on the evaluation of im-proved dairy pastures and the factors affecting milk produc-tion from them. Dr. Hamilton graduated B.Sc.(Agr.) from McGill University in 1957 and M.S.A. from the University of Toronto in 1960. He recently obtained his Ph.D. from the University of Wisconsin where he has been working since 1962.

Miss Valerie Hull has joined the Division of Plant Industry where she will carry out ecological studies of skeleton weed. Miss Hull graduated B.Sc. with honours in 1962 from the University of New England. She obtained her



Dip.Ed. the following year and since then has been teaching science and mathematics in high schools.

Mr. J. P. K. Peeler has been Mr. J. P. K. Peeler has been appointed to the Division of Chemical Engineering where he will work on process design and evaluation. Mr. Peeler obtained his Diploma of Applied Chemistry in 1961



Mr. J. P. K. PEELER from the Royal Melbourne In-stitute of Technology and his Diploma of Chemical En-gineering in 1964 from the same Institute. Since 1961 he has been employed with the Explosives Branch of the De-partment of Sumply partment of Supply.

Mr. R. N. Podger has joined the Division of Animal Gene-tics where he will work on the testing of layer pullets in an artificial environment and on other aspects of poultry gene-tics. After graduating B.Agr.Sc. from the University of Mel-bourne in 1959, Mr. Podger spent three years with the Victorian Department of Agri-culture at its Poultry Research Centre, Werribee. Since 1963 he has been a research assistant at the Department of Animal Husbandry, University of Syd-ney. ney

Mr. T. N. Tan has joined the Division of Animal Physiology where he will supervise the After graduating B.Sc. from the University of Western Australia in 1963 Mr. Tan



spent two years studying chemical engineering at Sydney Uni-versity. Since 1965 he has been working for his M.Sc. at the University of New South Wales.

Mr. A. C. Shanahau, who graduated B.Sc. from the Uni-versity of New South Wales last year, has been appointed to the Beef Cattle Research Unit of the Division of Animal Physiology where he will study the nutrition and reproduction of beef cattle in Northern Australia. Mr. Shanahan studied for his degree while working with the Division of Textile Physics.





Eighteen year old Danielle Binzer, a technical assistant at the Soil Mechanics Section, has inspired all the young males around the laboratory to the point where a group of them have got together to sponsor her in this year's Miss Australia Contest. Danielle — her hobbies are reading, acting and modern ballet — will enter as Miss CSIRO. The purpose of the contest is to raise money for the Australian Cerebral Palsy Association which helps spastics. The contestant who raises the most money is crowned Miss Charity Queen. Mr. Keith Wenham, the Administrative Officer at Soil Mechanics, is looking after the financial side of Danielle's fund-raising activities and would be happy to receive any donations. He would also like to hear from the Secretaries of any CSIRO Social Committees who are interested in supporting Danielle in her good work. in her good work.

Mr. D. J. Tongway has joined the Division of Plant Industry as an analytical chem-ist at the Riverina laboratory, Deniliquin. Mr. Tongway obtained his Diploma of Applied Chemistry from Bendigo Technical College in 1965 and since then has worked as an examiner in the Patents Office. Office.

Mr. R. A. Wallis has been appointed to the Division of Mechanical Engineering to carry out research on regenera-tive evaporative cooline two tive evaporative cooling, two phase flow, radiant cooling and forced flow boiling. Mr. Wallis obtained his Diploma of Mech-anical Engineering in 1942

Visiting Fellow

Dr. J. V. Lake of the National Institute of Agricultural En-gineering at Silsoe, England, has recently been awarded a Queen Elizabeth II Fellowship to work with the Division of Land Research.



Dr. J. V. LAKE

Dr. J. V. LAKE For the last ten years Dr. Lake has been studying physio-logical aspects of the inter-action between glasshouse plants and their environment. Dr. Lake will take part in the research programme of the Environmental Biology Group and will work particularly on the effects of environmental conditions on the gas exchanges of leaves. His main interest will be in water vapour and carbon dioxide exchanges in relation to transpiration, photo-synthesis and respiration.





Mr. R. A. WALLIS

from Sydney Technical College, from Sydney Technical College, his Diploma in Aeronautical Engineering from the same college in 1945, and his Master of Engineering from the Uni-versity of New South Wales in 1954. Since 1944 he has been with the Aeronautical Research Laboratories and from 1955 to 1957 he was seconded to the aerodynamics division of the National Physical Laboratory, Britain.

Dr. R. Woods arrives in Melbourne from Britain this month to join the Division of Mineral Chemistry where he will work on electrocatalysis. Dr. Woods graduated B.Sc. in 1956, M.Sc. in 1960 and Ph.D. in 1964, all from the Univer-sity of London. Since last year he has been a research fellow at the University of Melbourne.

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U.N. POST FOR SECRETARY

The Secretary of CSIRO, Mr. G. B. Gresford, has been appointed Director of Science and Technology in the United Nations' Department of Economic and Social Affairs. Mr. Gresford's post will be concerned with the application of science and technology in the developing countries.

Following the United Nations' Conference on the Application of Science and Technology for the Benefit of the Less Developed Areas in 1963, the Secretary-General of the United Nations established an Advisory Committee on the Application of Science and Technology.

Mr. Gresford will head the secretariat of this Committee. The Committee has already held a number of meetings and is drawing up plans to speed up the application of science and technology in the field of development.

It has worked closely with the specialised agencies of the United Nations, which are largely responsible for action in this area.

The work of the Committee has so far covered such fields as the establishment of the basic scientific structures in the newer countries, the application of existing knowledge and the acquisition of new knowledge of particular importance to development, improving docu-mentation services in developing countries and the process of transferring technology to them, problems of science education, and means of encouraging the mobilisation of the efforts of the scientific community in developed countries to assist the developing countries in solving their problems.

solving their problems. Mr. Gresford was educated at the Hobart State High School, the Royal Melbourne Technical College and the Uni-versity of Melbourne, of which he is a graduate in chemistry and metallurgy. After some industrial experi-ence he joined the CSIRO Division of Industrial Chem-istry in 1942 and subsequently served as Officer-in-Charge of the Australian Scientific Liaison Office in London.

Office in London.

Since the war he has been at Head Office, as Assistant Sec-retary and Secretary (Industrial and Physical Sciences), and since 1959 as Secretary of CSIRO.



Mr. G. B. GRESFORD

month.

Mr. Gresford will take up

his new appointment later this

In 1957 he spent a year in the United States as a Harkness Fellow of the Commonwealth Fund at the Harvard University School of Public Administra-tion and the National Science Foundation in Washington.

roundation in Washington. He was an Australian dele-gate to the U.N. Conference on the Application of Science and Technology for the Benefit of the Less Developed Areas in Geneva in 1963 and has been closely associated with the work of the U.N. Advisory Committee on the Application of Science and Technology to Development since its incep-tion. tion.

He has also been closely con-cerned with the Commonwealth Scientific Committee, and UNESCO activities in South-East Asia dealing with science administration.

POSITIONS VACANT

The following vacancies for professional appointments are The following vacancies for professional appointments are current:
 ENGINEER (ENG1/2) - ELECTRONIC ENGINEER - Division of Plant Industry 130/785 (87)/66).
 EXPERIMENTAL OFFICER (SSO1/2) - PROGRAMMER - Division of Radiophysics 780/406 (15/1/66).
 EXPERIMENTAL OFFICER (EO1/2) - Division of Mathematical Statistics 440/189 (15/1/66).
 RESEARCH SCIENTIST (RS/SRS) - COMBUSTION OR CHEMICAL ENGINEER - Division of Coal Research 480/540 (15/1/66).
 RESEARCH SCIENTIST (RS/SRS) - BIOCHEMIST FOR CATTLE FICK INVESTIGATIONS-Division of Protein Chemistry 462/257 (22/1/66).
 EXPERIMENTAL OFFICER (EO1/2) - Irrigation Research Laboratory 300/197 (29/1/66)
 EXPERIMENTAL OFFICER (EO1/2) - Division of Food Preservation 300/439 (19/8/66).
 RESEARCH SCIENTIST (RS/SRS/PRS) - Division of Food Preservation 300/439 (19/8/66).
 RESEARCH SCIENTIST (RS/SRS) - ENGINEER-IN-CHARGE - Division of Agine Statistics 40(19/8/66).

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Death of Mr. Lightfoot

One of the men who played a major part in the creation of CSIRO died in Melbourne on June 2nd at the age of 89. He was Mr. Gerald Lightfoot who served as Secretary of C.S.I.R. from 1926 to 1944.

Mr. Lightfoot was born in England in 1877. He took his degree at Cambridge with first class honours in the Mechanical Sciences Tripos and was elected Foundation Scholar, Pembroke College, Cambridge, 1898.

After working for several years as an engineer, he was called to the Bar at Middle Temple, where he specialised in "Commercial Court" work and in patent and technical legal work.

Mr. Lightfoot came to Aus-tralia in 1906 and joined the Commonwealth Bureau of Cen-sus and Statistics where he was responsible for establishing the Bureau's Labour and Industrial Branch and extending it to the main industrial centres of the Commonwealth.

Commonwealth. In 1916 he was chosen by the Prime Minister, Mr. W. M. Hughes, to accompany him overseas to enquire into the work and organisation of in-dustrial research institutions in England and America.

On his return to Australia Mr. Lightfoot was appointed Acting Secretary of the newly formed Advisory Council of Science and Industry. He be-came Secretary when the Ad-visory Council was changed to the C.S.I.R. in 1926. Although he retired in 1944, he was retained as a consultant to the Council until 1947. In his years with the Council

In his years with the Council, Mr. Lightfoot saw it develop from a staff of 4 to over 2000 with 20 major laboratories and many field stations. As Commonwealth represen-tative on the Brickly Base

tative on the Prickly Pear Board, he played an important part in the work which resulted

in the eradication of Australia's worst weed menace. He was also closely involved in the establishment of the Standards Association of Aus-tralia and later became Chair-man of the National Associa-tion of Testing Authorities.

HONOURS

Mr. H. B. Somerset of the Executive was created a Knight Bachelor by the Queen in the Queen's Birthday Honours list. Mr. Somerset received his knighthood "for service to in-dustry and education".



Sir HENRY SOMERSET

Sir HENRY SOMERSET In addition three members of CSIRO State Committees were awarded O.B.E.'s. They were: Mr. H. N. Giles of the South Australian State Committee "for service in export industry, banking, and to government". Mr. W. J. D. Shaw, Chairman of the Queensland State Com-mittee, "for services to pastoral industry", and Dr. G. Edear of the N.S.W.

Dr. G. Edgar of the N.S.W. State Committee "for services to primary industry".

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Dr. Juan S. Salcedo, Jr., Chairman of the Philippines National Science Development Board, visited Australia last month. The Board was established in 1958 and is similar in many respects to CSIRO. Its staff now numbers about 800. Dr. Salcedo, who is a member of the Philippines Cabinet, came to Australia at the invitation of the Commonwealth Government. He visited a number of University Departments, the Department of Health, the Australian Alomic Energy Commission, and the CSIRO Divisions of Plant Industry, Entomology, Food Preservation, Land Research, Forest Products, Soils, Nutritional Biochemistry, the Chemical Research Laboratories and the National Standards Laboratory. Our picture shows him at the National Standards Laboratory with Dr. R. G. Glovanelli, Chief of the Division of Physics.

As a Filipino Sees Us

The Philippines possesses great agricultural and industrial potential if the proper technical know-how could be supplied, said Dr. Juan S. Salcedo in a recent A.B.C. "Guest of Honour" broadcast.

Dr. Salcedo recently visited scientific institutions in Australia (see page 1).

He explained that the Philip-He explained that the Philip-pines, with a population of 30 million people, has a rate of population increase of about 3.2 per cent every year, which, when considered with the pre-sent rate of increase of rice production (the staple food of 72 per cent of the people) of only 2.2 per cent every year, does not look very promising. The fruits of science and

The fruits of science and technology must be fully availed of by the farming population. There are large un-developed tracts of land in Cagayan Valley in the northern island of Luzon and in the southern island of Mindanao island of Luzon and in the southern island of Mindanao.

The Philippines produces 60 per cent of the world's coconut crop and export coconut oil in a form which can be highly improved. Rubber, coffee and cocoa are grown, and the mines produce the best chromite ore in the world, iron ore, coal, gold for export gold for export.

There are forest trees which make one of the best lumbers known to man. The country also produces fruit, cattle, water-buffalo, and chickens.

Dr. Salcedo observed the relevance of much Australian work to Filipino problems.

"Many things strike me," he said "as being of great value to Filipino scientists and to Philip-pine development.

"The results of your research on food technology, including harvesting, processing, handl-

ing, preservation and market-ing, are of great interest to us.

"You have developed an in-tensive classification, character-ization and identification of land for particular purposes, which should be of great in-terest to us, because we are trying to do the same thing on a much smaller scale. Your a much smaller scale. Your studies on animal and plant pests and diseases are out-

studies on animal and plant pests and diseases are out-standing." Dr. Saleedo was particularly impressed by the way in which scientists from several discip-lines combined to attack a single problem This sort of aproach should be emulated by Philippines In-stitutes, he said. If was needed, for example, to solve the problem of the blight

It was needed, for example, to solve the problem of the blight of the coconut, known in the Philippines as "cadang-cadang" which produces a yellowing of the leaves leading to eventual death of the tree at a period when it is most productive. So far the Filipinos have not succeeded in identifying the cause of this disease. Dr. Salcedo concluded by saying that he was going back to his homeland with a very deep impression of what could be done with a stronger and closer collaboration between Australia and the Philippines — two nations of the Pacific — in the fields of science, educa-tion, research and development.

This co-operation could be extended to other interested countries of South-East Asia, the home of one-third of the world's population, with a largely undeveloped technology.

The students were divided into small groups which each tackled a particular project on the biological and physical systems found in Port Hacking.

One group, with the help of a professional fishermun, attempted a census of some species of fish of commercial value using the capture-recap-ture method.

Seven hundred and seventy-six fish were tagged and released. Although only ten of these were recaptured during the school, the census was started as a long term study to be continued at future schools.

Another group undertook a study of soldier crab popula-tions on a mud flat near the laboratory. The populations were sampled and such things as sex ratio and size range detormined. determined.

A study of the behaviour of the crabs, by one group, carried out in conjunction with another out in conjunction with another group which examined physical and chemical aspects of bac-terial decomposition of the substratum, revealed that the population was not uniformly distributed across the mud flat but was concentrated in areas where the properties of the sub-stratum were anparently most stratum were apparently most suitable for survival.

Other groups investigated variations in bottom fauna, types and distribution of phyto-plankton pigments, zooplank-ton distribution, and variations in the chemical composition of the waters of the Port.

A group studying bacteria found polluting bacteria in one of the bays in the upper regions of the Port.

On the last day of the school, Divisional officers and students discussed the significance of the data collected and how it could be elaborated on by future schools.

VISITORS FROM OVERSEAS

Dr. I. A. Breger of the U.S. Geological Survey will arrive in Sydney later this month to spend a year with the Division of Coal Research on a Guggen-



Dr. I. A. BREGER

heim Foundation Fellowship Dr. Breger will work on the chemistry of low-rank coals and related materials.

Dr. M. Drechsler of the Fritz Dr. M. Drechsler of the Fritz Haber Institute of the Max Planck Gesellschaft, Berlin, is spending three months with the Division of Tribophysics work-ing on field ion microscopy. Dr. Drechsler was responsible for the early work on field emission and has used this technique to study defects in surfaces, crystal growth and surfaces. crystal growth, and

Dr. H. Morin, a research chemistic of the Soil Research Institute of the Soil Research Institute of the Canadian De-partment of Agriculture in Ottawa, is spending his sab-batical leave at the Division of Forest Products. He is involved in a general research pro-gramme on soil humus and is particularly concerned with the polyphenolic components of the soil. soil

While in Australia, he will study the polyphenols in euca-lypt leaves.

Below: Dr. H. Morita (left) and Dr. W. E. Hillis selecting eu-calypt leaves for investigation,

CHIEF CHARGED

Seasoned visitors to the Divi-sion of Protein Chemistry no longer greet the Chief, Dr. F. G. Lennox, with their former heartiness.

They have grown wary of his "down - to - earth" handshake. Nor do they dare slap the back that bites back.

The unsuspecting individual who extends his hand in inno-cent friendliness, only to with-draw it rapidly seconds later with a wince of pain as a thousand volts surge through him, is quick to learn.

Dr. Lennox first became one of the untouchables when a heating system was installed in the floor of his office.

Although the physical well being of his feet was thus assured throughout winter, the atmosphere in his room became so dry that every time he moved he built up an electro-static charge.

To add to his problem the carpet on his floor became very dry and acted as a perfect insulator.

In order to discharge himself, therefore, he has had to clasp the metal door-knob periodic-ally or the hand of every un-witting victim who could be beguiled into his office.

Dr. Lennox has one consola-tion. Some of the best brains in CSIRO are now grappling with the problem.



STUDENTS TAKE TO THE SEA Last May more than sixty science students from ten universities took part

in the 20th Annual School in Marine Science at the Cronulla laboratories

Above: A group of students catching fish during their census of commercial species in Port Hacking. Gift of Land by Grazier A Queensland grazier, Mr. J. Summer, has given 200 acres of his land to the Division of Tropical Pastures for its research in the Wallum or coastal lowland country of This region, which covers an area of two million acres, has a good rainfall but the soil is extremely low in several of the elements needed for plant fertilizer requirements of the soils determined.

Preliminary grazing trials have already begun and the new block will now make it possible to fully test the productive value of the region under im-proved pastures.

Mr. Summers was an early pioneer in the development of the "90-mile desert" area in South Australia where he first met and collaborated with CSIRO agricultural scientists.

Since moving to Queensland he has assisted the Division of Tropical Pastures in its work in the Wallum by producing new seed species, donating seed for experimental plantings, pro-viding stork for grazing experinew seed ap-for experimental plantings, pro-viding stock for grazing experi-ments and looking after climate recording instruments placed on his property.

ment from the southern Wal-lum, the rainfall being lower, about 40 inches, and of higher summer incidence. The Division of Tropical Pastures began its pasture in-vestigations in the northern Wallum in late 1962 and this

work has now reached a stage where promising pasture species have been selected and the ·····

The land donated by Mr. Sum-mers is at Childers, 200 miles north of Brisbane and just south of Bundaberg, and is typical of the northern Wallum.

This has a different environ-

Oueensland.

growth.

SAFETY NOTES

The Laboratory Smoke Stack

Yet another CSIRO fume cupboard has gone up in smoke. Only sheer good luck prevented the building which housed it from going up too.

The building was wooden-framed, clad with asbestos cement and lined with masonite and as such was a fire hazard under the best of circumstances.

A sand bath was used in the fume cupboard and was separated from the wooden bench top by a sheet of asbestos cement. It was heated by a rapid heat electric element

The bench became overheated and caught alight and the fire spread to the wall and up the timber stud framework. Fortunately no-one was injured and the fire was finally put out by the fire brigade.

Although the damage was not particularly extensive, the fire caused a good deal of inconvenience. In future, the sand bath will be raised from the bench to provide an air gap, a precaution which should have been taken in the first place.

Most of our fires could be avoided with a little care and forethought, so remember to have a close look at the set-up in your fume cupboard. J. W. Hallam, Safety Officer,



088-1966



David Rivett Medal

Dr. J. Philip, Assistant Chief of the Division of Plant Industry, has been awarded the David Rivett Medal for 1966. for distinguished research in the physical sciences over the past ten years.

The medal, which was insti-tuted by the CSIRO Officers' Association, is awarded every two years for outstanding re-search by members of the Organization's research staff, alternate awards being made for work in the physical and biological sciences.

Liaison Post

Mr. R. F. Turnbull of the Division of Forest Products has been appointed Chief Scien-tific Liaison Officer, London, and will take up his appoint-ment towards the end of next month.



Mr. R. F. TURNBULL

Mr Turnbull succeeds Mr. W. Hartley, who is now Scientific Attache to the Australian Embassy, Washington.

Silver Medal

Mr. J. Conochie of the Divi-sion of Dairy Research has been awarded the 1966 Silver Medal of the Australian So-ciety of Dairy Technology.

Gilruth Prize

Dr. T. S. Gregory, who re-tired recently as Chief of the Division of Animal Health, was awarded the 1966 Gilruth Prize at the annual conference of the Australian Veterinary Association in Adelaide last May. May.

Professor

Dr. D. P. Drover, who has been working with the Division of Land Research on the physical and chemical properties of rice soils at the Coastal Plains Research Station, has been ap-pointed Foundation Professor of Chemistry at the University of Papua and New Guinea.

Doctorate

Mr. M. K. Shaw of the Divi-sion of Food Preservation has awarded the degree of been Ph.D. by the University of California for his work on the growth of Escherichia coli at low temperature.

Woman Juror

Last month Miss Judith Humphreys of the Publishing Section became the first woman to be sworn in for jury service in Victoria. She was also one of the first three women jurors to actually serve on a Victorian jury.

Charity Fund

In the last twelve months the Division of Textile Industry has contributed more than \$1,600 to charity. Of this, \$448 was raised specially for the Geelong Community Chest and \$200 by the Division's Community Aid Abroad group (see below).

The Division's Social Club raised a further \$963 for various charities and last month the Club President, Mr. month the Club President, Mr. L. A. Allen, presented \$100 cheques to four separate or-ganizations, the Bethany Babics' Home, the Kardinia Children's Home, the Aborigines' Advancement League, and C.A.A.

Screen News

The Food Preservation Film Society will screen four documentaries at 7.30 p.m. on Tues-day, July 5, at North Ryde. They will be on the theme "Other Places, Other People", and will include "Two Men of Fiji" (Australian), and "Four Religions" (Canadian).

The Forest Products Film Society will hold its Annual General Meeting at 8 p.m. on Wednesday, 27th July, in the Division's theatrette, South Melbourne. The meeting will be followed by a screening of Walt Disney's "The Vanishing Prairie" Prairie"

The 314 Film Society will screen the Marlene Dietrich classic, "The Blue Angel" at 8 p.m., Thursday, July 21, at Hard Office 8 p.m., Thu Head Office.

residents have to buy the water and collect it from the tank in drums This tank provided the town with a constant but limited supply of water for many years. However, with the growth of population the supply has failed on several occasions and water has had to be carted nearly 100 miles by road at great expense.

