CORESEARCH

FOR CIRCULATION AMONG MEMBERS OF CSIRO STAFF — NUMBER 70, MELBOURNE, JANUARY 1965

OPENING AT GRIFFITH

A warning that CSIRO was a long way behind scratch in buildings and was only catching up very slowly was given by Dr. I. W. Wark of the Executive last November at the opening of the new £70,000 wing to the Irrigation Research Laboratory at Griffith.

Dr. Wark told a crowd of more than three hundred guests, who had assembled to see the Governor-General, Lord De Lisle, open the new building, that he would like to see more people in high places take an interest in research and visit such laboratories.

He said that irrigation research was of very great importance in Australia and CSIRO had tried to push forward with vigor in the development of the laboratory at Griffith.

CSIRO operated a business undertaking for the people of Australia and it could not get very far without the interest and support of the people.

They would not get a better idea anywhere in Australia of the way in which people could help further research.

He said that the Murrumbidgee Irrigation Area had developed a system of co-operation in research whereby State and Federal Officers, farmers and industry came together regularly to plan an attack on the problems of irrigation.

He commended this kind of co-operation to further the research programme of the nation.

In opening the new wing, the Governor-General said that the close co-operation between science and the users of science formed the basis of success of CSIRO.

Australian agriculture, using scientific know-how, was already feeding more people with less manpower. This was a trend which would have to be accentuated in the years ahead.

It was imperative that Australian agriculturalists maintained and increased their high output per man.

"The scientist must help the farmer and grazier to achieve greater efficiency in future through the application of science and technology," he said.

Nowhere in Australia was this teamwork between scientist and farmer more in evidence than on the Murrumbidgee Irrigation Area, and the intensive production of many forms of agriculture was striking evidence of this.

Mr. E. R. Hoare, Officer-in-Charge of the Irrigation Research Laboratory, said the diversion of the Snowy Waters and the completion of the new Blowering Dam would mean that the present Murrumbidgee Irrigation Area would be doubled and Australia's irrigated acreage would rise by fifty per cent.

After opening the new wing Lord De Lisle was taken on a conducted tour of the building.

Above: Watched by Dr. I. W. Wark, Lord De Lisle examines the gold key with which he opened the new laboratory.

The problems of the M.I.A. were common to Pakistan, Southern Russia, India and California and so the work of the laboratory attracted attention in many parts of the world. Regular visitors came from Asia, Africa, Europe and the Americas.

The hard work and achievements of the people of the M.I.A. had proved an inspiration to the band of young scientists engaged in irrigation research at Griffith.

Doctorates

Mr. F. K. Ball, of the Division of Meteorological Physics, has been awarded the degree of Doctor of Science by the University of Melbourne on the basis of his published work in meteorological and geophysical fluid dynamics.

Mr. D. S. Roberts, of the Division of Animal Health, has been awarded the degree of Doctor of Philosophy by London University. His thesis was concerned with the pathogenesis of mycotic dermatitis in sheep.

Meeting in New Zealand

Australia was represented at the third meeting of the British Commonwealth Scientific Committee, which was held in New Zealand last November, by the Chairman, Sir Frederick White, Lord Casey, and the Secretary, Mr. G. B. Gresford.

The Committee, which comprises the heads of research organizations of Commonwealth countries, meets every two years to discuss problems of scientific collaboration within the Commonwealth.

The last B.C.S.C. meeting was held in New Delhi in 1962.

At the invitation of the New Zealand Department of Scientific and Industrial Research, most delegates toured both the North and South Islands to see places of scientific and general interest.

The executive meetings were held at Massey University near Palmerston North on 23rd and 24th November, during which a long agenda was satisfactorily discussed.

Eleven Commonwealth countries were represented, but Pakistan, Ceylon, Tanganyika and Zanzibar, Sierra Leone, and Trinidad and Tobago found themselves unable to be represented.

Dr. W. M. Hamilton, Director-General of D.S.I.R., took the Chair and Sir Robert Jackson, Consultant to the United Nations Special Fund, attended by invitation as an observer.

The Executive Secretary of the Committee, Mr. A. J. Vasey, reported on his visits to Commonwealth countries in Africa and the West Indies and his impressions and advice were greatly welcomed.

In 1965 Mr. Vasey will complete his visits to Commonwealth countries by visits to Asia.

The Australian delegation played its part in the discussion of the agenda as a whole.

It proposed two resolutions of consequence that were accepted — that science should be included in the matters to be dealt with in the prospective Commonwealth Secretariat, arising from the last Prime Ministers' Conference — and that the name "British" should be omitted from the description of the British Commonwealth Scientific Committee.

Sir Robert Jackson described the proposed rationalisation of the work of the United Nations Special Fund and that of the United Nations Expanded Programme of Technical Assistance.

He made the point that the difficulty of finding adequate experienced professional personnel was an important problem distinct from that of finding the necessary money for developmental projects.

Apart from the value of the discussions and the exchange of views, the Conference proved cerned with scientific matters useful in enabling those con- in the Commonwealth countries to get to know each other on a personal basis.

On the invitation of the Government of Ghana, the Committee decided to hold its next meeting in Ghana in 1966.

FIELD DAY AT MERBEIN

A crowd of some two hundred and fifty growers attended a field day at the Horticultural Research Section's field station at Merbein last month.

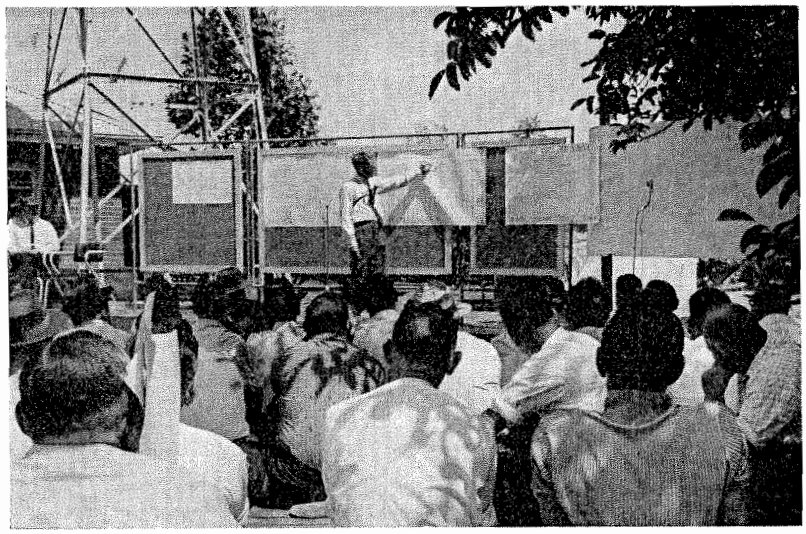
The field day was organized by the Victorian Department of Agriculture in conjunction with the Merbein Dried Fruit Growers' Union.

In his address of welcome, the Officer-in-Charge of the Section, Dr. J. V. Possingham, spoke of the work of the station and of the progress that had been made since the Section was established a little over two years ago.

Other speakers included Mr. A. J. Antcliff (Selecting better sultana vines), Mr. M. R. Sauer (Nematodes), Dr. F. Radler (Problems of drying and processing grapes), Mr. D. H. Maggs (Analysis of fruit tree performance), Mr. D. Alexander (Zinc deficiency in sultanas), and Mr. G. H. Kerridge (Production of undipped sultanas).

After the lectures, growers were shown a series of displays of the research work going on at the