Earlier this year the En-gineering and Water Supply Department of South Australia called tenders for supplying a desalting plant for Coober Pedy and a number of tenders were submitted by Australian and overeas firms. and overseas firms.

Residents of Coober Pedy, the little opal-mining town halfway between Adelaide and Alice Springs, will soon be drinking fresh water from the

world's biggest solar distillation plant.

The solar still, which will

have an area of 75,000

square feet, is based on a

design by the Division of Mechanical Engineering and will be installed this

year by the Engineering and Water Supply Department of South Australia.

The still will convert salt water from a nearby bore to fresh water at an average rate of 3,500 gallons a day. In hot weather, a daily output of 6,500

Coober Pedy's population ranges from about 250 in the summer to 1,000 in the winter.

The average rainfall is only 5 in. a year and long periods occur without any rain what-

At present the town's fresh

There is no reticulation and

water comes from a 500,000 gallon surface tank fed by a ground catchment of about 120

gallons can be expected.

ever.

acres.

and overseas firms. After examining these, how-ever, the Department decided to construct a solar still modelled on a prototype still which the Division of Mech-anical Engineering has been operating successfully for more than two years near Northam in Western Australia.

In western Australia, The Western Australian still, which has an area of 4,500 square feet, produced 146,000 gallons of fresh water in its first two years of operation.

It consists of a series of long shallow pans, each running be-tween two parallel troughs 3½ feet apart.

These pans and troughs are formed by covering a metal frame-work with black poly-thene sheeting. A simple glass roof is then placed over the lot.

Salt water is fed into the pans and is heated by the solar energy absorbed by the black pans and is heated by the solar energy absorbed by the black polythene. Some of the water is converted to vapour which then condenses on the under side of the glass roof and trickles down into the side troughs where it is led away to a storage tank.

The whole process is con-Into whole process is con-tinuous and no maintenance is required other than an occasional inspection of the protective fencing and of the glass roof to check for broken panes of glass.

No serious operating prob-lems have been encountered and the still has proved re-markably immune to the effects of rain, hail and high winds.

Our picture above shows the 4,500 square foot solar still installed by the Division of Mechanical Engineering near Northam in Western Australia.

Community Aid Abroad

In just over one year, Community Aid Abroad groups at Head Office and at the Divisions of Forest Products and Textile Industry have raised \$1,000 to develop a poultry farm at Madras Christian College.

The three C.A.A. groups in CSIRO have chosen as their next project an appeal for \$1,000 to provide the Ravals of India with the necessary capital to form a land co-operative.

The Ravals are a tribal people in the Mehsana District of Gujarat State, who in the past earned meagre incomes as transport workers.

All their cartage was done with donkeys and camels, but today they are finding it in-creasingly difficult to find em-ployment, as larger contractors are using trucks, which are far more efficient.

The Ravals have always been The Ravais nave always been a very poor social group and were not in the position to purchase trucks, and many are now looking for other sources of employment.

Some of the Ravals hope to be able to turn to agriculture

be able to turn to agriculture for a living. The farming of vegetable crops on river flats during the dry season has proved most successful in many areas of Lodie India.

Through such a project up to 60 Raval families could considerably increase their in-comes, and provide valuable vegetables to local communities.

As a group of individuals, each would have to tender to the Government annually for the use of this land. However, if they form a co-operative farming society, the Govern-ment will grant them the land without tendering.

They are hoping to form a co-operative society, and seek a lease to farm the seasonal flats at the River Sarbarmati, as they own little land themselves.

The \$1,000 raised by the CSIRO C.A.A. groups will be provided as a loan, and on re-payment will be used to assist the formation of other co-operative societies, or to enable other people to join this society.

With \$1,000 the Ravals will be able to raise further loans of up to \$5,000 from a bank.





APPOINTMENTS TO STAFF SIAMESE ARISTOGRAT

Mr. J. Beretka has been ap-pointed to a fellowship in the Division of Building Research, where he will undertake re-search on gypsum. After graduating from the Technical University in Budapest, Mr. Beretka came to Australia in 1956. He has since been en-gaged in industrial research



Mr. J. BERETKA

with Philips Electrical Indus-tries and Australian Paper Manufacturers. Mr. Beretka graduated M.Sc. from Adelaide in 1962.

Dr. T. Biegler has joined the Division of Mineral Chemistry, where he will work in the electrochemical group. After graduating Ph.D. from Sydney



Dr. T. BIEGLER

in 1962 he spent two years as a Research Associate at the Uni-versity of Illinois. Since 1964 he has held a similar appoint-ment at the University of ment at Bristol.

Mr. P. P. Hanlon has joined the Computing Research Sec-tion and will be stationed in Melbourne Since graduating M.Sc from the University of Melbourne last year, he has been a computer programmer on the staff of the Department of Defence.

Dr. R. H. Goodwin has joined the Division of Ento-mology, and will be stationed at Armidale. After graduating from the University of Cali-



Dr. R. H. GOODWIN

fornia in 1956 he taught high school biology at Oakland, California. Since 1961 he has been engaged in entomological research at the University of California, Berkeley.

Mr. R. M. Lowe has been appointed to the staff of the Division of Chemical Physics. After graduating from the Uni-versity of Melbourne in 1959



he joined the Division of Tribo physics, where he remained until 1964. He has lately been on the staff of H. J. Heinz and Co.

Dr. M. A. McDowall has been appointed to the Division of Plant Industry as a molecular biologist. Dr. McDowall is a graduate of Otago University. He obtained his Ph.D. from the



Dr. M. A. McDOWALL

University of Utah in 1963 and since then has been with the University of Queensland, firstly as a senior demonstrator and more recently as a lecturer in biochemistraty. biochemistry.

Mr. H. J. Hurle, a graduate of the University of Mel-bourne, has joined the Comput-ing Research Section as a programming consultant. He will be retiremed in Metheway will be stationed in Melbourne. Since graduation he has been

teaching mathematics and science, lately at Camberwell High School.

Dr. W. Saurer has joined the Horticultural Research Section where he will carry out vine breeding and plant selection studies. Dr. Saurer obtained his Diploma in Science from the Federal Institute of Tech-nology, Switzerland, in 1962. He was recently awarded the



Dr. W. SAURER

degree of Dr.Sc.nat.ETH. by the Institute for his work on the self fluorescence of proteins and nucleic acids.

Mr. A. Winters arrived in Sydney last month from Britain to join the Division of Fisheries and Oceanography where he will carry out time series analyses of sea level records for



Mr. A. WINTERS

the Tasman and Coral Seas and the Indian Ocean. A graduate of the University of Liverpool, Mr. Winters has spent the last two years at the Admirally Re-search Laboratory, Teddington.



Above is Alagana Kymble, a five months old Siamese Scal Point. Mr. Kymble recently won first prize in the under six round. Mr. Kymble recently won hist prize in the under six months section of the Royal Sacred Siamese Cat Club show at East Brighton, Melbourne. Also in the picture is Mr. Kymble's proud owner, Miss Anne Witchell of the Division of Mechanical Engineering.

Overseas Visits

Mr. P. J. Beck of the Division of Protein Chemistry will leave shortly on a seven month visit of leather research laboratories, lanneries and leather manufac-turers in Britain, Germany and Italy.

Mr. W. W. Bryan of the Division of Tropical Pastures left recently for overseas. He will attend the 10th Inter-national Grassland Conference in Helsinki and will visit grass-land research centres in Britain, Europe and the United States before returning to Australia in before returning to Australia in mid-November.

Mr. L. R. Clark of the Divi-sion of Entomology left last month for Hawaii, North America, Britain and Europe, where he will visit research centres concerned with popula-tion ecology. He will return in mid-October.

Mr. J. L. Corbett of the Divi-sion of Animal Physiology left recently on a three month visit to West Germany, Britain, Fin-land and Russia where he will attend a number of conferences and visit research centres con-cerned with the nutrition and physiology of domestic animals, particularly sheep and cattle.

Mr. G. S. Cottew of the Divi-sion of Animal Health will leave Australia shortly for Turkey where he will spend a year on an F.A.O. assignment as Myco-plasma Expert at the Sheep Diseases Research Lab-oratory, Pendik.

Dr. F. Grau of the Division of Food Preservation left re-cently on a three month visit to Europe, Britain, Russia, North America and New Zealand. He will attend the In-ternational Microbiology Con-gress in Moscow later this month and will visit research centres concerned with the microbial spoilage of meat.

Mr. K. A. Harper of the Division of Food Preservation left recently for Scotland where he will spend twelve months at the University of Strathclyde. Mr. Harper will also attend the 2nd International Congress of Food Science and Technology at Warsaw.

Mr. J. F. Nicholas of the Division of Tribophysics will leave shortly on a four week visit to the United States where he will visit research centres and deliver a paper at the Physical Metallurgy Gordon Conference, Rhode Island.

Dr. J. R. Price of the Execu-tive left last month on a four-week visit to the United States. Britain and Europe. Dr. Price attended the 4th International Symposium on the Chemistry of Natural Products at Stock-holm holm.

Dr. A. L. G. Rees, Chief of the Division of Chemical Physics, left recently on a short visit to Britain and Switzerland. Dr. Rees will attend a meeting of the Executive Committee of the International Union of Pure and Applied Chemistry in Zurich later this month.

<image><complex-block><image>

Printed by CSIRO, Melbourne



TO REPORT RESEARCH THE WOOL INDUSTRY

More than a hundred representatives of the Australian wool industry met at the Division of Textile Industry, Geelong, on Tuesday, 19th July, and Wednesday, 20th July, to learn something of CSIRO's recent research on wool production and wool textiles.

The meeting, which was chaired by Sir Frederick White, Chairman of CSIRO, brought together delegates from the principal woolgrower and wool textile organizations of Australia.

Scientists from eleven Divisions engaged in research on wool production and wool textiles were present.

were present. Mr. B. V. Fennessy of the Division of Wildlife Research, told the meeting that myxoma-tosis still has an important part to play in rabbit control in Australia but it can no longer be relied on as the main answer to the rabbit problem. It must be supplemented by improved control methods based on a full understanding of the biology of the rabbit, its social behaviour, its food requirements and its population movements. At Canberra, the Division of

At Canberra, the Division of Wildlife Research is using large enclosures to study rabbits under more or less natural conditions

ditions. It has recently been shown that unweared kitten rabbits only 17 days old may survive if their mothers are killed. This knowledge has been used in poisoning trials which have confirmed that poisoning opera-tions are more effective if done when rabbits are not breeding. Other research on various

when rabbits are not breeding. Other research on various scent glands which rabbits use for marking out the boundaries of their territories and for identifying their own and other groups could lead to the development of useful attrac-tants or repellants.

tants or repeilants. Dr. D. F. Stewart, Associate Chief of the Division of Animal Health, spoke about the recent discovery that footrot in sheep may be controlled by an injec-tion of a penicillin-strepto-mycin mixture.

tion of a penicillin-strepto-mycin mixture. In trials on properties where footrot had been present con-tinuously for several years, single doses had produced a high percentage of cures. It looks as if trimming and a single formalin footbath in-crease the percentage cured by injection. Some trimming is probably necessary so that all infected sheep can be detected. If the need for thorough paring can be avoided, much of the labour required in present methods will be eliminated. One man can trim the feet of up to 300 sheep a day, and the cost of injection may not be excessive. excessive.

excessive. Dr. K. A. Ferguson, Assistant Chief of the Division of Animal Physiology, reported that sheep fed a ration normally sufficient to produce 4 to 7 lb. of wool a year can be made to produce 15 to 20 lb. of wool simply by introducing small quantities of protein directly into the fourth stomach, or abomasum, through a tube. However, they found that when the same amount of protein was fed to sheep so that it had to pass through the other three stomachs first, the increase in wool growth was negligible.

The experimental techniques used to achieve this boost in wool production are not yet a practical proposition for graziers. A simple and econom-ical method for increasing the amount of protein reaching the sheep's abomasum is being sought sheep's sought.

Mr. L. F. Myers of the Divi-sion of Plant Industry, described a study of what plants sheep eat in the shrublands and drier areas of the Riverina. Sheep are far more discriminating than was expected.

In one extreme case it was found that sporobolus grass, which made up less than one per cent of the available green feed, was eighty per cent of the diet.

diet. In a grass-land paddock in the late summer when sheep are usually short of feed they select fissure weed, a small but deep-rooted perennial of the bluebush family. This little plant has such a small yield per acre that it is difficult to measure, but its importance to the sheep at this time of the year is beyond doubt. Again, it has been found that

year is beyond doubt. Again, it has been found that cotton-bush, which is highly regarded by the industry, is not very useful. Although cotton-bush is very productive it is not the cotton-bush which produces the results but other plants associated with it.

Dr. F. H. W. Morley, Assistant Chief of the Division of Plant Industry, told the meeting that the efficient use of rainfall is probably the main factor in the economical management of the Australian pastoral industry.

Pasture mixtures which make the best use of the total rain-fall of an area should be used and lucerne is well worth con-sidering as a major pasture plant plant.

Lucerne uses summer rainfall very efficiently but it may be inefficient in some areas in winter. On the other hand, species such as phalaris and

subterranean clover use winter rains efficiently but are not so efficient with the summer rains.

In an experiment at the Divi-sion of Plant Industry's Ginnin-derra Experiment Station near Canberra, over the months of January, February, March and early April, two flocks of Border-Leicester-Merino cross Jambe ware arrard respectively lambs were grazed respectively on two different pastures to determine their live weight gain.

An annual improved pasture produced 6 lb. gain per acre, while a complete lucerne diet gave 300 lb. gain per acre, all on four inches of rain.

On four inches of rain. Dr. M. Lipson, Chief of the Division of Textile Industry, spoke about the new process for shrinkproofing developed by the Division. Its advantage lies in the economy of the solutions used and the very high level of shrink resistance imparted to a wide range of wool products, particularly knitwear. Develop-ment of the process is now well advanced and a reasonable volume of treated garments should be available in a year or two. two.

two. A CSIRO process patented in 1951 and a recent U.S. process, each using different techniques, deposit nylon type resins on the wool fibres and provide good shrinkproofing qualities. How-ever, expensive organic solvents are required for both these pro-cesses.

The latest CSIRO process involves a different resin. It also uses water instead of organic solvents to deposit the resin, and is therefore much cheaper.

First class shrinkproofing qualities are provided by the process, which also eliminates pilling of knitwear, without affecting the traditional desir-able characteristics of wool to any extent any extent.

Mr. V. D. Burgmann, Chief of the Division of Textile Physics, spoke on the subject of wool testing. He said that test-



ing of wool in Australia is expanding and already over five per cent of the clip is tested. The methods used give fairly satisfactory results but are slow and expensive. The current charge by the Australian Wool Testing Authority for a Yield Certificate is \$10 plus 35c a bale. bale

bale. A commercial firm has been brought in to engage in a col-laborative design study with the Division so that a production prototype can be produced. When completed, the system will be made widely available to help reduce costs of wool testing and to handle the in-creasing number of tests.

Dr. F. G. Lennox, Chief of the Division of Protein Chem-istry, described the Division's work on yellowing. The tendency of wool to yellow when exposed to sunlight has limited its use for certain kinds of clothing.

Research has confirmed that vellowing is caused by ultra-violet radiation. Yellowing of garments is more rapid in Dr. M. Lipson, Chief of the Division of Textile Industry, makes a point to Mr. D. D. von Bibra, a member of the Aus-tralian Wool Board.

summer than in winter because of the higher proportion of ultraviolet radiation in summer sunlight.

Some of the amino acid con-stituents of wool proteins have been shown to be particularly susceptible to damage by ultra-violet radiation. The possibility of preventing yellowing by modifying these amino acids is being examined.

A treatment has been devised which reduces the rate of yel-lowing without causing any undesirable changes, but the effect is partly lost when gar-ments are washed. The Division is trying to improve the dura-bility of this treatment.

The Division is also looking at methods for whitening yellowed wool, such as the in-corporation of white pigments.



CONSERVING THE CRAYFISH

The Western Australian cravfishery is the most important single marine industry in Australia. The 1964-65 period saw about 16 million pounds of crayfish landed.

Most of the catch is exported to America as frozen tails, and export income from this source for 1964-65 was about \$14 million.

The fishery grew steadily in post-war years, reaching a peak in 1963. By this time it was evident that the fishable stock was becoming very severely denleted. depleted.

More men were using more and more pots with relatively little increase in overall catch. Fishermen were always on the move hoping to find an un-fished reef.

fished reef. Research on the Western Australian crayfish, *Panulirus cygnus*, is a joint effort by the CSIRO Division of Fisheries and Oceanography and the Western Australian Fisheries and Fauna Department. The creation occurs on coastal

The species occurs on coastal and offshore reefs between North West Cape and Cape Leeuwin. The crayfish are caught in pots, baited and set

Crayfish larvae like this are found in the currents hundreds of miles off the West Aus-tralian coast. Length of the body is just over an inch. Just how they return to the reefs is uncertain. in clusters around reef outcrops and rock ledges. If possible, the pots are pulled up daily.

Slock assessments have shown that the fishable popula-tion of crayfish decreased from about 140 million pounds in 1944 to about 35 million pounds in 1963.

Over the same period the catch increased from 0.6 mil-lion pounds to 21.4 million pounds. It became evident that some

form of stock conservation was urgently needed to ensure the future well-being of the industry, In 1963 fishing was limited

In 1963 fishing was jimited by regulation. Restrictions were placed on the numbers of pots which could be used. At the same time biological re-search into the life history of the crayfish was accelerated. As research progressed it be-came evident that the key to stabilization of the industry

came evident that the key to stabilization of the industry probably lay in the mainten-ance of some satisfactory level of recruitment each year of young crayfish into the fishable population.

The Western Australian cray The western Australian Cray-fish has a quite complex life history. After hatching from the eggs carried on the under-side of the female, the young crayfish, in the form of larvae,

leave the breeding reefs and travel considerable distances out to sea.

out to sea. Sampling cruises off the west coast of Australia have picked up these larvae as far as 700 miles from their hatching reefs. These larvae do not re-turn to the reefs until a much later stage in their life history has been reached.

Just how they make these ex-tensive migrations is not yet clear, but the migrations clearly have an important bearing on the annual fluctuations of recruitment into the fishable stock.

As well as studies on larval distribution and dispersion, the research workers investigate growth rates and behaviour of immature crayfish on the reefs.

Young craylish are caught, marked by a tail punch or other means, and released. If they are recaptured, an esti-mate can be made of their growth rate.

The locality of recapture provides a clue as to whether the young crayfish move around on or between reefs, or if they stay in one place.

Results suggest that the in-dustry is at present largely dependent on the recruitment into the fishable population of crayfish of just legal size.

It has also been found that It has also been found that annual recruitment has de-creased because of increased mortality of undersize crayfish, directly or indirectly as a result of their capture in crayfish pole pots.

reduce this mortality To To reduce this mortality fishermen must now by regula-tion incorporate escape gaps in their crayfish pots. Such gaps are big enough to allow most-of the undersize crayfish to compare to escape.



Crayfish pots must now be fitted with an escape slot for juveniles.

Fisheries research has con-Fisheries research has con-firmed the suspicion that cray-fish in Western Australian waters are subject to over-fishing. A quantitative estimate of the degree of overfishing has been made.

The aim now is to stabilize the industry at a satisfactory catch level. About 16 million pounds per annum has been given as a working estimate.

If this is to be achieved, the young crayfish must be pro-tected and the numbers of legal size crayfish taken must not rise above the present level.

Perhaps one day it will be ossible to increase recruitpossible to increase recruit-ment by artificial means, by making artificial reefs for in-stance, or by rearing larval or juvenile crayfish in captivity.



Dr. F. H. S. Roberts, who re-tired from CSIRO earlier this year, has taken up a Research Fellowship at the Veterinary Parasitology Laboratory, Yeerongpilly.

Under the Fellowship he will prepare a monograph on Aus-tralian ticks.

Dr. Roberts was Officer-in-Dr. Roberts was Ollicer-in-Charge of the Laboratory for nineteen years. He has made important contributions to knowledge of ticks, and of the ecology and physiology of in-ternal parasites of cattle under tropical and sub-tropical con-ditions.

GOODBYE PRESENT



On Friday, 8th July, the staff at Head Office farewelled Mr. Guy Gresford, who has accepted an appointment with the United Nations. He was presented with an Australian landscape painting. Our picture shows Mr. Gresford with Mr. Brian McKeon, Chairman of the Head Office Social Club, and Mr. Les Graham, both of whom wished Mr. Gresford well on behalf of the staff.

Canada's Science Council

The Canadian Government has established a new advisory body, called the Science Council of Canada. Dr. O. M. Solandt, Chancellor of the University of Toronto, will be its Chairman.

Its Chairman. The appointment of 25 mem-bers of the Council will be made in the near future. With a membership drawn from in-dustry, universities, and gov-ernment the responsibility of the Science Council will be "to assess Canada's scientific and technological resources, re-guirements and potentialities and to make recommendations thereon . . .". The Prime Minister will report to Parliaand to make recommendations thereon . .". The Prime Minister will report to Parlia-ment on the work of the Science Council of Canada. Unlike the National Re-search Council, the Defence Research Board and other agencies or departments of

government, the Science Council will be exclusively advisory. While it will have no laboratories and no authority over expenditure or budgets of any government department or agency, it will call for intensive studies of science and tech-nology in Canada and serve as nology in Canada and serve as a focus for information and advice that will be useful to the people of Canada in formulating policies and plans for the future. Its professional and administrative support will be drawn from the Science Secretariat of the Privy Coun-cil Office.

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### Carbon Tetrachloride --- Killer

Carbon Tetrachloride — Killer Carbon tetrachloride is a very good solvent for grease, oil and wax, and consequently is commonly used to remove grease spots from clothes, cleaning upholstery and degreas-ing machinery. It is also used in some hobbies, to kill butterflies, clean photographic negatives and bring out the watermark in stamps. It is often considered "safe" because it is non-inflammable, unlike petrol or kerosene. What is not so commonly known is that carbon tetrachloride is highly toxic, in fact probably one of the most toxic substances commonly found in a household. There is also evidence that it can be absorbed through the skin.

household. There is also evidence that it can be absorbed through the skin. In an unventilated  $10' \times 10' \times 10'$  room, three teaspoons-ful of carbon tetrachloride will saturate the air to the danger point.

Do not use this "killer" for dry-cleaning, degreasing or other purposes.

Substitute any of the following solvents whose toxicity is considerably lower than carbon tetrachloride. • Perchlorethylene (tetrachlorethylene). • Trichlorethylene (tetrachlorethylene).

Perchlorethylene (tetrachlorethylene).
Trichlorethylene.
Trichlorethane (Methyl chloroform).
The toxic effects of carbon tetrachloride are increased many-fold by the presence of alcohol in the body.
Dr. R. M. Farrier of the U.S. National Institutes of Health tells of a classic case that happened after a party aboard a ship docked in New York City. During dinner a waiter tripped and spilled a plate of food on a coast guard officer. The next morning the officer's wife used about a quarter of a cup of carbon tetrachloride to remove the spots from his uniform.

spots from his uniform. During the cleaning, her husband lay on a couch several feet away. Since it was winter, the windows were closed and the carbon tetrachloride was confined within the room, which was average size, about  $8 \times 10 \times 12$  feet. Eleven days later the officer died in the hospital after his kidneys collapsed. Yet, the man's wife, who had breathed the same poison-filled air, did not even suffer mild symptoms of headache or nausea. The officer had drunk a few cocktails the night before, at the party; his wife did not drink. The alcohol in his system, combined with the small amount of carbon tetra-chloride, spelled the difference between life and death. J. W. Hallam, Safety Officer.

### **Oueensland Cattle Station**

CSIRO is to establish a new cattle research station in Queensland on 22,500 acres of land made available by the Queensland Government.

The new property is situated thirty miles west of Mundub-bera, due west of Maryborough, and 190 miles northwest of Brisbane.

It will be named the Narayen Research Station, after an aboriginal woman buried on a mountain forming part of the property.

CSIRO will spend over \$600,000 in establishing the research station which will be largely devoted to long term experiments designed to develop management techniques for the pasture plants and pasture mixtures, which have been developed for use on the spear-grass and brigalow regions of Queensland.

The station will also investi-gate the problem of low calving percentages amongst beef cattle in sub-tropical Queensland.

In sub-tropical Queensland. It will, in fact, investigate in sub-tropical Queensland prob-lems similar to those being investigated in tropical Queens-land by the Lansdown Research Station at Townsville.

At least 20 research scientists from the Cunningham Labora-tory at Brisbane will use the station as a major experiment centre.

centre. Dr. J. Griffiths Davies, Chief of the Division of Tropical Pastures, has expressed delight at the development and antici-pates that when sown with the new tropical grasses and pas-tures land in the region will carry one beast to three acres.

089-1966

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Harold Breen joined C.S.I.R.,

# The Emu and its Habitat

The Division of Wildlife Research has established its Western Australian headquarters at Helena Valley, about 16 miles east of Perth. Here twenty-five acres of fenced paddocks will soon accommodate several species of birds and animals for study,

Already there are mutton birds, black cockatoos and pigeons in newly-built cages, as well as a pair of emus. The emus have begun to breed and the male bird is now sitting on nine eggs.

In the Murchison district. 500 miles north of Perth, the ecology of the emu is being studied. The country, ranging from granite hills and break-aways to mulga and grass plateaux, has an eight-inch rainfall.

Emu counts are made along the vermin barrier fences which cross the State and tend to divide the wheat producing areas and farming country from the pastoral leases.

These counts, made each nonth, provide information month, about the bird's migration pattern. They are supported by aerial surveys and counts, made three times a year, over the main study area. A banding programme has also been started.

From a permanent camp in the Murchison district, the re-search team is investigating the quantity of food available to the emu.

Emus are counted along the vermin barrier fences

This research involves regular inspection of trees and plants to check growth, seed-ing, and fertility, and observa-tions to determine the abund-ance or otherwise of insect prey.

Checks are being continually made on humidity, rainfall and temperature in the area. Over a period of years, the team hopes to gain a clear understanding of the emu and its habitat.



#### Brief News

### **Contract** Let

A \$1,399,875 contract has been let for construction of a labora-tory for the Division of Radio-physics.

The work will be carried out by E. A. Watts Pty. Ltd. over a period of 21 months.

The new laboratory will be on a 14 acre site at Epping, N.S.W.

#### Professor

Dr. D. R. Miller, of the Physical Metallurgy Section, has been appointed to a new Chair of Materials Science in the department of chemical engineering at the University of Adelaide Adelaide.

#### Trustee

Dr. M. F. Day, Member of the Executive, has been appointed a Trustee of the Kosciusko State Park.

### New Booklet

The research activities of the The research activities of the Wool Research Laboratories are reviewed in a booklet en-titled "CSIRO and the Wool Textile Industry" which has just been released. The booklet is the third in the series dealing with CSIRO research related to various branches of industry. The earlier booklets were "CSIRO and the Food Indus-try" and "CSIRO and Engineer-ing in Industry". The intention is to cover most of the research work related to secondary inwork related to secondary in-dustry in a series of about eight booklets.

The new wool textile booklet also replaces one produced in 1960 entitled "Wool Research 1960 entitled "Wool Research Laboratories in CSIRO". It was first released on the occasion of the meeting between the Executive and wool industry representatives at Geelong on July 19-20. It is intended to provide an account of the wool textile research work suitable for inquirers without special knowledge of wool textile manufacture.

Fellowship A Ludwig Leichhardt research fellowship is available for an Australian scholar who wants to pursue advanced academic research in West Germany during 1966/67.

The fellow will receive a monthly allowance of DM1,000 and incremental allowances for his family. Travel is provided for the appointee only.

Applications close on 31st August. Further information is available from the Editor of Coresearch

### For Inventors

The Inventors Association of Australia will conduct an exhibition/competition for in-ventors from 18th-23rd September in Sydney.

The entrance fee is \$1.00 for each entry, and two prizes of \$500 each are to be awarded. The Association's address is Box 3400, G.P.O.. Sydney.

Doctorate

# Mr. E. T. Linacre, of the Irri-gation Research Laboratory, Griffith, has been awarded the Ph.D. degree of the University of Lorder

### of London. Survey

A new book called "Agricul-tural Education in Australia" was published last month by the Australian Council for Educational Research.

The author is Dr. R. N. Farquhar, of Head Office, who was seconded to A.C.E.R. to carry out the survey reported in the book.

### Radioheliograph

The Ford Foundation has made a further grant of \$U.S. 80,000 to CSIRO to enable completion of the Division of Radio-physics' radioheliograph at Culgoora. The Foundation pro-vided \$550,000 for the project in 1962.

Dr. J. S. Dryden, of the Divi-sion of Applied Physics, leaves this week for the United States, where he will attend a Gordon C on feren cc on Dielectric Phenomena at New London, N.H. Dr. Dryden will move on to Europe in September, where he will lead the Aus-tralian delegation to the Inter-national Union of Pure and Applied Physics General Assembly in Basle.

Mr. J. L. Farrant, of the Division of Chemical Physics, leaves this month for Japan, where he will attend the VIth International Congress of Elec-tron Misser Ward Electron tron Microscopy at Kyoto. He will pay a short visit to America to visit Cornell Uni-versity before returning home in September.

in September. Dr. K. O. Godwin, of the Division of Nutritional Bio-chemistry, leaves this month for a two months visit to New Zealand, the United States and Britain. In America he will attend the 1st International Symposium on Selenium in Biomedicine at Corvallis, Oregon. Oregon.

Mr. E. R. Hoare, Officer-in-Charge of the Irrigation Re-search Laboratory, left last month for the United States and Europe. He will attend the XVIIIth International Horticultural Congress this month at Maryland College. In Britain, he will deliver sets of lectures to the Universities of Nottingham and Southamp-ton and to the National College of Agricultural Engineering.

ton and to the National College of Agricultural Engineering. Dr. A. R. Johnson, of the Division of Food Preservation, left this week for Europe and the United States. He will give papers to the 13th World Poultry Congress at Kiev, the 2nd International Congress of Food Science and Technology at Warsaw, and the Fall Meet-ing of the American Oil Chemists' Society at Phila-delphia. delphia.

Mr. D. F. Kelsall, of the Division of Chemical Engineer-ing, left recently on a visit to the United States, Britain and Europe. He will attend a

as it was then known, on 1st January, 1927, that is to say, within about 12 months of the His appointment closely fol-lowed that of the late Sir David Rivett to the position of Chief Executive Officer. The position to which Mr. Breen was ap-pointed was known initially as Chief Clerk and Accountant, but in 1936 the designation was changed to Assistant Sec-retary (Finance and Supplies). reconstitution of the Institute of Science and Industry under the

DEATH OF Mr. H. P. BREEN

For the present generation of CSIRO staff, it is probably

quite unknown that the late Mr. Harold P. Breen, whose death occurred on 6th July, 1966, was for a period of 13

years, a distinguished member of the staff.

The comparatively rapid ex-pansion of C.S.I.R. in its early formative years called for the exercise of considerable skill in the design and development of its administrative structure. Harold Breen successfully ap-plied his talents to this task.

new title of Council for Scien-tific and Industrial Research.

He was a skilled administrator and he possessed the full confidence and esteem of the Executive Committee. He made a notable contribution to the success of C.S.LR.

success of C.S.LR. Shortly after the outbreak in 1939 of World War II, the Executive Committee agreed to loan Mr. Breen's services to the Department of Supply and Development for a period of three months. Shortly after this period elapsed a further request was made for the loan of his services for an indefinite period. Thus he left C.S.I.R. in 1940 — never to return— to serve with various War Departments. Departments

At the time of his retirement rom the Commonwealth Public Service Mr. Breen occupied the position of permanent Head of the Department of Supply and Development. For his services to his country he was awarded the decoration of C.B.E.

Gordon Conference on the be-haviour of particulate systems in Milwaukee this month and a European Symposium on Comminution in Amsterdam in September.

Dr. W. M. McKenzie leaves this month for the United States. He will spend a year at the University of California, studying basic cutting with Professor E. Thomsen.

Gordon Conference on the be-

Mr. O. B. Williams, of the Division of Animal Physi-ology, leaves in August for Britain, where he will spend a year working at the Nature Conservancy's Monks Wood Experimental Station. En route to London, he will stop over in Jodhnur, Beirut and Jerusalem to discuss arid zone problems. problems.

Mr. G. W. Walls, Assistant Chief of the Division of Textile Chief of the Division of Textile Industry, left last month on a short visit to the United States, Britain, Europe and Japan. While in America he will visit Cleveland to discuss the Divi-sion's Sliver converter project with a licensee firm.

Dr. B. P. Moore, of the Division of Entomology, leaves this month for the United States. He will spend a year at the Harvard Biological Laboratories, working on in-sect pheromones. His visit is Supported by a grant from the supported by a grant from the U.S. National Science Foundation



### Visits **Overseas**

Dr. W. Adcock has joined the staff of the Division of Organic Chemistry. After graduating Ph.D. from the University of Queensland he proceeded to the University of Texas, where he worked under Professor M. J. S. Dewar, F.R.S. He will study new organic derivatives of titanium and zirconium.



Dr. W. ADCOCK

Dr. Iva M. Beatty, an organic chemist, has joined the staff of the Division of Entomology. Since taking her B.Sc. degree at Queensland and her Ph.D. at the Australian National Uni-versity, she has been a Research Fellow in the John Curtin School of Medical Research at the A.N.U.

Mr. S. George, a graduate of the University of Sydney, has been appointed to the staff of the Division of Textile Physics. He will investigate some of the problems of sampling the Aus-tralian wool clip. Mr. George was previously a technical officer with B.A.L.M. Paints Ltd.

Dr. R. J. Gilkes is at present en route to Australia to join the Staff of the Division of Soils. After a few months in Adelaide he will be stationed at the Cuuningham Laboratory, Brisbane. Dr. Gilkes recently completed a Ph.D. in geology at the University of Southampton, after taking his B.Sc. in physics at the same university.

Mr. R. D. MacDonald has been appointed to the position of senior microanalyst in the Division of Organic Chemistry. A graduate of the University of London, he was for ten years with the microanalytical division of the May and Baker Research Institute. Since his arrival in Australia a year ago he has been with I.C.I.A.N.Z.



Mr. R. D. MACDONALD

Dr. H. C. Martin has been appointed to a research fellow-ship in the Division of Meteorological Physics. Since graduat-ing from the University of Manitoba in 1961, he has been doing research at the University of Western Ontario. Dr. Martin's field concerns evaporation microstructure and the humidity.

Mr. W. S. Matheson has joined the staff of the Division of Mechanical Engineering, where he will study the utiliza-

tion of computers in program, development, engineering design and theory of automatic control systems. Since graduat-ing B.E.E. with honours in 1964 he has been working for the M.Eng.Sc. degree at the University of Melbourne.

Miss Norma Newton has joined the Division of Plant Industry, where she will be re-search assistant to the Chief. search assistant to the Chief, After graduating from Sydney University in 1959 she worked under Dr. M. R. Lemberg, F.R.S., at Royal North Shore Hospital. After earning an external M.Sc. degree for her work there, she went to America to senent two years at America to spend two years at Dartmouth Medical School, New Hampshire.



Miss NORMA NEWTON

Mr. A. Ono has been appointed to the staff of the Division of Radiophysics. He has been at Tokyo University for about fifteen years, as student, lecturer, and lately as a doctoral candidate. Mr. Ono will work in the Division's cloud physics group.

Mr. A. Pinkerton, a graduate of the University of Glasgow, has joined the staff of the Divi-sion of Plant Industry. He will be stationed at the Tobacco Re-



Mr. A. PINKERTON

search Institute, Mareeba. After post-graduate experience at Ox-ford, at the Macauley Institute, and at Rothamsted, Mr. Pinker-ton spent eight years with the



"If it's what I think, we've a helluva dig on our hands!" Copyright "Punch".

National Agricultural Labora-tory in Kenya.

tory in Kenya. Mr. N. Ruglen has joined the staff of the Division of Mech-anical Engineering, where he will study air flow in ducts and the design of fans. A mech-anical engineering diplomate from the Royal Melbourne In-stitute of Technology, he has been on the staff of the Aero-nautical Research Laboratories, Department of Supply, since 1953.

Mr. W. B. Sparrow has been appointed to the position of veterinary officer in the Division of Nutritional Biochemistry. After graduating M.R.C.V.S.



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Mr. W. B. SPARROW

from London in 1951, he served as a veterinarian for two years in Northern Nigeria before entering general practice in Britain. Since 1955 he has been with William Cooper and Nephews, firstly in Britain and since 1961 in Australia.

Mr. G. F. Taylor commenced duty earlier this year with the Division of Coal Research. He will study the high temperature solid state chemistry of the



inorganic constituents in fuels. After graduating from the University of Adelaide in 1962 he remained in the Department of Physical and Inorganic Chem-istry to work for his Ph.D.

Mr. A. Turner has been ap-pointed Administrative Officer of the Division of Building Re-search. Mr. Turner graduated



from the R.A.A.F. Academy at Point Cook in 1953 and en-gaged in operational flying in Australia and overseas. Al-though he left the R.A.A.F. in 1962 to enter private industry he has retained his interest in the carrier or more bert of the service as a member of the Melbourne University Squadron. He is also an Hon-orary A.D.C. to the Governor of Victoria.

089-1966



This is Alison Shaw, blue-eyed, brown-haired daughter of Mr. N. H. Shaw, of the Division of Tropical Pastures. Alison was recently chosen "Miss Science" in the University of Queensland's Miss University Quest.

Dr. R. W. Taylor has joined the staff of the Division of Entomology, where he will continue his studies on ants. After graduating from the University of New Zealand he proceeded to Harvard University, where he took his Ph.D. in 1963. He has since remained at Harvard on a post-doctoral fellowship.

Professor B. Torssell arrived in Australia last month to take up a fellowship in the Division of Land Research. After taking his Ph.D. degree at the Royal Agricultural College of Sweden in 1959 Dr. Torssell visited the United States under a Kellogg Fellowship, and later held a research fellowship at the University of Minnesota. He is now an associate professor of plant husbandry at Uppsala.

Mr. Vu The Bao has been appointed to a research fellow-ship in the Division of Radiophysics. He came from Viet-nam to Australia in 1957 to read engineering at Adelaide.



Mr. VU THE BAO

obtained a first - class He He obtained a hrst-class honours degree in electrical engineering, and has just com-pleted a Ph.D. thesis. Mr. Vu will study the theory and be-haviour of large aerial structures.

### **Rabbit Fleas From Spain**

The Division of Animal Genetics recently obtained permission from the quarantine authorities to import live specimens of

the European rabbit flea. Miss Miriam Rothschild, the eminent naturalist and authority on fleas collected in Spain and despatched to Australia the contents of five rabbits' nests.

Nine adult European rabbit fleas were alive when the consignment was received at this

The fleas are now breeding on pregnant female rabbits, but the population is still quite small.

small. The object of this work is to have available a vector for myxomatosis virus which will function in any season. The principal vector at present is the mosquito, which is only active in a warm, moist en-vironment. Indigenous rabbit fleas are poor vectors, as they tend to remain on one rabbit. The European rabbit flea has two advantages. Firstly, its

The European rabbit flea has two advantages. Firstly, its activity is not affected by seasons. Secondly, it likes to move about frequently from one rabbit to another. The efficiency of myxoma-tosis may be greatly enhanced if control authorities have a suitable vector available for release in any season. It would enable the disease to

release in any season. It would enable the disease to be used more strategically against rabbit populations which are uninfected, partly infected, or immune to some strains only. If the Division is successful in breading a large neuropulation

in breeding a large population, the quarantine authorities will be asked to approve trial releases



### FOR CIRCULATION AMONG MEMBERS OF CSIRO STAFF - NUMBER 90, MELBOURNE, SEPTEMBER 1966

# \$41,740,500 FOR CSIRO Head Office Changes

CSIRO will have a total budget for 1966/67 of \$41,740,531 for capital and non-capital expenditure, of which \$32,628,500 will be provided directly by the Government, and \$9,112,031 by Industry Committees and other contributory sources.

### **Treasury Funds**

Of the amount of \$32,628,500, provided under the Treasury appropriation, \$28,720,000 is for salaries and general running expenses, \$3,671,500 for capital expenditure and \$237,000 for repairs to buildings.

The allocation for salaries and running expenses represents an increase of \$2,968,291 over the expenditure for 1965/66.

Inescapable salary increases arising from increments, reclassifications, arbitration adjustments, and the recent basic wage decision, will absorb \$1,208,000 leaving \$1,760,291 available for other purposes.

Of the latter amount the Executive decided to allocate \$710,000 to cover additional maintenance and travelling expenses. This decision was taken after a detailed examination of the actual expenditure for 1965/66 as compared with the budget for that year.

Some of the over-expenditure on maintenance was due to such things as inflation, but by far the greater part of it was due to increased research activity following the acquisition of new equipment and the appointment of additional supporting staff.

The sharp rise in expenditure on travel was due partly to increases in fares and in travelling allowance rates as well as to the large number of expensive overseas visits undertaken during the year.

Having provided for the inescapable increases, the Executive then decided to make available \$320,000 for a number of projects which were started last year, and also to proceed with some new projects. Grants for projects started in or before 1965/66 are: biological control of insect pests (\$50,000); pasture and animal research on Queensland cattle station (\$62,000); extraction of minerals (\$30,000); control of regrowth of shrubs and trees in summer rainfall areas (\$14,000); research by Division of Meteorological Physics (\$16,000); and expansion of micro-analytical services (\$10,000).

Grants for new activities include: studies of water loss by plants (\$18,000); tropical airconditioning (\$60,000); and developmental projects(\$60,000).

The new budget includes provision for 150 new positions, including those required for the above activities. Most of these positions will be used to appoint supporting staff.

The capital allocation from Treasury is divided into two categories — those items controlled by CSIRO and those handled by the Departments of Works and Interior.

Works and interior. The first group will absorb \$1,292,000. This will be spent mainly on development works at field stations (\$400,000), the purchase of major items of equipment costing over \$10,000 (\$650,000), and capital expenditure for the development of the new cattle station now being established near Mundubbera, Queensland, for the Division of Tropical Pastures.

Of \$2,173,000 provided for projects under the control of the Department of Works, \$1,473,000 will be needed for buildings under construction, while the rest will cover works commenced in previous financial years.

The major item in the current year's New Works programme is \$1,200,000 for the laboratory to be constructed at Indooroopilly, Queensland, for the Divisions of Animal Health and Entomology.

#### Other Funds

The joint Commonwealth and industry research funds provide most of the finance available to CSIRO from non-Treasury sources.

The Australian Wool Board has allocated \$5,672,906, comprising \$3,058,806 for wool production research, and \$2,614,100 for wool textile research.

The wool production figure includes \$2,085,318 for salaries, and \$973,488 for other purposes, while the corresponding amounts for wool textile research are \$1,578,202 and \$1,035,898.

Each of these amounts represented is more than the allocations approved for 1965/66.

Because of the depleted state of the Wool Research Trust Fund the Wool Board was obliged to restrict the wool production allocation to the same total amount as that approved for 1965/66. This meant that inescapable increaset, such as salary increments, had to be met by reducing the funds available for capital expenditure.

On the textile side, minor increases totalling \$53,900 were approved to cover part of the estimated expenditure on inescapables.

The Meat Research Committee agreed to provide a total sum of \$1,260,600, comprising \$471,001 for salaries, \$400,000 to complete the Cannon Hill Laboratory at present under construction in Brisbane, and \$389,599 for other purposes.

The Wheat, Dairy, and Tobacco Research Committees h a v e provided \$244,007, \$248,536, and \$199,705, respectively, for research for their particular industries. A number of changes have been made in the organization of Head Office, following the departure of Mr. G. B. Gresford.

Mr. L. G. Wilson hus been named Secretary (Administration), Mr. A. F. Gurnett-Smith Secretary (Agricultural and Biological Sciences), and Mr. J. P. Shelton Secretary (Industrial and Physical Sciences).

Head Office will continue to be divided into three branches.

The Administrative Branch, under Mr. Wilson, will be responsible, in association with the Executive, for all general administrative matters, and the



Mr. L. G. WILSON

provision of services related to finance, staff, works and buildings, publicity, and special services such as the library; for the administration and coordination of the Regional and Administrative Offices, and for the provision of services in the Executive Office in Canberra.

Executive Office in Canberra. The Agricultural and Biological Sciences Branch under Mr. Gurnett-Smith will be responsible, in association with the Executive, for matters affecting the agricultural and biological divisions; for the provision of advice to the Executive in this field, and the interpretation of Executive policy to



Mr. A. F. GURNETT-SMITH

the relevant divisions; for advice and assistance to the Executive in the review and assessment of new and existing research programmes; for keeping in close touch with agricultural industry and with agricultural bodies and committees; and for the provision of an agricultural liaison service. The Industrial and Physical

agricultural liaison service. The Industrial and Physical Sciences Branch, under Mr. Shelton, will be responsible, in association with the Executive, for matters affecting the industrial and physical sciences divisions; for the provision of advice to the Executive in this field, and the interpretation of Executive policy to the relevant divisions; for advice and assist-

ance to the Executive in assessment of new and existing research programmes; for keeping in touch with industry generally and with industry bodies and committees; for the provision



Mr. J. P. SHELTON

of an industrial liaison service; negotiations with industry for contract-sponsored or other forms of co-operative research, and for all CSIRO patenting and licencing activities.



Mr. P. F. BUTLER

Mr. P. F. Butler has been designated Assistant Secretary in the Agricultural and Biological Services Branch of Head Office.

### **New Division**

The Executive has decided to combine the Divisions of Organic Chemistry and Physical Chemistry into a Division of Applied Chemistry with Dr. S. D. Hamann as its Chief. Dr. Hamann was formerly Chief of the Division of Physical Chemistry.

These moves follow the appointment of the former Chief of the Division of Organic Chemistry, Dr. J. R. Price, to the Executive.

The new division will be a member of the Chemical Research Laboratories and will be closely concerned with problems of the chemical industries.

The division will continue to operate the instrument and microanalytical service and this will still be available for use by industry and other CSIRO research groups.

It will also work on problems involving a high content of organic chemistry or physical chemistry or both, such as fire control and air and water pollution.

| SUMMARY OF ESTIMATES OF EX                                                                                      | <b>VPENDITURI</b>               | E FOR 1966-6                    | 7                             |
|-----------------------------------------------------------------------------------------------------------------|---------------------------------|---------------------------------|-------------------------------|
|                                                                                                                 | Estimates<br>1966-67<br>S       | Expenditure<br>1965-66<br>\$    | Increase or<br>Decrease<br>\$ |
| Under CSIRO control                                                                                             |                                 | Ŷ                               |                               |
| Salaries and running expenses                                                                                   | 28,720,000                      | 25,751,709                      | 2,968,291                     |
| items                                                                                                           | 1,292,000                       | 1,319,230                       | - 27,230                      |
| Total under direct control of CSIRO                                                                             | 30,012,000                      | 27,070,939                      | 2,941,061                     |
| Under Department of Interior control<br>Acquisition of sites and buildings<br>Under Department of Works control | 66,500                          | 59,600                          | 6,900                         |
| Fittings and furniture                                                                                          | 140,000<br>237,000<br>2,173,000 | 130,671<br>199,687<br>1,869,882 | 9,329<br>37,313<br>303,118    |
| Total CSIRO — Treasury Funds                                                                                    | 32,628,500                      | 29,330,779                      | 3,297,721                     |
| Contributory Funds<br>Investigations — salaries and general running<br>expenses                                 | 8,374,219                       | 8,054,879                       | 319,340                       |
| items                                                                                                           | 737,812                         | 839,244                         | - 101,432                     |
| Total funds CSIRO - all sources                                                                                 | 41,740,531                      | 38,224,902                      | 3,515,629                     |
| items                                                                                                           | 737,812                         | 839,244<br>38,224,902           | 3,515,6                       |

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# **OPERATIONS RESEARCH AND THE BUILDING INDUSTRY**

For the first thirty-five years of its life, CSIRO stuck fairly closely to the recognized "natural" sciences, like physics, chemistry and biology. If the study of animal behaviour seemed legitimate the study of human behaviour did not.

So the establishment, in 1963, of a small operations research unit in the Division of Building Research was quite a radical step. Industrial economics and human behaviour patterns became for the first time subjects for formal CSIRO investigation.

The Division of Building Rethe Division of Building Re-search like several other "in-dustry" divisions has always given the utmost consideration to the needs of the industry it serves.

During the 'fifties it became quite apparent to the Division that some of the building in-dustry's most pressing problems had nothing to do with build-ing materials.

The problem concerned such things as methods of construc-tion, job organization, and the availability of capital and labour.

In Britain, the D.S.I.R. Build-ing Research Station had begun to use operations research techniques. Operations research is a difficult discipline to define: it involves the use of a number of scientific, mathematical, stat-istical and logical techniques to generate quantitative informa-tion on which can be based decisions about operations.

In 1962 Dr. J. C. Weston, who was in charge of the

D.S.I.R. operations research work, was invited to Australia. He recommended to the Execu-tive that the CSIRO Division of Building Research should enter the field.

In 1963 Mr. W. B. Kennedy was appointed to establish a small group, which now com-prises five people.

One of the first techniques to be used by the group was net-work analysis, sometimes called critical path analysis.

In the construction of a build-ing, many operations cannot be started until other operations are completed. Thus you can't put the roof on your house till the walls are up, though you can build the front steps at almost any stage any stage.

The construction plan of big building is made up of a maze of operations, and a net-work representation shows these in their correct sequence.

There can be many alterna-tive paths from the beginning to the end of the maze.

to the end of the maze. If every activity is begun as soon as all the necessary pre-ceding jobs are finished, then the duration times for each activity can be added up. The longest duration is the critical path, the minimum time in which the building can be finished finished.

Intelligent use of network analysis can produce dramatic effects. A special form of it, called Project Evaluation and Review Technique (PERT) was



first used in America on the construction of the Polaris weapon system. As a result, the project was completed in half the originally estimated time.

the originally estimated time. Nearer home, two television stations, one in Melbourne and one in Sydney, were granted licences on the same day in May, 1963. In the construction of one studio, PERT was used. It began telecasting 15 months later, 8 months before its counterpart was ready. For several reasons the

For several reasons, the CSIRO group decided to design

Food Preservation on Show

On Thursday, August 4th, eight hundred people visited the Ryde laboratories of the Division of Food Preservation to see a display of research activities.

work on freeze drying. It has long been known that frozen foods can be dried, without thawing, by subliming the ice to water vapour under vacuum. But the process has been rather too expensive as a com-mercial\_proposition for all but the most expensive foods. The Division has found a

The Division has found a way of achieving greatly in-creased sublimation rates by varying the vacuum pressure cyclically.

Beefsteak, crayfish, prawns and mushrooms have been suc-cessfully freeze-dried in a pilot plant. Drying is up to 30 per cent quicker using the cyclic

The process is being patented,

process,

prawns

been

Exhibits were staged in a large number of rooms in the food science and food technology blocks and in the processing area.

Visitors were invited to take part in tasting tests in the Division's taste laboratory. Subjects of the exhibits included meat quality, egg investigations, fruit storage, microbiology, flavour chemistry, juice concentration, pea processing, electron microscopy and packaging.

Of special interest was the

Below: Mr. D. Lovett, Mr. E. G. Hall, and Dr. N. Parker pre-paring the freeze-drying exhibit for the Open Day.

manufacturer.

Another exhibit showed the result of recent experiments on the preservation of bananas.

Green bananas kept in the atmosphere under reasonably cool conditions begin to ripen about a fortnight after picking.

Experiments at North Ryde Experiments at Norm Kyde have shown that respiration can be reduced to a very low level if the fruit is stored in an atmosphere containing five per cent of carbon dioxide and only three per cent of oxygen.

Under these storage condi-tions it has proved possible to delay the onset of ripening for at least six months. Packing bananas in cases with

polythene liners is a practical and effective way of extending storage life by a few weeks.

a computer program to enable network analyses to be made on local building projects.

Firstly, no program was avail-able for the Organization's Conable for the Organization's Col-trol Data computer system. Secondly, the group had definite views about the sort of pro-gram that was needed to pro-vide outputs which would suit various types of management structure.

The program was also wanted for the experimental study of abstract models, not representa-tive of actual real-life buildings. buildings. buildings.

The computer program has been used on several large pro-jects already. The Victorian Housing Commission, in par-ticular, has used it on some of the big multi-storey apartment blocks which are now rising in Melbourne's inner suburbs.

Use of the program on a large apartment block in Carlton showed how proper scheduling of drawings and documents and performation prefabrication of components and could enable commencement of the job to be advanced by six months.

Interest in network analysis is spreading. The CSIRO program has been used for a High School in Melbourne, and will soon be used for another in Canberra.

The National Capital De-velopment Commission is inter-ested in applying PERT to its construction program, and to individual building projects within the program within the program.

The special use of network analysis for scheduling the pro-duction of drawings and docu-ments is also being taken advantage of. There may be over 1,000 drawings involved in a big project like the new International Air Terminal at Mascot, for which tenders will probably be called next year.

The technique will also be used for this purpose in Stage Three of the Sydney Opera House Project.

So far, the work is experi-mental. Members of the group are acting as unpaid consultants to builders who are using net-work analysis. The costs of work analysis. The costs of making and modifying network analyses are carefully recorded, to determine just how effective they are as a means of reducing overall costs.

Another line of attack on the problems of the building in-dustry involves the construction of conceptual "models", or mathematical representations of real-life economic situations.

Of particular interest is an input-output model, now being designed.

CSIRO has helped the Vic-torian Housing Commission by making network analyses on these high-rise apartment blocks in Melbourne.

The inputs, approximately forty in number, will be measures of the availability of various classes of skilled labour, building materials, serviced and suitably located building sites, money for capitalizing building operations, and money for spending on building. The outputs are houses, flats and a dozen other categories of

and a dozen other categories of building.

The model can be used to calculate the effects of variation in any particular input (such as shortage of copper, or of skilled bricklayers). Equally, one can prescribe certain changes in out-put (such as a 10 per cent increase in a certain type of building) and calculate the con-sequent needed change in in-puts. And economic models can be used to predict un-planned fluctuations in demand. The successful use of opera-tions research requires more than techniques. It requires data about operations.

about operations.

Plenty of statistics on the overall activities of the building industry are available. It is on the micro-scale that statistics are sadly lacking.

For what percentage of his forty hours is a carpenter actually sawing, hammering. forty hours is a carpenter actually sawing, hammering, drilling, planing and mcasuring? For how much of the time is he doing useful work?

When he stops, is it because when he stops, is it because he is waiting on another trades-man, because he's run out of nails, because someone else is in the way, or because he needs a smoke? Are people often waiting around for other jobs to be finished?

Surprisingly this sort of in-formation is not available, so the Division must collect it. The raw data will be obtained by time-lapse cinematography on actual building jobs.

Annual investments in build-ing and construction in Aus-tralia are nearly \$2,000 million, or one-eighth of our gross national product.

If the operations research group can point the way to even small percentage savings, they will have amply justified themselves.

And success would surely encourage the spread of re-search on the applicability of operations research to other in-dustries which are big users of labour.



# News In Brief

### Doctorate

**Doctorate Mr. H. B. Wisely** of the Division of Fisheries and Oceano-graphy has been awarded the degree of D.Sc. by the Univer-sity of Canterbury, New Zealand, for his work on the underwater protection of ships' hulls against corrosion and marine fouling.

#### Silver Medal

Mrs. Jeanetic Beauchamp of the Division of Building Re-search was a member of the women's fencing team which gained a silver medal for Aus-tralia at the recent Common-wealth Games in Jamaica.

### **Credit Society** Manager

Mr. J. Belkin has been appointed full-time manager of the CSIRO Co-operative Credit Society where he will be responsible for its day-to-day management.



Mr. J. BELKIN

Mr. J. BELKIN Mr. Belkin spent 17 years with CSIRO at Head Office and the Chemical Research Labora-tories before resigning in 1956 to take up a managerial posi-tion with a finance company. He has held other similar posi-tions over the past ten years, and has wide experience in the fields of finance credit control and office management. All enquiries should now be addressed to Mr. Belkin.



**Dr. A. E. Pierce**, who was appointed Chief of the Division of Animal Health earlier this year, arrived in Melbourne last month to take up his new post.

# International Lecture

Dr. J. R. Vickery, Chief of the Division of Food Preservation, has been chosen by the Food Group of the Society of Chemical Industry, London, to deliver its first International Lecture on 21st September. Dr. Vickery will speak on the scope and status of food science.

### Confusing

An enquirer approached Head Office last month with a ques-tion about aborigines. When told that CSIRO did not en-gage in anthropology, he be-came indignant. "Then why", he asked, "do you have a Divi-sion of Tribophysics?"

### Wine Tasting

Wine Tasting One of the many attractions at the CSIRO Ball in Melbourne this year will be free cham-pagne. The Organizing Com-mittee, in a remarkable display of dedication, has put many hours of hard work into choos-ing the champagne. The Ball will be held in the Royale Ballroom on Thursday, 6th October, from 8.30 p.m. to 2.00 a.m., and there will be two bands, Denis Farrington's and The Strangers. Tickets are only \$8 a double.

Our picture below shows the Our picture below shows the panel of volunteer wine tasters who have given so unstintingly of their time. They are from left to right: Miss Geneviove Slack (Animal Health), Miss Danielle Le Grand (Protein Chemistry), Miss Margaret Geraghty (Head Office), Miss Anna - Rogers - (Mineral Chemistry), and Miss Heather Hogg (Chemical Research Laboratories). Hogg (Cher Laboratories).





### BIOLOGISTS **DISCUSS SOIL** PROBLE

How do certain soil bacteria and moulds stimulate the growth of crops and trees? Can the friability of soils be improved by introducing earthworms, ants and beetles? Under pastures, what is the nature of the organic matter which wastefully locks up most of the nitrogen, phosphorus and sulphur applied as fertilizer?

These were a few of the questions discussed at the first Australian Specialist conference in Soil Biology, held at the Division of Soils in Adelaide from August 15th-18th.

The four-fax conference, which was organized by Drs. R. J. Swaby and K. E. Lee attracted seveniy delegates. They came from every State in Australia, from universities, Departments of Agriculture, and from five CSIRO Divisions.

The thirty-nine research papers given covered the importance of organisms in soil fertility and plant growth. The conference was formally

opened on the morning of August 15th by Dr. E. G. Halisworth, Chief of the Divi-sion of Soils.

Dr. Hallsworth said that soil Dr. Hallsworth said that soil biology was of paramount im-portance. The breakdown pro-ducts of weathered rocks could never become soils without biological activity. Soil differed from its parent material be-cause of the biological activity it had been subjected to. Indeed most of the soil features classified and mapped by soil scientists differed from one another because of the bio-logical component. logical component.

On the evening of the first day the work of the Division's Soil Microbiology and Soil Zoology Sections was displayed.

Our picture above shows Mr. J. R. Harris (left) and Miss Janis Ward of the Division of Soils examining clover plants with Professor N. J. Flentje of the Waite Agricultural Research Institute. The growth of the small clover plant held by Miss Ward has been affected by toxins produced by the bac-terial decomposition of straw.

### SAFETY NOTES Death in a

### **Sleeping Bag**

A sixteen year old boy died recently in a sleeping bag that had been dry cleaned with per-chlorethylene in a commercial unit.

The bag was received from the cleaners in a roll and put straight into the car boot. It was unrolled inside a hike tent, and the boy slept in it for eight hours

hours. He did not regain conscious-ness and was in convulsions when found. Autopsy showed death was due to the cleaning solvent. This sleeping bag had not been properly aired, and there was sufficient residual perchlor-ethylene to cause death. All sleeping bags n e e d

All sleeping bags n e ed thorough airing after cleaning and again before being put into use. The filling is bulky, and removal of the final traces of solvent is a slow process. The unaired bag is particu-larly dangerous in the confines of a small hike tent.

J. W. Hallam, Safety Officer.

### POSITIONS VACANT

The following vacancies for professional appointments are current:

- RESEARCH SCIENTIST (RS/SRS) PLANT PHYSIOLOGIST Division of Plant Industry 130/792 (2/9/66). ENGINEER (Eng 2/3) - Division of Plant Industry 130/796 (9/9/66).
- EXPERIMENTAL OFFICER (E01/2) -- ORGANIC CHEMIST/ BIOCHEMIST -- Division of Plant Industry 130/793 (9/9/66). EXPERIMENTAL OFFICER (E02/3) -- Upper Atmosphere Section 544/28 (9)9/66).
- EXPERIMENTAL OFFICER (E01/2) Division of Textile Physics 465/260 (23/9/66),
- RESEARCH SCIENTIST (RS) STATISTICIAN Division of Mathematical Statistics 440/190 (23/9/66). RESEARCH SCIENTIST (RS) -- PROTEIN CHEMIST -- Division of Protein Chemistry 462/266 (10/10/66).

"We must have dozed off." Convright "Punch"

Jubilee Committee Meeting Over a hundred people attended the fiftieth meeting of the CSIRO South Australian State Committee, which was held in Adelaide on 27th July.

> Among the guests were previous members of the State Com-mittee, two Vice-Chancellors (Sir Henry Basten and Professor P. H. Karmel), and two former members of the Executive (Pro-

fessor R. N. Robertson and Emeritus Professor G. M. Badger). Professor E. A. Rudd, Chair-man of the Committee was in the Chair

the Chair.

Dr. E. G. Hallsworth, Mr. H. J. Lee, Dr. E. A. Cornish and Dr. J. V. Possingham spoke to the meeting about research highlights in the Organization's South Australian laboratories. The film "Approach to Science" was shown, and the meeting concluded with an address by Sir Frederick White, who had flown to Adelaide for the occasion.

Mr. H. E. Brown has joined the Division of Coal Research as Scientific Assistant to the Chief. Mr. Brown graduated B.Sc. from the University of Sydney in 1949 and M.Sc from the



Mr. H. E. BROWN

same University in 1960. Since 1950 he has been with the Ionispheric Prediction Service of the Department of the Interior.



Mr. P. B. H. O'CONNELL

Mr. P. B. H. O'Connell has joined the Division of Food Preservation where he will study nucleic acid and protein metabolism during the ripening of fruits. Mr. O'Connell gradu-ated B.Sc. from the University of Sydney in 1962 and for the last three years has been a developmental chemist with the firm of Salmond and Spraggon.

Dr. P. J. Robinson has been appointed to the Division of Tropical Pastures and will work at Townsville on the effect of plant nutrition on the chemical composition of tropical pasture plants. Dr. Robinson graduated



Dr. P. J. ROBINSON

Ph.D. from the University of Sydney in 1965 and since then has been working with Smith, Kline and French.

Dr. P. D. Jeffrey will arrive in Australia this month to take up a post-doctoral fellowship with the Division of Protein Chemistry. Dr. Jeffrey gradu-ated B.Sc. with honours from the University of Adelaide in 1961 and Ph.D. from the same University in 1965. He has spent the last two years in the Department of Chemistry at Clark University, Massachusetts.

Visits

Dr. E. R. Seguit of the Divi-sion of Building Research leaves shortly for the University of Cambridge. He will spend nine months at the University's Department of Mineralogy and Petrology.

Dr. D. F. Waterhouse, Chief

Dr. D. F. Waterhouse, Chief of the Division of Entomology is attending the Pacific Science Congress in Japan, and will visit the University of Hong Kong before returning to Aus-tralia.

**Dr. K. R. Ryan** has joined the Upper Atmosphere Section where he will carry out re-search on the earth's outer atmosphere. After graduating B.Sc. with honours from the University of New South Wales



in 1959 and Ph.D. from the same University in 1963, Dr. Ryan spent two years with the Aero-Space Research Labora-tories Office of the U.S. Air Force. Since then he has been lecturer in physical chemistry at the University of Canterbury.

Dr. M. Shibaoka will arrive in Australia this month from Japan to take up a post-doctoral fellowship in combustion science at the Division of Coal



Dr. M. SHIBAOKA

Research. Dr. Shibaoka graduated in Engineering from Hokkaido University in 1951. Since 1954 he has been lecturer in coal geology at Hokkaido University and in 1956 he was awarded the degree of Doctor of Engineering.

Dr. C. J. Matthews has been appointed to a post-doctoral fel-lowship in combustion science with the Division of Coal Re-search. Dr. Matthews recently obtained his Ph.D. from the University of Liverpool for his esearch on gas-phase oxidation.



Above are some of the seventy children from Geelong orphanages who enjoyed themselves at a barbecue arranged by the Division of Textile Industry Social Club last July. Members of the Division and their families drove the children to the barbecue in their cars and altogether 140 people took part in the fun and games.



Although Marceba has a population of less than 5,000 this year's annual Rodeo attracted 12,000 visitors. Perhaps one of the reasons was the Rodeo Queen, 20 year old Margaret Wicks of the Division of Plant Industry's Tohacco Research Institute at Marceba.

Dr. D. P. Kelly will arrive in Canberra later this month from England to join the Divi-sion of Plant Industry. He will work in the Baas-Becking Biogeological Research Labora-tory on the biological and chemical processes associated with the formation of mineral deposits. Dr. Kelly graduated B.Sc. with honours from the University of London in 1961 and Ph.D. from the same Uni-versity in 1965. Since then he has been working at University College, London, on the meta-bolism of sulphur bacteria.

W.M.O. POST

Mr. I. C. Mcliroy of the Divi-sion of Meteorological Physics will take up a one year appoint-ment with the World Meteoro-logical Organization early next year at the Meteorological Iu-stitute for Research and Train-ing Cairo. ing, Cairo.

Mr. McIlroy will assist with the formation and development of the Institute, which will form part of the Meteorological Department of the United Arab Republic.

### Washington Job

Any yonng senographer plan-ning a working holiday in the United States may be interested in a vacancy in the Office of the Australian Scientific Attaché in Washington.

Applicants should be able to write shorthand at 100 words a minute and type at 60 words a minute. The salary is \$U.S.4,641. Fares to and from Washing-ton will be the responsibility of the individual and not the Com-monweith

monwealth. Mr. G. D. McLennan at Head Office would be pleased to hear from any CSIRO staff or friends of staff who may be interested in this position.

Mr. B. R. Smith has been appointed to the Division of Chemical Engineering where he will work on diffusion and surwill work on diffusion and sur-face chemistry in relation to membrane processes. Since graduating M.Sc. from the Uni-versity of Auckland in 1962. Mr. Smith has been working for his Ph.D. in the Physical Chemistry Department at the University of Sydney.

# Visitors

Dr. M. Zaitlin, Associate Professor of Agricultural Bio-chemistry at the University of Arizona is spending twelve months with the Division of Plant Industry on a fellowship awarded by the Australian-American Educational Founda-tion. Dr. Zaitlin will work on the physiology and biochemistry of defective tobacco mosaic virus strains. virus strains.

Professor F. Yoshida of the Department of Chemical En-gineering. Kyoto University,



Professor F. YOSHIDA

Japan will leave Australia shortly after spending two months in Australia during which he visited the Divisions of Coal Research. Food Pre-servation, Chemical Engineer-ing, and the Western Australian Laboratory of the Division of Applied Mineralogy.

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Overseas Europe, Britain and the United States. Dr. Sanders will also attend a number of international conferences.

Mr. P. L. Eisler of the Division of Mineral Chemistry left last month on a two month visit to the United States, Britain, and Holland to gain experience with pulsed neutron generators.

Mr. W. E. Hillis of the Divi-sion of Forest Products left last month for Japan where he is attending the 11th Pacific Science Congress. Mr. Hillis will be away for five weeks and will also visit forest products laboratories in the Philippines.

Mr. J. E. Peterson of the Division of Animal Health left recently for Japan where he will attend an International Congress on Electron Micro-scopy. He will also visit virus research centres in the United States before returning to Aus-tralic of the year. tralia at the end of the year.

**Dr. J. V. Possingham**, Officer-in-Charge of the Horticultural Research Section, is attending the Pacific Science Congress in Japan. He will be away for six weeks and will also visit Singa-pore, Thailand, Hong Kong and the Philippines. the Philippines.

Dr. C. H. B. Priestley, Chief of the Division of Meteoro-logical Physics, and Mr. W. C. Swinbank of the same Division, left Australia last month for Japan where they are attending the Pacific Science Congress. They will also attend a sym-posium on boundary layers and turbulence, and will visit meteorological research centres in Japan before returning to Australia at the end of the month.

Dr. J. V. Sanders of the Division of Tribophysics left last month on a four month visit to research centres in Japan,



### **JUBILEE OF NATIONAL** SCIENCE AUSTRALIA

Fifty years ago the Commonwealth Government established an Advisory Council of Science and Industry. This event marked the Commonwealth's entry into the field of scientific research.

To commemorate this event, the Executive has commissioned a book and an exhibition. The book, called "The Origins of CSIRO" was published on September 30th.

The exhibition, which is being staged in Parliament House, Canberra, was officially opened by the Minister, Senator Gor-ton, on Tuesday, 27th Septem-ber. It has already been seen by parliamentarians and by several thousand members of several thousand members of the public, and will be closed after Monday, 3rd October.

after Monday, 3rd October. The exhibition will be put on again in the Academy of Science building on the 8th, 9th and 10th November, to coincide with a meeting of the CSIRO Advisory Council in Canberra. The exhibition may be shown in Sydney and Mel-bourne within the next few months. months.

bound within the next few months. The display consists of 42 hexagonal panels, 7 ft. high and 6 ft. wide. They are linked together in groups of three to form a series of free-standing units on which text and photo-graphs are displayed. It was designed and constructed by the firm of Peter Hutchinson and Associates. The first six panels cover the period 1916 to 1926 and trace the steps which led from the formation of the Advisory Council of Science and Indus-try in 1916 to the Council for Scientific and Industrial Re-search in 1926.

search in 1926. These are followed by nine panels which trace the history of C.S.I.R. until the eventual establishment of CSIRO in 1949. Much of the emphasis is on the Council's pre-war achievements, which were mainly in the agricultural field, and to the scientific contribut.

mainly in the agricultural field, and to the scientific contribu-tion of the Council to Aus-tralia's war effort. In the 21 panels on CSIRO which follow little attempt is made to trace the historical development of the organiza-tion over the last 17 years or to summarize its many achieve-ments. The aim has been to show the wide scope and variety of CSIRO's activities today. today.

Other panels show the loca-tion of CSIRO laboratories and field stations, how CSIRO is financed, and how CSIRO spends its money.

### The Book

The BOOK "The Origins of CSIRO" by Sir George Currie and J. Graham. Melbourne University Press. 200 pp. \$4.00. In 1901, when the first Parlia-ment of the Commonwealth assembled, some members were advocating Federal interest in scientific research, aimed par-ticularly at assisting agricul-ture.

In 1926, Parliament enacted In 1920, Farliament enacted the Science and Industry Re-search Bill, which set up C.S.I.R. This book is an ac-count of the efforts, in the years between, to establish a national research organization.

Briefly, the events which occurred were as follows: A bill to establish an Australian Bu-reau of Agriculture was in-troduced in 1909, but allowed to lapse. The same fate over-took a similar bill introduced in 1913. in

The Hughes Government, in

in 1913. The Hughes Government, in 1916, established an Advisory Council of Science and Indus-try, and an Act creating an Institute of Science and Indus-try passed into law in 1920. "The Origins of CSIRO" sets out to fill in the gaps. Who were the advocates of the project? Who were the tactics, the arguments, the issues? Why did it take twenty-five years to establish a viable institution? The authors have delved deeply into old documents and records, and have consulted some of the surviving pioneers. The story they have to tell confirms some expectations, but contains a good many surprises. We are not astonished, for in-stance, to learn that a Queens-land member condemned the 1913 Bill as "socialistic, even communistic". In the early, uneasy, days of Federalism there was much

communistic". In the early, uneasy, days of Tederalism there was much concern that the Common-wealth might usurp the proper functions of the States. Quite as frequently expressed was the contention that Com-monwealth entry into the re-search field would cause un-necessary duplication of effort. And much argument centred

necessary duplication of effort. And much argument centred on the form of organization of a research body. It was a political article of faith that scientists could not be trusted to organize anything, and that executive control should rest with "men of affairs". Few members of the CSIRO staff will have heard of Freder-ick Hagelthorn, a Minister in the Victorian Parliament. Yet he deserves the greatest credit for making the project possible. It was Hagelthorn whose strong advocacy and shrewd political manoeuvres broke down the resistance of the States.

States. The The "designer" of C.S.I.R. and the true hero of the book is Sir David Orme Masson, sometime Professor of Chem-istry at the University of Melbourne

bourne. It was Masson who stood up to two Prime Ministers and demanded control by scientists, an Executive rather than a single director, freedom from Public Service control and the building of national labora-tories.

The authors are nothing if not charitable in their defence of the politicians of the era. Yet Billy Hughes, in particu-lar, emerges from the pages as an unsympathetic figure. He made and broke promises

He made and broke promises regularly, seldom sought advice, acted capriciously, insulted his scientific advisers, and pro-vided only token funds for re-search. He was extravagant and flamboyant and was actu-ally capable of passages like— "Science will lead the manu-facturer into access partures by facturer into green pastures by solving for him problems that

seemed to him insoluble. It

seemed to him insoluble. It will open up a thousand new avenues for capital and labour, and lastly science thus familiar-ized to the people will help them to clear thinking; to the rejection of shams; to healthier and better lives; to a saner and wider outlook on life". It remained for S. M. Bruce, in 1925, to determine on a pro-perly financed body. But in those imperial days, no major step could be taken without consulting the Old Country. Hughes in 1916 took British advice before establishing his Advisory Council, and Bruce in 1925 asked Sir Frank Heath, Secretary of the D.S.I.R., to advise the Government on the establishment of C.S.I.R. In the last chapter of the book Bruce is quoted as saying that the new body would be "a great co-ordinating authority for the whole of the efforts be-ing made in Australia today, and not on the line of super-imposing another great struc-ture upon those already exist-ing" and, later, in the House "It is not contemplated that and, later, in the House

"It is not contemplated that research will be carried out by the Institute, but that it will be undertaken wherever the best facilities exist".

One is left wondering if the Bruce Government knew what it was creating.



The opening of the Division of Plant Industry's Pye Laboratory in Canberra on the 31st August provided an opportunity for Dr. J. E. Falk (right), the present Chief of the Division, to get fogether with his predecessors, Dr. B. T. Dickson, who was Chief from 1927-1951 and Sir Otto Frankel (left) who was Chief of the Division from 1951-1962. A full account of the opening of the laboratory may be found on page two of this issue.



Last month 15 fisheries field officers came to Cronulla from various parts of Australia and New Zealand for an annual 3 weeks instruction in principles and techniques of fisheries research. The course is conducted by research staff at the Division of Fisheries and Oceanography and administrators from State fisheries. This year, use was made of a marine science exhibit constructed by divisional staff and assembled at Cronulla to enable students to the course to relate fisheries work to general marine science activities. The display has as its theme a large transparent copy of a painting reproduced for the Australian Marine Sciences Association publication "Carcers in Marine Science". There are 5 socions in the display, Oceanic circulation, Biological diversity, Productivity, Fisheries, and Instrumentation. The photo above shows Mr. D. Rochford of the Division explaining to students the relevance of oceanic circulation to the study of marine science in general.

# **GOVERNOR-GENERAL OPENS THE PYE LABORATORY**

The new Pye Laboratory of the Division of Plant Industry was formally opened on 31st August by his Excellency the Governor-General (Lord Casey).

The building is part of a gift to CSIRO from Mr. F. C. Pye. In 1963 Mr. Pye gave the Organization an 8,500 acre property near Cootamundra, N.S.W.

The property was sold for about \$500,000, which was used to establish the F. C. Pye Re-search Fund. A little over half the Fund was expended on the new laboratory.

Lord Casey, in opening the Laboratory, recalled meeting Mr. Pye in a Sydney Club four years ago. Mr. Pye then told him of the substantial gift he had in mind.



Mr. F. C. PYE

"As you can imagine", said His Excellency, "I did not seek to dissuade him. It's not every day that Father Christmas knocks at the door."

Lord Casey said that the Pye Laboratory was the first labora-tory in the world devoted en-tirely to the physical environ-ment of plants in the field.

ment of plants in the field. The Governor-General con-cluded with a warm tribute to the generosity of Mr. Pye. "Perhaps", he said, "his splendid gift will encourage others to perpetuate their names in something like the same way, and at the same time do a lot of good for the Australian community."

Sir Frederick White, in introducing Lord Casey, said that the Laboratory would be staffed by mathematicians, plant biologists, physicists, electronic and instrument engineers.

Together they would work across the boundaries of several e conventional disciplines what were called "Field more

Interior of the Pye Laboratory showing laboratories and offices grouped around the court-yard.

Environment" studies. This is the complete study of the environment in which plants grow and produce their useful products. Sir Frederick

Sir Frederick said that studies of plants in the labora-tory reveal much that is essen-tial to our understanding. In laboratory work and partic-ularly in special laboratories (of which the phytotron is an example), the experimental con-trolled. But this is not so of plants in the field. said that

How then do we transfer our laboratory knowledge to the world at large? We cannot control the weather, the vary-ing sunlight, the changing gases, temperatures and humidity of the plant environment in the atmosphere or in the soil.

But by measurement we can know what is happening and how these elements influence plant growth and productivity.

plant growth and productivity. "This broad concept is not new", said Sir Frederick. "but Dr. Philip, the Head of the Pye Laboratory, Dr. Falk, the Chief of the Division of Plant Industry and Sir Otto Frankel deserved praise for the idea of creating a special laboratory for this purpose".

Dr. J. E. Falk thanked Lord Casey for opening the labora-tory, and expressed gratitude to all those people who had helped bring it to fruition.

helped bring it to truttion. "The architectural concept", he said, "was due to Mr. Ken Woolley, of Ancher, Mortlock, Murray and Woolley. There was no doubt that he had found a kindred spirit in Dr. John Philip, with whose con-nivance an exciting, but highly functional structure, had been evolved." Dr. Philip's team which

evolved." Dr. Philip's team, which would occupy the building, had already published about 150 scientific papers. It was a highly regarded and inter-nationally recognized research team, in such topics as the effects in the field of heat, of light, of moisture, of gas move-ments, of wind, and so on. This was all part of the

ments, of wind, and so on. This was all part of the comprehensive and continuous search for understanding which must go on more and more intensively to underpin the ever more sophisticated technology which Australian agriculture demands demands

Immediately after the open-ing ceremony Her Excellency Lady Casey and Mrs. F. C. Pye braved a relentless down-

pour to plant two snow-gums in front of the building. The Laboratory was open for inspection both before and after the ceremony. It is a square building, built on three levels.

levels. The lowest level contains a fluid mechanics laboratory, equipped with wind tunnels, stores, a workshop, and a base for mobile laboratories. Rooms on the second and third levels are grouped around an attractive terrazzo-flagged, glass-roofed central courtyard, in which tree ferns are growing. The middle floor has labora-The middle floor has labora-tories devoted to radiation, electronics, micro-meteorology, biology and soil physics. The top floor gallery opens on to two more above tories

on to two more laboratories, offices for the professional staff, and a seminar room.

For the opening, special dis-plays and demonstrations were put up in the laboratories and the seminar room.

Dr. E. F. Bradley explaining an exhibit to Lord Casey while Dr. J. R. Philip looks on.

Australia's contribution will be the provision of laboratory facilities and the organization

research arrangements in

The first party of three agronomists is expected to arrive shortly for a six months' stay, to be followed by another team six months later.

The new plan relates prin-cipally to the semi-tropical region of south-west Brazil. The Division of Tropical Pastures in Brisbane and Townsville will be the main area for the teams' work.

It is hoped that it will be possible for the teams to visit at least four states, to include the CSIRO Divisions of Plant Industry and Land Research, the Waite Agricultural Re-

ment.

of

Australia.



# Agronomists from Brazil

The Government of Brazil is to send a team of agronomists to Australia to discuss a plan for widespread pasture improvement in Brazil, and to gain experience in Australian pasture research and technology.

The scheme, sponsored by the Brazilian Ministries of External Affairs and Agriculture acting in collaboration, will be paid for by the Brazilian Governsearch Institute and State Departments of Agriculture.

Brazilian agriculturists at the International Grasslands Con-gress at Sao Paulo in 1964 were impressed by the vast strides made in recent years in Aus-tralia in the development of improved pastures and pasture species particularly in the subspecies, particularly in the sub-tropics.

The work of CSIRO scien-tists in F.A.O. and other United Nations teams in several South American countries, notably Paraguay, Argentina, Brazil and Uruguay, has stimulated fur-ther interest in pasture develop-ment ment

This interest was enhanced recently by the visit to Brazil of the Chief of the Division of Plant Industry, Dr. J. E. Falk. Dr. Falk found conditions for agriculture in large areas of South America very similar to South America very similar to those in Australia. He was par-ticularly impressed by the enormous potential for pasture improvement of large areas in Brazil.

The cattle population is already approaching 100 million on pastures given little or no development.

Brazil's interest has been stimulated by the rapid development of the Australian pasture seed industry. Pasture seed production in 1964-65 in Australia totalled 6,500 tons of which exports to Uruguay alone were worth \$1 million.

The seed is produced on irrigated pastures in the former 90-mile desert area of South Australia and in other areas in Western Australia, Victoria and New South Wales.

Brazil is particularly in-terested in seed supplies of legumes and grasses for the improvement of pastures and forage crops.

Many of the pasture species developed by Australia, such as Townsville lucerne, originally came from South America. After selection and breeding in Australia some are now being exported back to the country of origin as improved pasture strains

### **NEW BOOKS ON PASTURES**

Two books on pasture plants have been published recently. Both were written by officers of the Division of Plant Industry.

"Pastoral Plants of the Riverine Plains" by Dr. J. H. Leigh and Mr. W. E. Mulham of the Riverina Laboratory has been published by the Jacaranda published

One third of Australia's sheep are raised in pastoral areas which receive less than 15'' to 17'' of rainfall. The Riverine plain alone supports some 18 million. Yet the plants available for grazing in these important areas have tended to receive far less attention than receive far 1 they deserve.

In their book, Dr. Leigh and Mr. Mulham deal with some 270 of the common grasses, herbs and small shrubs, likely to be found in the plain.

There are 120 illustrations in full colour, 100 line drawings and 50 illustrations in black and white half-tone.

"Australian Grasses-Volume One-Australian Capital Territory and Southern Tablelands of New South Wales" by Dr. Nancy T. Burbidge has been published by Angus and Robertson.

The book is intended for anyone interested in grasses, particularly for people on the land and those who want to identify the species, either native or introduced, that grow in the A.C.T. and surrounding districts districts

Dr. Burbidge begins by describing the structure of a grass plant and the method of identi-fying a seedhead. Character-istic species of various genera are then illustrated, grouped according to seedhead type.

The second part of the book The second part of the book contains plates showing these species in greater detail. These take the form of beautifully accurate and clear drawings and are accompanied by con-cise descriptive text designed to make identification easy and to provide information on in-cidence and grazing significance.



# This Month's News in Brief

### Doctorate

Mr. S. J. J. F. Davies of the Division of Wildlife Research has been awarded a Ph.D. by the University of Cambridge.

### **Fulbright Fellow**

Dr. P. S. Eagleson, Professor of Civil Engineering at the Massachusetts Institute of Technology, has arrived in Canberra to spend a nine month period with the Division of Land



Dr. P. S. EAGLESON

Research on a Fulbright Scholarship, Dr. Eagleson has specialized on the application of linear systems analysis to hydrology, and will work with the Division's hydrology group on the analysis and synthesis of hydrologic systems. Fulbright

Dr. J. Melville of the Execu-tive and Dr. C. G. Stephens, Head of the Pedology and Survey Section of the Division of Soils, have been made Fellows of the Australian Institute of Agricultural Science.

### Burglary

Fellows

The Division of Meteorological The Division of Meleorological Physics was burgled on the night of September 12th. Thieves forced a window and entered a number of labora-tories. Electronic gear worth about \$2,400 was stolen. Police are investigating.

### Erratum

The photographs of Dr. M. Shibaoka and Professor F. Yoshida were inadvertently ex-changed on the back page of last month's issue of "Coresearch"

### **Housing Finance**

The CSIRO No. 2 Co-operative The CSIRO No. 2 Co-operative Housing Society has a vacancy for a member of the staff who intends to build or buy a house within thirty miles of Mel-bourne within the next few months.

The maximum loan available is \$7,800 for a house on a made road, and \$7,200 for a house \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

> SAFETY NOT ES

### Switched Off But Dangerous

The following extract is taken from a letter which I received recently from an officer in one of our laboratories. received recently from an officer in one of our laboratories. "In our home we have the usual benches in the kitchen, behind which are tiles with electrical outlets (safety type) approximately 6" above the bench. For many years my wife has cleaned the benches and tiles (and apparently outlets) with a damp cloth. Yesterday, probably with a damper cloth and with other hand on stove she received a sufficient electric shock to fling her violently backwards. Note the outlet was switched off. I think it worth mention-ing the habit our electronics man has taught me, keep one hand in pocket or behind back and work with the other hand."

It's obvious from this that the switch must be on the neutral line leaving the active terminal in the socket continue the alice continually alive.

Although the wiring code of the Standards Association of Australia recommends that the switch be on the active line, this is not mandatory and many switches are wired line, this unsafely.

J. W. Hallam, Safety Officer, 



"We've just made a major discovery that will have a vital and far-reaching effect on the whole future of the project — it doesn't work." Courtesy "New Scientist".

on an unmade róad. As the Society has been established for a little more than five years, entrance costs would total about \$1,000. This amount may be paid in cash or deducted from the amount of the loan.

Any member of the staff who is interested should write to the Secretary of the Society, Mr. I. T. McIvor, 473 Bourke Street, Melbourne, for further information.

### 21st in Canberra

Friday, 21st October is the date for this year's Annual Ball held by the Canberra Divisions of CSIRO.

The Ball will be held at the

The Ball will be held at the Canberra Rex Hotel, and there will be two bands. The number of guests is limited to 250, and bookings have been very heavy. Some Divisions have already sold their quota of tickets. The Ball Committee has de-cided to continue on as a general CSIRO Social Com-mittee to organize functions on an inter-divisional basis.

There are now about 860 members of the CSIRO staff in Canberra.

Members of the CSRKO start In Canberra. Members of the Committee are Henry Ashley-Brown (Soils) Chairman; Tony Culnane (En-tomology) Treasurer; Jim Blan-don (Computing); Margot Anderson (Entomology); Pam Rumble (Plant Industry); Joseph Forshaw (Wildlife); Justin Murphy (Land Re-search); and Robert Rummery (Administrative Office).

### Thai Project

Dr. C. Wood of the Soil Mechanics Section left Aus-tralia last month to take up an appointment as leader of an Australian Colombo Plan team to work on the Chao Phys Research Project in Thailand This CSIRO-sponsored pro-This CSIRO-sponsored pro-ject will set up an experimental farm and laboratories at



Chainat, 150 miles north of Bangkok. Studies will be made Bangkok. Studies will be made of the problems associated with the growing of crops under irrigation during the dry season in the Central Plain of Thai-land. Aspects to be covered include ground water investi-gations, crop agronomy, soil fertility and irrigation water use. use

use. Mr. D. F. Beech, from the Division of Land Research, Kimberley Research Station, and Dr. P. J. Randall from the Division of Plant Industry, Canberra, are expected to join the team within the next six months.

### Sir Edward Lefroy

Sir Edward Lefroy, a well-known Western Australian pastoralist, died on September 9th at the age of 79. He had been associated with CSIRO and its predecessors for 36

and its predecessors for 36 years. Sir Edward joined the West-ern Australian State Committee in 1929 and resigned last year. He was appointed to the Coun-cil of CSIR in 1934, and was a member of the CSIRO Ad-visory Council until 1955.



Over the last nine months staff members of the Division of Animal Physiology's Ian Clunies Ross Animal Research Laboratory at Prospect have been busy during their lunch hours preparing a bowling green. Last month the Chief of the Division, Dr. I. W. McDonald, officially opened the Clunies Ross Bowling Club. Our picture shows Dr. McDonald bowling the first ball.

### Visits Overseas

**Dr. G. W. Arnold**, of the Division of Plant Industry left last month for Uruguay, where he will give a paper at a symposium on the determination of United States and the determination of the states will then visit Argentina, Bri-tain, and the Middle East, be-fore returning in December.

Dr. C. H. Burton, of the Division of Applied Physics, left last month for London. He will spend fifteen months at Queen Mary College, Uni-versity of London, studying the properties of dielectric materials. He will attend a symposium on micro-wave measurement in Budapest this month. month.

Dr. S. N. Fazekas de St. Groth, of the Division of Ani-mal Genetics, left last week for the United States. He will spend six weeks with the National Institutes of Health at Bethesda, Maryland, collab-orating in a study of the immune response of human be-ings to vaccination.

Dr. D. F. Martyn, Officer-in-Charge of the Upper Atmo-sphere Section, left last week for a short visit to Europe. He will attend a meeting of the Executive Committee of the International Council of Scien-tific Unions in Monaco from 6th to 9th October. He will

He was also a member of the Senate of the University of Western Australia and execu-tive officer to the famous W.A. Secession Movement of 1930-33.

### Ear-rings

The Food Preservation Film Society will screen "The Ear-rings of Madame De" starring Charles Boyer and Danielle Darrieux at 7.30 p.m. on Tues-day, 25th October, 1966. Dr. B. Chandler (telephone 88 0233) welcomes enquiries.

then fly to Madrid to attend a Congress of the International Academy of Astronautics.

Mr. R. G. Pearson, of the Division of Forest Products, has accepted an invitation to be Visiting Professor in Wood Mechanics and Rheology at the Department of Wood Science and Technology, North Caro-lina State University, Raleigh, N.C., U.S.A. He will be away for 12 months.

Mr. G. F. Reardon, of the Division of Forest Products, has been awarded a CSIRO Overseas Traineeship for 12 months to work as a research student under Professor S. K. Suddarth, Purdue University, Indiana, U.S.A. He will be engaged in studies of mathe-matical analyses of the be-haviour of timber structures with special reference to their rheological characteristics. rheological characteristics.

Dr. D. S. Taylor, of the Divi-sion of Textile Industry, left last week for the United States. He will spend three months at Cleveland, Ohio, and Lawrence, Mass., working with firms who hold licences to manufacture equipment invented by the Division.

Mr. R. A. Wallis, of the Division of Mechanical Engin-eering, leaves this month for Toronto, where he will give a paper to an international sym-posium on industrial aero-dynamics. He will visit re-search centres in Britain and South Africa before returning home early in December.

Mr. W. D. Woodhead, of the Division of Forest Products, will spend 12 months at the University of California, where he will study the insulating characteristics of wood-framed wall structures under a CSIRO studentship.

Dr. Margaret C. Anderson has joined the staff of the Pye Laboratory, Division of Plant Industry. Since graduating Ph.D. from Cambridge in 1963, she has been doing research at Newnham College under a



Dr. M. C. ANDERSON

D.S.I.R. Senior Research Fellowship. During 1964-65 Dr. Anderson spent some time with Plant Industry while holding a Royal Society and Nuffield Foundation Commonwealth Bursary.

Dr. G. F. Bennett has been appointed to the staff of the Division of Entomology, and will be stationed at Brisbane. A graduate of the University of Toronto, he has been with the Ontario Research Foundation since 1955. Dr. Bennett spent 1963-64 in Malavsia under the auspices of the U.S. National Institutes of Health. He sails for Australia later this month.

Mrs. M. A. Gan has joined the staff of the Division of Textile Physics, where she will study the mechanical properties of single fibres. Since her graduation from the University of New South Wales in 1962, she has been doing research on dyeing in the University's School of Textile Technology.

Mr. G. Holan has been appointed to the staff of the Division of Applied Chemistry. He has been with Monsanto Chemicals for the past fifteen years, originally as Trainee



Mr. G. HOLAN

Chemist, and later as Research Chemist, after gaining a diploma from the Royal Melbourne Institute of Technology. In 1961-62 Mr. Holan was posted to the Monsanto Research Centre at St. Louis, U.S.A.

Mr. K. M. Howes, who recently graduated from the University of London, has taken a temporary appointment with the Division of Plant Industry. He will be stationed at the Western Australian Regional Laboratory, where he will work with the Plant Introduction Section.

Mr. R. J. McIntyre has joined the staff of the Division of Mineral Chemistry, where g he will study chemical reacitions in electric discharges.



Since graduating from the University of Melbourne he has been metallurgist at the Williamstown Naval Dockyard.

Dr. D. A. D. Parry has been appointed to a research fellowship in the Division of Protein Chemistry, where he will use X-ray techniques to study protein structure. He has recently completed work for his Ph.D. degree at King's College, University of London.

Miss J. J. Percy has been appointed to the Parkville Laboratory of the Division of Animal Health, where she will work in the Virology Section.

Miss J. J. PERCY

A graduate of the University of Queensland, she has previously worked with the Red Cross Blood Transfusion Service and the brewing firm of Castlemaine Perkins Ltd.

Dr. A. R. Ramsden has been appointed to a Fellowship in the Division of Coal Research. After graduating in geology from Edinburgh in 1960, he



Dr. A. R. RAMSDEN

went to Durham under D.S.I.R. and N.A.T.O. scholarships. Since graduating Ph.D. in 1964 he has been at the University of Wisconsin, working on meteorites.

**Professor A. Sibatani** has accepted a fixed-term appointment in the Division of Animal Genetics. After graduating D.Sc. from Nagoya University he became a lecturer in biochemistry. He has held chairs at Yamaguchi Medical School and at Hiroshima University. In 1960-61 he was a Research Associate at the Rockefeller Institute, New York.

Dr. G. D. Thorburn has joined the staff of the Division of Animal Physiology, where he will study the role of the circulation on wool growth, thermo-regulation, reproduction and renal function. After graduating B.Sc.(Med.), M.B., B.S. in 1956 from Sydney, and completing hospital residencies,



Dr. G. D. THORBURN

he joined the staff of the Hallstrom Institute of Cardiology. His research has been conducted in the university departments of physiology at Sydney, Harvard and New South Wales.



In the Division of Food Preservation taste test laboratory panels of tasters assess the flavour, odour and texture of foods. Our picture shows Rowena Chapple preparing to taste peas.

# Making Gas From Coal

Dr. H. R. Linden, Director of the Institute of Gas Technology, Chicago, U.S.A., arrived in Australia last month. He is a guest of the Australian Gas Light Company, the Gas and Fuel Corporation of Victoria, and CSIRO.

Dr. Linden is a leading U.S. authority on the production and use of coal gas and natural gas. While in Australia he will advise on research programmes on gasification of coal and utilization of natural gas.

On 5th September Dr. Linden made a statement to the "Australian", mainly reporting on a very large programme in his Institute aimed at developing a hydrogen-gasification process for production from coal of a gas with high calorific value.

gas with high caloffic value. The principles of hydrogengasification of coal have been known for many years, but in spite of extensive research and development effort the process has not yet been brought into practical commercial use. The recent work done in Dr. Linden's Institute has made it possible to estimate costs of using the process under American conditions. Dr. Linden has plans to build, beginning next year, a prototype plant to operate the process, with support from the Office of Coal Research of the U.S. Department of the Interior. If Dr. Linden's cost estimates

ment of the Interior. If Dr. Linden's cost estimates are confirmed on the largerscale plant, then hydrogengasification of coal seems likely to be a useful method for meeting the rapidly increasing demands for gas in some areas in U.S.A.

This could happen first in places which are close to abundant coal supplies and a long distance from natural gas

sources not already being fully exploited.

In CSIRO, research on hydrogen-gasification of coal has been in progress since 1954 in the Division of Chemical Engineering. There has been a regular exchange of information with Dr. Linden's Institute to avoid duplication of effort.

Since establishment by the Commonwealth Government of the National Coal Research Advisory Committee, the CSIRO research on gasification has been carried on with the support of this committee.

The CSIRO research up to the present has mainly been concerned with the use of Victorian brown coal. Now that natural gas discoveries have been made in Victoria, it is planned to work in future on black coal gasification.

The Australian Coal Industry Research Laboratories will try to develop an economic process for production of the hydrogen used in the hydrogen-gasification processes.

The Australian research is still some way off the stage at which the commercial prospects of the process could be assessed with any reasonable accuracy under Australian conditions.

Dr. Linden's American cost studies suggest that coal gas might be produced in Australia by the hydrogen-gasification process much more cheaply than town gas produced by the more conventional methods now in industrial use.

But, the future of the process as a possible competitor with natural gas in Australia will depend—as in America—on a wide variety of technical and economic factors.

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# PROFESSOR UNDERWOOD JOINS EXECUTIVE

Professor E. J. Underwood, C.B.E., B.Sc., Ph.D., F.A.A., F.A.I.A.S., has been appointed a part-time member of the Executive. He replaces Dr. J. Melville, who retired from the Executive at the end of last month.

He has had a long association with CSIRO, having served as Chairman of the Western Aus-tralian State Committee and as member of the Advisory

Professor Underwood was born in London in 1905. After graduating in agricultural science with first-class honours from the University of Western Australia in 1928, he went to England where he obtained his Ph.D. degree from the Uni-versity of Cambridge in 1931. He ioined the Western Aus-

He joined the Western Aus-tralian Department of Agricul-ture in 1932 and soon obtained

world - wide recognition in scientific circles for his contri-bution to a number of animal

Council.

Professor Underwood is a pioneer of trace element re-search and one of the original discoverers of the significance of cobalt in the nutrition of sheep and cattle. He has also worked on botulism and preg-nancy toxaemia in sheep, fat hamb production, and sheep in-fertility on clover pastures. nutrition and husbandry problems.

In 1946 he was appointed Hackett Professor of Agricul-ture, Dean of the Faculty of Agriculture, and Director of the Institute of Agriculture at the University of Western Aus-tralia tralia.

tralia. Over the last 21 years he has been responsible for the organization and development of teaching in the Faculty of Agriculture and of research at the Institute of Agriculture. A feature of this development has been the support he has gained from the public and from industry.

Professor Underwood was elected Federal President of the Australian Institute of Agricul-tural Science in 1952 and in the same year was awarded the Institute's medal for outstand-ing contributions to agriculture. He became a Fallow of the

He became a Fellow of the Australian Academy of Science in 1954 and of the Australian Institute of Agricultural Science in 1958.



Professor E. J. UNDERWOOD

He was awarded the Kelvin medal of the Royal Society of Western Australia in 1959, and the Farrer Memorial Medal in 1966. In 1963 he was created C.B.E. Professor Underwood has re-presented Australia at a num-Dr. J. Melville has retired from the Executive after being a member for the last eight years. After a distinguished career in agricultural research in New Zealand Dr. Melville came to Australia in 1956 as Director of the Waite Agricultural Re-search Institute in Adelaide.

Professor Underwood has re-presented Australia at a num-ber of overseas conferences and has acted as an F.A.O. adviser to the Government of Nigeria-on agricultural planning and as an F.A.O. consultant on food and nutrition in the Caribbean.

Dr. J. MELVILLE

wisdom and his experience in the management of agricultural research to the deliberations of the Executive.

the Executive. Dr. Melville has also played a leading part in the activities of the Wool Research Pro-duction Advisory Committee where he has been instrumental in bringing together CSIRO end Uneverty events and in bringing to grower repre-sentatives a fuller understand-ing of the significance of scientific research.



Earlier this year A.B.C. Television produced two programmes Earner this year A.B.C. Television produced two programmes on astronomy. One of these is about the work of the Australian National University's observatory at Siding Spring. The second is about the radioastronomy observatory at Parkes. Our picture shows Dr. Peter Pockley (right) of the A.B.C. with members of the camera crew in the dish of the Parkes radiotelescope.

The programmes will be on the air in all capital cities this month. Times and dates are as follows. Exact times for Adelaide, Perth and Hobart are subject to confirmation.

|           | Siding Spring     | rarkes            |
|-----------|-------------------|-------------------|
| Melbourne | 8.30 p.m. Oct. 31 | 8.30 p.m. Nov. 7  |
| Sydney    | 8.55 p.m. Nov. 1  | 8.50 p.m. Nov. 8  |
| Brisbane  | 8.40 p.m. Nov. 1  | 8.30 p.m. Nov. 8  |
| Adelaide  | 8.30 p.m. Nov. 22 | 8.30 p.m. Nov. 29 |
| Perth     | 8.40 p.m. Nov. 22 | 8.40 p.m. Nov. 29 |
| Hobart    | 8.45 p.m. Nov. 22 | 8.45 p.m. Nov. 29 |

# **Credit Societies Lend \$1.2 million**

He was appointed to the Executive in 1958, During his period with CSIRO he has contributed his considerable

The latest annual reports of CSIRO's three credit societies reveal that in the last twelve years these societies have granted more than 5,000 loans totalling nearly \$3 million to their members.

At present the societies have more than \$1.2 million on loan.

Almost half of the members of CSIRO's staff belong to one of the societies.

of the societies. The credit society movement began in CSIRO in 1954 when a small group from the Sydney Regional Administrative Office and the National Standards and Radiophysics Laboratory met to consider forming a CSIRO small loans society.

As a result of the meeting the Laboratories Credit Union Co-operative Limited was established.

At the end of its first eighteen months of operation, the Union had 177 members and a capital of nearly \$20,000; today it has 653 members, a capital of

nearly \$249,000 and employs a

The Union will lend up to \$2,000. Membership is limited to CSIRO staff in New South Wales.

The activities of the Union in its early years created a good deal of interest throughin good deal of interest through-out the Organization and did much to stimulate the estab-lishment in 1957 of the CSIRO Co-operative Credit Society Limited which grants loans to CSIRO staff throughout Aus-tralia tralia.

The Credit Society has bene-fited greatly from the ex-perience of the Credit Union and the two societies maintain close contact with each other and co-operate closely.

Over the years the Credit Society's loan maximum has

been raised progressively from \$2,000 to \$6,000.

\$2,000 to \$0,000. The Society has now lent more than two million dollars; it has a capital of \$955,400 and a membership of 1,773.

A full time manager, Mr. J. Belkin, was appointed recently and the Society is now in a position to accept further deposits.

A third credit society, the Laboratories Co-operative Limited, was formed in Can-berra in 1959. The maximum amount that can be borrowed by a member is six hundred dollars, repayable over two vears. vears.

This amount may be raised, however, after an amendment to the A.C.T. Co-operative Societies Ordinance has come into effect.

|                              | Laboratories Credit<br>Union Co-operative<br>Ltd. (Sydney) | CSIRO Co-operative<br>Credit Society<br>Ltd. (Melbourne) | Laboratories<br>Co-operative Ltd.<br>(Canberra) |
|------------------------------|------------------------------------------------------------|----------------------------------------------------------|-------------------------------------------------|
| Year of formation            | 1954                                                       | 1957                                                     | 1959                                            |
| Total membership             | 653                                                        | 1,773                                                    | 228                                             |
| Total deposits               | \$248,824                                                  | \$955,400                                                | \$26,500                                        |
| Total loans outstanding      | \$240,062                                                  | \$974,600                                                | \$29,385                                        |
| Number of loans since forma- |                                                            | ,                                                        |                                                 |
| tion                         | 2.255                                                      | 2,332                                                    | 466                                             |
| Total loans made             | \$757,017                                                  | \$2,027,700                                              | \$176.000                                       |
| Effective rate of interest   |                                                            | <i>,,</i>                                                | \$170,000                                       |
| charged on loans             | 8%                                                         | 74%                                                      | 75%                                             |
| Rate of interest paid on de- |                                                            |                                                          |                                                 |
| novite for one year or more  | 6%                                                         | 6%                                                       | 6%                                              |
| Maximum amount of indi-      | 0,0                                                        | \$75                                                     | 0,0                                             |
| vidual loan                  | \$2,000                                                    | \$6,000                                                  | \$600                                           |
|                              | 1 2,000                                                    | \$0,000                                                  | - <b>3000</b>                                   |

# FUEL CELLS - BATTERIES THAT NEVER GO FLAT

On 20th March, 1800, an Italian physicist called Alessandro Volta announced his discovery of an electric battery. His invention aroused great interest throughout Europe, and in 1801 he demonstrated his "voltaic pile" before Napoleon. The Emperor was so impressed that he gave Volta a handsome gift of money, and offered a prize of 60,000 francs to encourage the study of electricity.

Soon the battery became a standard item of laboratory equipment. In an English lab-oratory an electric current was used to split water into hydro-gen and oxygen. Michael Faraday's experiments in the 1830's laid the foundations for the future electrochemical in-dustry. dustry. In 1839

In 1839 a young Englishman called William Robert Grove passed a current through water (containing a little sulphuric acid to make it conduct) and produced hydrogen and oxygen at the platinum electrodes.

When he turned off the cur-rent, he observed the process start to go backwards. Hydro-gen and oxygen at the elec-trodes began to disappear, while water was formed and a small electric current was generated generated.

Sintal electric current was generated. So Grove became the dis-coverer of the fuel cell, a device in which two fluids (in this case, gases) react together to produce an electric current. The discovery attracted some scientific interest and Grove was shortly afterwards elected to a Fellowship of the Royal Society. But the fuel cell seemed to have no more than academic interest. Grove turned from science to the law in his thirties, was admitted to the bar, and eventually became a Judge of the Common Pleas. Over a hundred years were to pass before his discovery was made use of.

made use of. Down through the years there were sporadic efforts to convert chemical energy dir-ectly into electrical energy. In 1896 an American called Jacques built a cell which, in effect, produced electricity direct from coal. Unfortunately it was far from economic, and only worked at a temperature of 500 degrees Centigrade. Modern development of fuel

Modern development of fuel Woldern development of rule cells began after the Second World War with the work of F. T. Bacon at Cambridge University. Bacon built a cell which worked on exactly the same principle as Grove's cell

A simple fuel cell element. Methyl alcohol and air, which are fed into it, react at the surface of a platinum electrode.

- it consumed hydrogen and

—it consumed hydrogen and oxygen and produced water and electric current. In 1959 he was able to demonstrate his cell operating a fork-lift truck. Bacon's demonstration ex-cited a great deal of industrial interest. Before long various types of experimental fuel cells were under development in the United States, Britain, Sweden, Switzerland and Germany.

Switzerland and Germany. In the United States General Electric and Pratt and Whitney have built fuel cells for use in the Gemini and Apollo manned space flight programs. Based on Grove's cell, they provide power for instruments and communications and drink-ing worke for astronauts ing water for astronauts.

ing water for astronauts. Allis-Chalmers has built a fuel cell powered tractor (now in the Smithsonian Institution) and a one-man submarine driven by fuel cells. The use of fuel cells in cars is under study, but there are formidable difficulties at the present level of technological development.

Recent research in Australia has suggested a field of appli-cation for fuel cells which may bring them into common use within the next few years.

within the next lew years. Fuel cell work in Australia was started in 1961 by the CSIRO Division of Mineral Chemistry with financial sup-port from the Reserve Bank of Australia. The Division was intrigued with the possibilities of the cell—the bank was worried about dependence on foreign oil supplies.

foreign oil supplies. By - 1962 - an - experimentalfuel cell had been built, inwhich was incorporated a newidea for making cheap andeffective platinum electrodes.Then the Division turned itsattention to methanol (methylalcohol) cells. Methyl alcoholis a fairly cheap fuel (obtainedas a refinery by-product). It isthe poisonous constituent ofmethylated spirits.methylated spirits,

methylated spirits. Methanol will combine with air in a platinum electrode fuel cell, to give electric power, water and carbon dioxide. But the trouble with these cells is that they only work for a few hours. Then the platinum elec-trodes become "poisoned" and the chemical reaction comes to a halt.



The experimental fuel cell in the centre of the picture is no bigger than a man's fist.

The CSIRO achievement of 1964-65 was to develop coat-ings of platinum combined with other materials which pre-vent the "poisoning" of the electrodes. This removes the main bar to practical develop-ment.

ment. Now CSIRO has contracted with the Australian Post Office to develop a fuel cell, with an output of 50 to 100 watts, which will run for 10,000 hours without attention. The project is scheduled for completion in 1967.

1967. The Post Office needs such power sources for its rapidly growing telecommunications network. The extension of the network over great distances has created a growing need for microwave repeater stations. These stations must often be

located far from conventional power sources, and trouble-free long-life power sources have to be provided for them. If CSIRO can come up with a suitable unit, it may well find world-wide application.

world-wide application. It is anyone's guess as to where fuel-cell technology will lead in the future. The cell has two great things in its favour. Firstly, it produces more elec-tricity per pound of fuel than any other non-nuclear method of power production. Secondly, it can run for months without maintenance. maintenance.

It may one day be used to power any device which can't easily be plugged into a power supply — space ship or auto-mobile, submarine or motor mower.

Some applications are here or almost here. Others must await many years of research and development for their practical realization.

# Parliament

The 1966/67 Estimates for CSIRO were debated in the House of Representatives on September 14th and 15th, and in the Senate on October 11th and 13th.

In the House of Representa-tives the debate on CSIRO was coupled with that on National Development and most speakers confined their remarks to that Department. As has been usual over recent years, both debates em-phasized the need for and im-portance of scientific research in a modern community, and the Organization's work in a number of fields was praised. Amongst the Organization's activities which were high-lighted were the work based on the Townsville laboratory of the Division of Tropical Pastures; studies by the Divi-sion of Wildlife Research and their significance in relation to the conservation of Australia's fauna; work on problems relat-ing to the coal industry and studies of prawn and tuna fisheries and Oceanography. Attention was also drawn to the value of the Organization's ublications in bringing the results of research to the atten-tion of both primary and secondary industry. Reference was also made to the increasing collaboration between the Or-ganization and State Depart-ments of Agriculture. Attention was drawn to the problem facing the government and the wool industry as a result of the depletion of the capital reserves which have, since the fund's establishment, been used to supplement the moneys made available for wool research by the govern-ment and the industry.

ment and the industry. Questions relating to the Government's administration of science were raised in both Houses. Members of the Op-position put forward proposals for the administration of science which in essence called for a single minister having responsibility for all aspects of science and technology and for a single science council to assist Parliament and ministers on these matters. on these matters.

In replying to these questions during the debate in the Senate, Senator Gorton referred to the fact that many countries were still gropping towards the best still groping towards the best method of organizing science, but that as yet no completely satisfactory answer to the prob-lem had been arrived at by any country.



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NOTES SAFETY

### A Squirt in Time

This week, or any other week, some-one in one of our laboratories will have a fire. In most cases it will be a small one, with no material damage done except to the nerves of the person concerned. In some cases it will be a more serious fire, causing severe damage to buildings or equipment.

equipment. If this happens to you, would you know where to find the nearest suitable extinguisher, and if so, how to use it? Check up on your laboratory techniques to avoid fires. but also make sure you know the Fire Instruction applying to your laboratory. There is no time to get this information after the fire has started.



# **News In Brief**

### H. G. Smith Medal

**Dr. D. E. Weiss** of the Divi-sion of Applied Chemistry has been awarded the H. G. Smith Memorial Medal for 1966 by the Royal Australian Chemical pretibute Institute.

### Street Names

A street in the new Canberra suburb of Pearce is to be named Julius Street, after Sir George Julius, first chairman of the C.S.I.R. Canberra al-ready has Clunies Ross and Rivett Streets.

### Swiss Scholarships

The Swiss Government will The Swiss Government will offer scholarships for Aus-tralian students to study in Switzerland commencing in October 1967. The Scholarships will be valid for one academic year but this period could be extended.

extended. The scholarships provide allowances ranging from S.Fr. 500 to 600 per month for most students and up to S.Fr.700 per month for post-graduate students. The allowances are sufficient to support a student without dependents. Students are exempted from lecture fees, receive a small book allowance and are insured against illness and accident. and accident.

Students pay their own fares from Australia to Switzerland but the return fare from Switzerland is paid by the Swiss Government.

Preference is given to post-graduate students who have a definite course of university study in mind. The maximum age for scholarship candidates is 35 years.

Application forms are avail-able from the Director, Com-monwealth Office of Education, P.O. Box 189, North Sydney.

C.S.C. Meeting

Mr. C. S. Christian of the Ex-ecutive and Mr. C. D. Kimpton of Head Office will leave shortly for Ghana where they will attend a meeting of the Commonwealth Scientific Com-mittee from November 14th to 27th.

The Committee, which com-prises the heads of research organizations of Common-wealth countries, meets every two years. The last meeting was in New Zealand.

was in New Zealand. Other delegates to the meet-ing in Ghana will include Mr. A. J. Vasey, formerly Tech-nical Secretary of the Division of Animal Health and now Executive Secretary of the C.S.C., and Mr. G. B. Gresford,

formerly Secretary of CSIRO and now Director of Science and Technology in the United Nations' Department of Eco-nomic and Social Affairs.

### Ornithology

Dr. D. L. Serventy, of the Division of Wildlife Research, has been invited to fill a vacancy on the permanent Executive Committee of the British Ornithological Conference.

### Studentships

A number of radical changes have been made in the CSIRO Studentship programme.

The changes, announced in recent circular, are of two main kinds.

Firstly, junior studentships (for the honours year) have been discontinued. All the studentships are for Ph.D. candidates or Ph.D. graduates wishing to gain overseas ex-perience. perience.

There will be 20 student-ships for study in Australia and 10 for study abroad.

The other new feature of the programme is a form of pre-ferential treatment for students who will work in certain specific fields which are of in-terest to CSIRO.

Eleven such fields have been listed for next year. The greater proportion of the awards will be made in these fields.

Living allowances for stu-dents in Australia have been increased, but the stipends for overseas studentships remain unchanged.

As in the past, studentship holders are not obliged to accept CSIRO appointments. Members of the CSIRO staff are eligible to apply for any category of studentship.

**Barbecue** 

A barbecue was held at the laboratories of the Soil Mechanics Section on Satur-day, 15th October to assist Miss CSIRO, Danielle Binzer, with her fund raising for the Miss Australia Quest. During the evening, the

During the evening, the Social Club Committee raised Social Club Committee raised \$140 from collections, spinning wheels and raffles. The total amount raised by Danielle and her sponsors has now passed the \$1,000 mark.

From left to right in the picture are Mr. N. Bain, Danielle Binzer, Mrs. G. Roberts and Mr. K. Wenham.

crash area.

The Section's second vehicle, a Land Rover, was positioned in Winton township to main-tain radio contact with per-sonnel at the crash area until D.C.A. established their own radio unit in Winton.

#### Home Loans

mation.

policy with the Society.

spect of such toans is to require a policy of basic assurance on the life of the applicant for a sum assured at least equal to the amount being borrowed, to be lodged with the Society as collateral security during the currency of the loan.

"Existing basic policies are accepted for this purpose, but temporary assurance policies such as the A.M.P.'s CSIRO Plan, are not acceptable."

Officers interested in taking advantage of the housing finance available from the A.M.P. Society should contact the Finance Manager, Mr. R. W. Viney at Head Office.



Above is a model of the \$200,000 marine aquarium and research laboratory to be built by the Western Australian Government for research on crayfish. The laboratory, which will be built at Waterman's Bay, nine miles north of Perth, will house a joint research team from the State Department of Fisheries and Fauna and the CSIRO Division of Fisheries and Oceanography. CSIRO will also contribute \$30,000 for basic laboratory equipment. The building has been designed by Perth architects Cameron, Chisholm and Nicol. Tenders are expected to be called early next year.

### At the Scene Of the Crash

Three members of the Soil Mechanics Section, G. J. Ren-frey, N. D. Bain and K. T. Wenham were on duty in Win-ton, Queensland, at the time of the recent Ansett-ANA Vis-count crash. They assisted the Winton Police and Winton Shire Council officers at the crash area.

crash area. They set up and operated the Section's International sup-ply truck as operational head-quarters at the crash scene until D.C.A. investigation officers were able to establish their own facilities. The truck, which is used for field work in Northern Australia, was equipped to supply radio; water, refrigeration, tables and lights to the rescue authorities. The Section's second vehicle.

There have been several en-quiries recently regarding the requirements by the A.M.P. Society for collateral Life Poli-cies for Housing Loans to CSIRO staff. Mr. Judd, the Society's Representative, has supplied the following infor-metion

"Membership of the CSIRO Life Assurance Plan, auto-matically makes a member eligible to apply for a loan under the Society's Home Pur-chase Plan, even though he has no other basic life assurance policy with the Society.

"This of course does not mean that a loan will auto-matically be granted as this will depend on the proposition sub-nitted. However, special con-sideration is extended to mem-bers of CSIRO in regard to Home Purchase Loans.

"The present practice in re-spect of such loans is to require

### POSITIONS VACANT

The following vacancies for professional appointments are current:

- The following vacancies for professional appointments are current: RISEARCH SCIENTIST (RS) Division of Chemical Physics 52/15 (11/11/66) RESEARCH SCIENTIST (RS) FELLOWSHIP IN SURFACE CHEMISTRY Division of Tribophysics 370/183 (11/11/66) RESEARCH SCIENTIST (RS) SURFACE CHEMISTRY Division of Tribophysics 370/182 (11/11/66) RESEARCH SCIENTIST (RS)(RS) FELLOWSHIP IN METAL PHYSICS Division of Tribophysics 370/183 (11/11/66) RESEARCH SCIENTIST (RS)(RS) FELLOWSHIP IN METAL PHYSICS Division of Animal Physiology 343/373 (11/11/66) RESEARCH SCIENTIST (RS)(RS) Division of Enhomology 18/377 (11/11/66) RESEARCH SCIENTIST (RS)(RS) Division of Enhomology 19/377 (11/11/66) RESEARCH SCIENTIST (RS)(RS) Division of Chemoslogy 19/377 (11/11/66) RESEARCH SCIENTIST (RS)(RS) Division of Tropical Pastures 239/288 (41/166) SCIENTIFIC SERVICES OFFICER (E0/12) SOIL MICROBIOLOGIST Division of Bailding Research 39/353 (41/11/66) ENGINHER (ENG. 1/2) HLECTRONIC ENGINEER Division of Plant Industry 130/899 (18/11/66) ENGINHER (ENG. 1/2) HLECTRONIC ENGINEER Division of Plant Industry = 130/899 (18/11/66) ENGINHER (ENG. 1/2) HLECTRONIC ENGINEER Division of Plant Industry = 130/899 (18/11/66) RESEARCH SCIENTIST (RS/SRS) POSTDOCTORAL FELLOW-SHIP IN PLANT OFFICER (E0/12) CLOUD PHYSICS Division of Plant Industry 130/689 (18/11/66) RESEARCH SCIENTIST (RS/SRS) DOSTDOCTORAL FELLOW-SHIP IN PLANT (RS/SRS) DOSID MECHANICS Section 92075 (25/11/266) RESEARCH SCIENTIST (RS/SRS) DOSID MECHANICS Section 92075 (15/12/66) RESEARCH SCIENTIST (RS/SRS) DOSID MECHANICS Section 92075



Representatives of all the Canberra divisions attended a fare-well party for Mrs. D. I. Chisholm on 29th September. Mrs. Chisholm, who looked after travelling arrangements in Can-berra, has moved to Perth with her husband, who has been appointed W.A. manager for the A.B.C. At the farewell party she was presented with a wristlet watch and a handbag. With Mrs. Chisholm in the picture are Dr. D. J. Goodchild (Plant Industry), Dr. W. T. Williams (Computing) and Mr. K. J. Prowse (Regional Administrative Officer).



Mr. M. R. Anthony has been appointed to the staff of the Ore-Dressing Investigations Section, where he will study the chemistry of circuit liquors in flotation plants. Since graduating from the University of Auckland in 1961 he has been on the staff of Kraft Foods Ltd.

Dr. E. Bianchi arrived in Melbourne last month to join the staff of the Division of Applied Chemistry. He took out his doctorate from the University of Rome in 1938 and continued research in organic chemistry in Italy until 1946, when he held a Fellowship at Princeton.



Dr. E. BIANCHI

He then spent twelve years teaching chemistry at the Catholic University of Santiago, Chile. More recently Dr. Bianchi has been working at Stanford University, the U.S. National Institutes of Health, and the University of Arizona.

Mr. A. L. V. Cook has been appointed to the staff of the Computing Research Section, and will be stationed in Melbourne. He has been working



Mr. A. L. V. COOK

with computers for several years at the Department of Supply's Aeronautical Research Laboratories. Mr. Cook has qualified in recent years for an R.M.I.T. diploma and a Melbourne University degree by part-time study.

Mr. R. N. Cross has joined the staff of the Industrial and Physical Sciences Branch of Head Office. After graduating



Mr. R. N. CROSS from the University of Melbourne in 1961 he joined Monsanto Chemicals Ltd., where he has been a patent officer in the company's research department.

Mr. D. B. Coates has been appointed Officer-in-Charge of the Division of Tropical Pastures' Narayen Research Station, near Munduberra, Queensland. Since graduating with first-class honours from the University of New England in 1963 he has been agricultural overseer at Camboon Station, which is in the same region.

Miss Sheila M. Davies, a graduate in arts and commerce from the University of Melbourne, has been appointed librarian at the Division of Tribophysics. She has previously worked in various Commonwealth Department libraries, including the library of the Defence Standards Laboratories in Melbourne.

Dr. J. Ferguson has joined the staff of the Division of Applied Physics. After graduating Ph.D. from Sydney in 1955 he spent two years in Ottawa under an N.R.C. post-



Dr. J. FERGUSON

doctoral fellowship. He then spent two years at the University of British Columbia before joining CSIRO's Division of Chemical Physics. Since 1961 Dr. Ferguson has been on the research staff of the Bell Telephone Laboratories Inc.

Mr. P. Ferrar arrives this week to join the staff of the Division of Entomology, where he will study the ecology of dung-breeding insects. En route to Australia he has been visiting various research institutions in Africa. Mr. Ferrar recently graduated M.Sc. from the University of Cambridge.

Dr. B. S. Fletcher has joined the staff of the Division of Entomology, and sails for Australia next week. He will work with the Division's Fruit Fly Investigations Unit in Sydney. Dr. Fletcher was recently awarded the Ph.D. degree of the University of Birmingham.

**Dr. M. N. Galbraith** has arrived in Australia to take up an appointment in the Division of Applied Chemistry. After graduating Ph.D. from the University of Sydney in 1964 he went to Britain, where he has held a Glaxo Fellowship in the Department of Pharmaceutical Chemistry, University of London.



Dr. F. R. Hartley has been appointed to a post-doctoral fellowship in the Division of Protein Chemistry, where he will study chromium and zirconium complexes of proteins. He recently completed requirements for the D.Phil. degree at Oxford University.

Dr. J. S. Hawker has joined the staff of the Horticultural Research Section and will be stationed in Adelaide. After gradualing Ph.D. from Adelaide in 1962 he held a postdoctoral fellowship for a year at the University of California, Los Angeles. Since then, he has been at the Colonial Sugar Refining Company's David North Plant Research Centre in Brisbane.

**Dr. Beity Klepper**, an American citizen, has accepted a post-doctoral fellowship at the Irrigation Research Laboratory, Griffith. After graduating summa cum laude from Vanderbilt University in 1958 she spent a year in Britain at the University of Exeter under a Marshall Scholarship. Since 1961 she has been at Duke University, North Carolina.

Dr. G. R. Millward will arrive this week from Britain to take up a post-doctoral fellowship in electron microscopy at the Division of Protein Chemistry. He has just completed work for the Ph.D. degree of the University of Leeds.

Dr. G. I. Moss has been appointed to the staff of the Irrigation Research Laboratory, Griffith, and will embark from Britain next week. After graduating from Nottingham University in 1963 he proceeded to Birmingham, where he has just completed requirements for his Ph.D.



This sunflower, over six feet high, was used at the opening of the Pye Laboratory in a demonstration of the tensiometer, an instrument developed by the laboratory staff for measuring the energy with which water is held in the soil. Looking after the sunflower is Christine Burkovic of the Division of Plant Industry. She is less than six feet high.

Dr. J. B. Passioura has joined the staff of the Division of Land Research, and will be stationed in Canberra. After graduating Ph.D. from Mel-



Dr. J. B. PASSIOURA bourne in 1963 he spent a year at the Macauley Institute, Aberdeen, under a CSIRO Studentship, Since then he has been at the Agricultural University of Wageningen, Holland.

Mr. R. F. Reeve has been appointed to the staff of the Division of Food Preservation. He will join the team at Lucas Heights studying the effect of ionizing radiations on certain foods. Since gaining a diploma from Perth Technical College in 1964, he has been on the staff of the W.A. Institute of Agriculture.



Mr. k. F. KEEVE Mr. L. J. Stephens has joined the staff of the Division of Protein Chemistry. A diplomate of the Royal Melbourne



Mr. L. J. STEPHENS

Institute of Technology, he has been for seven years with Monsanto Chemicals, working in the field of polymer chemistry.

D. T. E. Treffry has been re-appointed to the staff of the Division of Plant Industry, where he will work on chloroplast biochemistry. He was previously with the Division



Dr. T. E. TREFFRY from 1960 until 1962, when he left to go to the University of Chicago. Since graduating Ph.D. there, he has been working in the botany department of the Hebrew University at Jerusalem.

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# BRITANNICA AWARD OF \$10,000 TO DR. A. WALSH

Dr. A. Walsh, Assistant Chief of the Division of Chemical Physics, has won the 1966 Britannica Australia award for science. The award consists of a gold medal, a citation, and \$10,000.

The award recognizes Dr. Walsh's unique contributions to spectroscopy through his development of atomic absorption methods and apparatus.

Atomic absorption was first discovered in 1802 as the dark lines in the spectrum of the sun. Fraunhofer independently rediscovered these lines with more careful observations in 1814 and listed 576 of them. He reasoned that the Fraun-hofer "D" line was due to an atmosphere of sodium in the sun's manite. sun's mantle.

There the matter rested. The the pursuit of emission spectro-scopy which, until 1952, was the only form normally used.

Atomic absorption lay dormant for 138 years.

dormant for 138 years. In 1952 Dr. Walsh became convinced that there were many advantages to be gained from atomic absorption, rather than emission spectroscopy.

For one thing the theoretical gain in sensitivity was a thousand-fold or more, and it promised to be simpler in the long run than conventional spectral analysis.

spectral analysis. Perhaps a number of people had thought this way before and had been daunted by the instrumental requirements but Walsh was not. Sources of atomic resonance radiation lines — narrow but intense — were needed. The then con-ventional answer was a hollow-cathode lamp, backed by an entire rack of gas handling and punping gear. Not very con-

venient, as a different lamp would be required for each element.\_\_\_\_

element. The first experiments were rushed through in 1952 on sodium as a test case, using the sodium D line. These ex-periments were completely suc-cessful, and the first patents were taken out in 1953, though the initial paper did not appear until 1955.



Dr. A. WALSH

Dr. A. WALSH The public premiere of the method was at the Institute of Physics Exhibition of Scien-ific Instruments in March, 1954, in Melbourne, where the exhibit of a prototype ap-paratus was virtually ignored. The idea was treated as a scientific toy, evoking knowing smiles and scepticism. Mis-applications of well established physical principles were used to back up arguments as to why it would not work. It says a lot for the basic

It says a lot for the basic faith in the idea held by Alan Walsh and his Section Leader, Dr. Lloyd Rees, that they re-

mained unshaken in the face of such criticism.

of such criticism. The problem of hollow-cathode lamps was difficult but overcome by persistent work. The result was a sealed-off, compact lamp which has a use-ful lifetime as great as that of a radio valve. These lamps have become standard equip-ment for spectroscopers need-ing sources of characteristic radiation, and are made essen-tially to the CSIRO pattern in meny countries.

Many countries. A big break-through came in 1963 when a new kind of high-intensity lamp was devised with over 100 times the light in-tensity of the previous genera-tion of lamps. These enabled sensitivities of 0.01 parts per million to become common-place. Signs of slowing down and

Signs of slowing down of the pace of development are diffi-cult to detect. Last year the "resonance monochromator" emerged, which in some appli-cations entirely does away with the need for a spectrometer and uses the fact that any particular type of atom is best suited to detect radiation from its kindred, but ignores radia-tion eminating from others. This dramatically simple new instrument is going to have an enormous impact. "Even a chemist can't put it out of adjustment," as Walsh says. It was assessed with elo-quence by a representative of Signs of slowing down of the

says. It was assessed with elo-quence by a representative of an overseas company manufac-turing atomic absorption gear, present at the lecture where it was made public, when he blurted out "Darnn you Walsh . . . you've made all our apparatus obsolete".

The Australian Pugwash Committee is arranging a Regional Conference on the theme: "Scientific, Technical and Industrial Development in South-East Asia", to be held at International House, University of Melbourne, from 23rd to 27th January, 1967.

Scientists and other scholars will attend from Ceylon, India, Indonesia, Japan, Malaysia, New Zealand, Pakistan, Singa-pore, the United Nations and

pore, the United Nations and possibly other countries. Professor J. Rotblat, Secre-tary-General of the Pugwash Continuing Committee, will come from England for the Conference, and other partici-

It is hard to dream up a situation in which atomic ab-sorption is not used today. The applications cover an enormous range . . trace ele-ments in soils, calcium and potassitum in blood, corrosion in canned foods, the propor-tion of metals in alloys, a diagnostic tool of wear in disel railway engines, copper and lead in wine, prospecting for minerals. It is hard to dream up a for minerals.

From slow beginnings an avalanche has started, There are an estimated 3,000 atomic absorption spectrometers at work in the world today, of which about 1,500 were made this year.

Australian firms have gained a large slice of the market, and export over 60 per cent. of production, which last year amounted to over \$1,000,000. Ten firms are currently pro-dusing comparison

ducing apparatus. Walsh's work is typified by a directness, even apparent naivety, which is characteristic of atomic absorption. In 1950 he invented the multiple pass monochromator, on which CSIRO took out patents which have earned royalties of about \$100,000 for the Treasury from the incorporation of the idea in commercial instru-ments.

He was elected to the Aus-tralian Academy of Science in 1958, and he is currently President-elect of the Aus-tralian Institute of Physics.

pants include Professor M. S. Thacker, Member of the Indian Planning Commission.

**Pugwash Conference** 

Planning Commission. Observers will be nominated by the Director-General for Science and Technology, United Nations (Mr. G. B. Gresford), and the Secretary of the Department of External Affairs (Sir James Plimsoll). Sir Frederick White will present a statement on CSIRO's contributions to development in South-East Asia. Dr. W. Boas, Chief of the

in South-East Asia. Dr. W. Boas, Chief of the Division of Tribophysics, Sir Otto Frankel, Research Fellow in the Division of Plant In-dustry, and Dr. D. F. Martyn, Officer-in-Charge of the Upper Atmosphere Section, are all members of the sponsoring panel. Dr. H. G. Higgins, of the Division of Forest Pro-ducts, is Chairman of the Committee. Full attendance at the Con-

ducts, is Chairman of the Committee. Full attendance at the Con-ference is necessarily limited, to avoid swamping the over-seas participants with Aus-tralian opinion. In order to provide an opportunity for interested scientists and others to meet the visitors, an extended meeting has been arranged for Tuesday, 24th January, at 8.00 p.m. in the North Building, University of Melbourne. Supper will be provided and all are welcome. It is intended to arrange other social func-tions at which a wider circle of scientists and academics will be able to get to know the Asian visitors. Enquiries regarding the Con-ference, the functions, or visitors' itineraries should be directed to Dr. Higgins, at the Division of Forest Products. Enquiries from Sydney could be addressed to Dr. K. T. Fowler, Department of Medi-cine, University of Sydney, and from Canberra to Dr. E. K. Inall, Research School of Physical Sciences, A.N.U. Inall, Research School Physical Sciences, A.N.U.



Mr. Walter Maler, the divisional draftsman at Building Research, comes from Southern Germany, For some years he has been seuding back to his relatives in Germany tapes bearing commentaries on various aspects of life in Australia. These tapes have been used in high schools in Germany for general educational purposes, and Mr. Maier has been approached by the Department of Immigration to produce more of them to cover a range of subjects, including science in Australia, Our picture shows Mr. Maler (right foreground) recording a discussion with migrant research workers (left to right) Mr. Ignis Sasnalits, from Lithuania, Mr. Ben Kroone, from Holland, Mr. Theo Gelb, from Poland, and Mr. Julius Beretka from Hungary.

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# SAFETY NOTES

### **Private Bombs**

2 DEC 1966

You don't see so many pieces in the newspapers about mines washed ashore or unexploded bombs being found on heaches now the war has been over twenty years, and a good thing, too.

But it makes it even more alarming to learn that we may be laying a few peacetime bombs of our own in the sand.

About these compressed-air cylinders that underwater swimmers use. They corrode internally in time and should be tested every two years. And they should never be left to lie in the direct heat of the sun.

What can happen when one gets hot was demonstrated in England when some were left in the back of a car on a hot day. One exploded violently, just about wrecking the car. A fragment went through the top, travelled 200 yards in the air and plummeted through the roof of the ambulance station.

Fortunately, there was no need to answer this "call" as o one had been about, but imagine if it had been a no one had be crowded beach!

crowded beach! And those of you who think, "It can't happen to me now that I've even cut out paddling", should remember those aerosols that jet everything from shaving cream to suntan totom to the spear. Leave one of those under the rear wind without a provide the set of those under the rear wind without a provide the set of those when the sun thinks, and you might have a private bomb as well. J. W. Hallam, Safety Officer.

# ADVISORY COUNCIL MEETS IN CANBERRA

The Advisory Council met in Canberra on 8th and 9th November. The meeting was held in Becker Hall, the main auditorium of the Australian Academy of Science.

Meals were taken in the adjoining Fellows' Room in which was set up the Exhibition recently staged in King's Hall, Parliament House.

Topics discussed at the Coun for the minerals industry; the countries of the minerals industry; the cattle tick; the phytotron, and wool research. Sir Frederick White addressed the Council on the subject of science and government.

#### The Cattle Tick

The Cattle HICK Dr. R. H. Wharton, of the Division of Entomology, spoke about current research on the cattle tick.

While the control of the cattle tick was based on chemicals, he said, we could expect recurring crises because of the ability of the tick to develop resistance.

The development of tick-resistant cattle offered the most promising long-term solution to the problem.

The standard of tick control on well-managed properties was much better today than it was before the introduction of modern synthetic chemicals.

It is the almost complete de-pendence of the cattle industry on these chemicals and the ability of the tick to develop resistance to each new chemical used against it that causes periodic crises.

Stringent quarantine and intensive dipping contain out-breaks of resistant ticks to some extent, giving time for tests of new acaricides against these tick strains.

But past evidence suggests that the parasite eventually will become resistant to whatever chemical is used.

Dr. Wharton told the meet-ing that the cattle tick affected some seven million cattle and half a million square miles of northern Australia.

northern Australia. Whereas small numbers of ticks had little effect, loss of blood and the irritation of heavy infestations caused loss of condition and milk produc-tion and could lead to death. Experiments had shown that the daily presence of 100 ticks led to an annual reduction of at least 100 pounds in weight gain per beast. gain per beast.

Animals in poor condition and on poor pastures pro-duced more ticks and were less able to stand the blood loss.

Control methods have control methods have changed very little over the past 50 years. Chemicals, in the form of dips, spray races and hand sprays, have formed the basis of control.

Their use has been strengthened recently by planned dipping in the spring (to prevent the build-up of large summer populations) and systematic pasture spelling to break the ticks' life cycle.

Both strategic dipping and pasture spelling could be more widely used with considerable advantage, although the latter can't be applied to many large properties.

Tick-resistance in cattle is apparently highly heritable and select breeding for this character is possible.

character is possible. The development of resist-ance in herds is necessarily a slow process. Much research is required to find out how resistance operates, how ro-sistant cattle can be recognised and introduced into herds and what effect this would have on the problem of tick fever.

CSIRO research has in-cluded studies on the mode of action of acaricides and mechanisms of resistance in ticks. A greater understanding of the biochemical processes of the parasite is also needed.

Even though reports are not encouraging biological control agents should be sought, par-ticularly in Asia, the original home of the ticks.

### Wool Research

Wool Kesearch Dr. J. Melville, Director of the Waite Agricultural Re-search Institute, spoke on wool research. He was Chairman of the Australian Wool Industry Conference until his retirement earlier this year.

He took as his subject: "The profitability of wool research in Australia over the past 35 years.'

The annual dividend from The annual dividend from Australia's investment in wool research probably equalled the total cost of the research over the past 40 years, said Dr. Melville.

Australian wool production had increased by about 700 million pounds per annum in the past 15 years, an increase at present prices worth more than \$300 million per annum.

A surprisingly static wool clip over the 20 years from 1930 to 1950 had been fol-lowed by a steady clip increase over the next 15 years up to the present time.

A measure of just how fairly A measure of just how fairly that increase has been won is given by the year just past. 1965-6 was one of the most serious drought years in Aus-tralia's history. Yet at over 1,600 million pounds the clip was more than 600 million pounds above the 1930-50 average.

Dr. Melville emphasized that it was not possible to obtain an accurate accounting in monetary terms but that an assessment in broad terms was a valuable exercise,

Pasture research stood high on the credit side of the re-search ledger. Professor Colin Donald, in his Farmer Mem-orial Lecture in 1964, con-cluded that each additional acre of improved pasture had meant an increase of 1.6 sheep in the proional Gock in the national flock.

In the national flock. Professor Donald had also concluded that 48 per cent. of the wool production increment was a direct consequence of pasture improvement. And 48 per cent. of \$300 million was a handsome dividend on the money spent on pasture re-search.

Professor Donald had also Professor Donald had also referred to the development of nitrogen in improved pastures as a valuable additional bonus. He had estimated that, on a conservative basis, nitrogen added to Australian soils from 1935 to 1960 through the use of pasture legumes would have cost the Australian farmer \$3,200 million if he had needed to buy it as sulphate of ammonia or as urea. The added nitrogen had

The added nitrogen had played an important part in the rapidly increasing cereal yields of the country.

On this season's crop and at present prices, the increased value was certainly in excess of \$100 million.

Speaking of pest control as another important production factor, Dr. Melville referred to research on the rabbit, lucerne flea, red legged earthmite, locusts, grasshoppers and pasture grubs.



Research on pests and diseases not already present in Australia, only a small effort at the present time, was main-tained as an important safe-guard against the introduction of such disastrous viruses as blue tongue and foot and mouth disease.

This expenditure was not reflected directly in increased production but, like fire in-surance, was the policy of the prudent organization.

### The Phytotron

Dr. John Falk, Chief of the Division of Plant Industry, spoke about the research value of the phytotron.

He said that CERES, Can-berra's controlled environment research laboratory, brought together a more varied group of scientists concerned with a greater variety of climatic re-gions than any of the other half dozen phytotrons in the world world.

More than 100 different plant species had been investi-gated in CERES last year and 59 scientific papers had been published as a result of re-search in the phytotron since it was opened in 1963.

it was opened in 1963. The phytotron had been used by microbiologists, nutrition-ists, physiologists, agronomists, ecologists, geneticists and plant breeders from the CSIRO Division of Plant Industry and also by more than fifty visit-ing scientists. Fifteen visitors had come from overseas coun-tries in 1965 alone.

One of the most interesting fields of work in the phyto-tron was a study of plant response to day length, particu-larly in the control of flower-ing ing.

Ĭť has been found that a at has been found that a special light receptor in plants senses day length. Changing its structure as a result of the illumination, this receptor sends a message to points of growth in the plant. growth in the plant.

In an experiment on a plant in CERES it was determined that this message moves at the rate of about one inch per hour.

Increases in nucleic acid and protein synthesis were detected in a few special target cells at the growing point when the message arrived.

Dr. Falk went on to speak of other aspects of plant re-sponse to light,

Some rice varieties would flower, or not flower, depend-ing upon an additional five minutes of day length.

Exposure of certain plants to strong light for a few seconds in the middle of a long night could be sufficient for the plant to record it as a long day.

Phytotron research had rethe temperature response of temperate and sub-tropical grasses.

grasses. The temperate grasses all showed a similar growth rate of about 17 per cent. per day at an optimum temperature of about 70°F. On the other hand, growth rates of sub-tropical species often exceeded 40 per cent. per day, increas-ing with temperature all the way up to 113°F.

The striking fact was the great conservatism of these plant types and the absence so far of intermediates between them.

A typical piece of work, carried out in collaboration

Engaged in discussion at the Advisory Council were, from left, Mr. A. F. Gurnett-Smith (Secretary, Agricultural and Biological Services), Mr. V. G. Burley (Chairman, Tasmanian State Committee), and Dr. J. E. Falk (Chief of the Division of Plant Industry). Part of the exhibition can be seen in the background.

with the N.S.W. Department of Agriculture, had been a study of sterility in the flowers of rice, a defect which resulted in the head not filling with grain. Experiments had shown that the cause was low night tem-peratures during formation of the flowering head.

Varieties not so sensitive to low night temperatures were being incorporated in a cross-ing programme, the progeny of which would in turn be tested in the phytotron.

### POSITIONS VACANT

The following vacancies for professional appointments are current.

RESEARCH SCIENTIST (RS/SRS) - Division of Plant

Industry – 130/812 (13/1/67). EXPERIMENTAL OFFICER (EO2/3) – SURVEY METHODOLOGY – Division of Land Research –

METHODOLOGY – Division of Land Research – 618/204 (16/12/66). SCIENTIFIC SERVICES OFFICER (SSO2/3) – Agri-cultural Liaison Unit – 117/100 (2/12/66). RESEARCH SCIENTIST (RS/SRS) – PLANT ECOLO-GIST – (WATER RELATIONS) – Division of Plant Industry – 130/813 (30/12/66). RESEARCH SCIENTIST (RS/SRS) – Division of Chemical Physics – 582/17 (16/1/67). EXPERIMENTAL OFFICER (EO1/2) – PHYSICIST/ ENGINEER (CELL PHYSIOLOGY INVESTIGATIONS) – Division of Land Research – 618/201 (16/12/66). RESEARCH SCIENTIST (RS/SRS) – Division of Chemical Physics – 582/17 (16/1/67). RESEARCH SCIENTIST (RS/SRS) – Division of Chemical Physics – 582/17 (16/1/67). RESEARCH SCIENTIST (RS/SRS) – CHEMIST – Division of Mineral Chemistry – 601/50 (16/1/67). SCIENTIFIC SERVICES OFFICER (SSO2/3) – DATA PROCESSING – S011 Mechanics Section – 920/76 (9/12/66).

(5)/12/60. EXPERIMENTAL OFFICER (E01/2) — CHEMIST/ BIOCHEMIST — Division of Protein Chemistry — 462/273

IIG/12/66.
 EXPERIMENTAL OFFICER (EO1/2) — CHEMIST — Division of Applied Chemistry — 586/33 (16/12/66).
 RESEARCH SCIENTIST (RS/SRS/PRS) — SYSTEMS ECOLOGIST — Division of Plant Industry — 130/807 (23/12/66).
 EXPERIMENTAL OFFICER (EO1/2) — Division of Dairy Research — 410/169 (9/12/66).
 RESEARCH SCIENTIST (RS/SRS/PRS) — MASS SPECTROSCOPIST — Division of Entomology — 180/382 (16/12/66).

(16/12/66). RESEARCH SCIENTIST (RS/SRS) — INSECT ECOLO-GIST — Division of Entomology — 180/384 (16/12/66). EXPERIMENTAL OFFICER (EO1/2) — ASTRO-NOMICAL OBSERVER — Division of Physics — 770/337

EXPERIMENTAL OFFICER (E01/2) — CHEMIST — Division of Mineral Chemistry — 601/48 (9/12/66).

### Fifty Years of Research for the Mineral Industry

On this fiftieth Anniversary of the establishment of the Advisory Council of Science and Industry, it is appropriate to recall that four of the first nine Bulletins published by the Council dealt with subjects which concerned the mineral industry.

Regrettably this early enthusiasm was short-lived, but it is interesting to speculate on the advances which might have occurred had the programme of mineral research been maintained.

maintained. In September, 1916, the American Institute of Mining Engineers met in Arizonn to discuss, for the first time in that Institute's history, the sub-ject of Flotation. Large-scale flotation had only come to the U.S.A. in 1912, although G. D. Delprat, the General Manager of Broken Hill Pty. Co., had given Australia its first suc-cessful flotation plant in 1902. cessiu holarion plant in 1992. Despite Australia's ten-year start it was the Americans, at their 1916 Conference, who laid the research foundation on which the industry's ad-

Summary of Mr. Ivan Newn-ham's talk to the Advisory Council last month.

vances of the next decade were built. What might have hap-pened in Australia had a budding Wark or Sutherland beer encouraged by the Ad-visory Council to capitalise on the wide experience in flotation practice which our own country possessed at that time? time?

time? The question is possibly answered by two classic examples of research and de-velopment which occurred in the mineral industry, during, the five-year regime of the Advisory Council of Science and Industry. In 1916, only twelve months after the intro-duction of the first commercial electrolytic zinc plant in Mon-tana, H. W. Gepp established the foundation on which was built the Electrolytic Zinc Company of Australasia. In 1919 a minerals research

In 1919 a minerals research laboratory was set up in South Melbourne where, one year later, G. K. Williams com-menced his epic studies on the development and application of the coreliumour lead refining

development and application of the continuous lead refining process. Starting with a funda-mental study of the lead-silver-zinc ternary phase diagram this project concluded in 1932 with the erection at Port Pirie of the world's first continuous lead refining plant. Unfortunately, neither the first Council nor its two suc-cessors — the Institute of Science and Industry and the Council for Scientific and In-dustrial Research—showed any significant interest in this type of work, and it was not until 1934 that the Commonwealth Government encouraged miner-Government encouraged miner-al research by granting CSIR £5,000 per year for five years to study the recovery of gold.

55,000 per year for hve years to study the recovery of gold. During the 1940's the tradi-tions of mineral research in CSIRO were established by Dr. I. W. Wark, who vigor-ously campaigned for a pro-gramme of fundamental re-search supported by practical plant tests whenever possible. He was strongly supported by R. G. Thomas, who was keen to see Australian miner-als treated in Australia, and who was particularly attrac-ted by the potential of the east ccast mineral sands. In the first staff talk to be given to Dr Wark's new Division of Industrial Chemistry in 1941, Mr. Thomas misquoted Lewis Carroll to show that the latter had also been interested in the utilisation of beach sands.\*

In the fiscal year 1935/36 CSIR expenditure on mineral investigations (excluding fuels) jumped to 2.4 per cent. of the total finance available, but the average annual growth rate of this figure over the succeeding thirty years has been a mere 130 parts per million, giving an expenditure in 1965/66 of 2.8 per cent. Admittedly this percentage now remesents \$900,000. but

Admittedly this percentage now represents \$900,000, but even this amount of Treasury support is somewhat over-shadowed by the estimated \$5 million which the mineral in-dustry itself will spend on its own research and development programmes in 196 programmes in 1966.

programmes in 1966. During the past twenty-five years there has developed be-tween CSIRO and the Aus-tralian mineral industry a growing bond of collaboration which has perceptibly in-fluenced the Organization's research programme; concur-rently the mining companies have evidenced an increased willingness to contribute gener-

withingness to contribute gener-ously to pilot-plant develop-mental costs. Many of these larger-scale operations are dependent on the successful solution of prob-lems arising from inadequate

or untested materials of con-struction, and this is a field of study which is of growing significance to the mineral re-search worker. The chemist or metallurgist with a new process, no matter how brilliantly conceived his ideas may be, is not going to make a vital contribution to the mineral industry unless his laboratory work can be demon-strated in "hardware". This restriction may place

strated in "hardware". This restriction may place him at the mercy of the material scientist or the en-gineer, and his ultimate suc-cess may be dependent as much on his desire to col-laborate as on his ability to iunovate. innovate.

In 1916 the Australian mineral industry was endowed with practical skills which were inadequately supported by fundamental studies; in 1966 there is no dearth of fun-damental knowledge but there is a significant weakness in industry's ability to capitalise on the ideas spawned by the research worker. Fifty years ago the Ad-visory Council failed to bridge the gap; it is our responsi-bility to ensure that history does not repeat itself.

'The Walrus and the Carpenter were walking hand in hand, They wept like anything to see such quantities of sand. 'If this were sent to U.S.A.,' they said, 'it would be grand!'

'If seven maids with seven mops swept it for half a year, Do you suppose,' the Walrus said, 'that they could get it clear?' 'I doubi it,' said the Carpenter, 'we'd better treat it here!' ''



News

Dr. A. COSTIN



Courtesy "London Punch"

### in Brief Vice-Chancellor

Vice-Chancellor Emeritus Professor G. M. Badger, who resigned from the Executive earlier this year, has been appointed Vice-Chancel-lor of the University of Ade-laide. He will take over the post from Sir Henry Basten in March, 1967.

### Departure

Mr. D. T. C. Gillespie, of the Head Office Secretariat, left the service of the Organiza-tion last month.

#### Chairman

Mr. F. Penman, of Head Office, has been elected Chair-man of the Australian National Commitse of the International Commission on Irrigation and Draiwage Drainage.

### Translators

The Public Service Arbitrator has determined new salary rates for translators, effective from 17th February, 1966. Increases range from \$260 per annum at the first step of Translator Grade 1 up to \$726 at the top step of Grade 3.

### Married Women

Married women in CSIRO will Married women in CSIRO will henceforth be given perman-ent status. Single girls will no longer be obliged to resign when they are married, and re-apply for their old jobs. This was determined by the Executive at its meeting on November 21st. The decision followed an amendment to the Public Service Act which made a similar change in conditions of employment in the Public Service. Service



On Thursday, October 20th, some 100 members and ex-members of the staff of the Division of Forest Products farewelléd two refiring members of the Division's maintenance team. They are Messrs. Alf Moroney ( $26\frac{1}{2}$  years' service) and Gordon Madden (20 years' service).

The function, organized by Maintenance Section, was held at the New Lincoln Inn, Carlton,

Above: Mr. R. Muncey, Chief of the Division, is about to present a large surprise packet to Alf Moroney. Below: Bob Hall hands Gordon Madden (right) his one-eyed football barracker's spectacles.



# **Overseas Visits**

Mr. P. A. Taylor, of the Division of Mechanical Engineering. leaves next week for ain, Canada and the Britain, Canada and the United States. He will visit a number of agricultural engineering research institutions,

### New Film

**New Film** The David Rivett Laboratory of the Division of Chemical Physics in Clayton, Victoria, was officially opened by the Minister, Senator Gorton, on April 1st of this year. The filmed record of this opening has since been edited into a 22-minute, 16 mm., colour sound film, which may be of interest to CSIRO staff. The film can be borrowed

The film can be borrowed from the Film Librarian at Head Office.

#### Broadcast

BroadCast Dr. W. T. Williams, of the Cemputing Research Section, will speak on "Scientific prob-lems in the life and work of Mr. Sherlock Holmes" on Sun-day, 4th December, 1966, at 10.30 a.m. The talk will be broadcast by A.B.C. radio in the "Insight" series.

and spend three months work-ing at the University of Newcastle-upon-Tyne.

Dr J. S. Hosking and Mr. E. Tauber, of the Division of Building Research, left last week for Colombo. They will spend three months in Ceylon advising on the development of advising on the development of the local brick and tile industry. After this assignment, Dr. Hosking will visit institutions in Bangkok, Kuala Lumpur and Singapore before returning home. Mr. Tauber will proceed to Europe, where he will investigate ceramic tech-nology in U.S.S.R., France, nology in U.S.S Britain and Israel.

Mr. I. Langlands, Chief of the Division of Building Re-search, left last week for Bangkok. He is attending a meet-ing of the U.N. Consultative Group for Promoting Co-ordinated Industrial Research in Asia and the Far East from In Asia and the Far East from December 1st-8th. He will then spend a few days with the Applied Scientific Research Corporation of Thailand.

Dr. A. J. Bruce arrives next week from Britain to take up a post with the Division of Fisheries and Oceanography. He will lead a team studying several species of prawns. Dr. Bruce has degrees in science and medicine from London University. He has been en-gaged in research on crustacea for the past ten years in Hong Kong, Zanzibar and Kenya. Dr. R. H. Groves has been

**Dr. R. H. Groves** has been appointed to the staff of the Division of Plant Industry, where he will study the ecology



Dr. R. H. GROVES

of skeleton weed. After grad-uating Ph.D. from the Uni-versity of Melbourne he went to the California Institute of Technology in 1964 under a Technology in 1964 under a National Science Foundation Fellowship. For the past year he has held a fellowship at Michigan State University.



Dr. D. W. HOLLOMON

Dr. D. W. Hollomon has arrived in Canberra to join the Division of Plant Industry, where he will study spore germination in Blue Mould. A graduate of the Universities of Reading and Hull, he has been



Dr. N. ISHIKURA

at Winnipeg for the past year on a Canadian National Re-search Council post-doctoral fellowship. Dr. N. Ishikura has accepted

Dr. N. Ishikura has accepted a research fellowship at the Division of Forest Products, where he will work on poly-phenolic extractives and exu-dates of wood. Since graduat-ing Ph.D. from Tokyo Kyoiku University in 1965, he has held a post-doctoral fellowship of the Japan Society for the Pro-motion of Science.



Dr. R. H. Leicester has joined the staff of the Division of Forest Breather joined the staff of the Division of Forest Products. Since graduating B.E. and M.Sc. from the University of Western Australia ho has worked as a structural design engineer and as a lecturer in engineering. Since 1963 he has been work-ing for his Ph.D. at the Uni-versity of Illinois.

# LAUNCHED 1,000 CHIPS



Miss CSIRO (Danielle Binzer) was, we find, not the only CSIRO rel entered in the Miss Australia Quest. Rozanne Collier bove), a stenographer at the Irrigation Research Station, rifith, was another. Rozanne raised over \$1,000 in the Miss estern Riverina division of the Quest, and won a nine-day trip girl entered (above), Griffith, Western to the Gold Coast.



This year's Rugby League "grudge match" between two CSIRO teams, the Sydney "Rabbitohs" and the Canberra "All Colours" resulted in a 13-5 win for Canberra. The home side took the Cox Shield which had been held for the last year by Sydney. Last year the "Rabbitohs" had a 13-6 win.

The Canberra (cam (above) was: Back row: Dennis O'Keefe, John Knox, Frank McGuren, Greg Moore, Ross Thomas, A. Williams (Ref.). Front row: Bob Barrett, Frank Graham, Len Abbey, Otto Hilhorst, John Feehan, Bill Dominguez.

The Sydney team (below) was: Back row: Lindsay Owen, Chris Filan, Bill Silenc, Butch Hare, Kevin Carr, Greg Simewell, Bruce Anderson, Don Mayhew. Front row: Mark Filan, Alan Hawes, Peter Starr, Geoff Naughton.



# Visitors From Abroad

Brewen, of the J. G. Dr. Biology Division, Oak Ridge National Laboratory, U.S.A., is spending a year at the Canberra laboratories of the Division of Plant Industry. He is



Dr. J. G. BREWEN

collaborating in research on replication of chromosomes, crossing over, and chromo-somal recombination.

Professor R. A. Brink, Pro-fessor of Genetics in the University of Wisconsin, is spend-



Professor R. A. BRINK

ing six months with the Division of Plant Industry. He Foundation Senior Post-doc-toral Fellowship. Professor Brink's research interest is in

chromosome organization.

Mr. Kango Miyazaki, Chief of the Hemicellulose Labora-tory at the Government Forest Experiment Station at Meguro, Tokyo, arrived in Australia in October. He will spend a year at the Division of Forest Products working on the structure of acidic hemicelluloses.



Dr. M. H. Slabber, Chief of the Winter Rainfall Section, South African Department of Agricultural Technical Services, is spending six weeks in Australia. He has visited a number of CSIRO Groups, including the Western Australian Regional Laboratory, the Divisions of Soils and Tropical Pastures and the Animal Physiology group at Armidale.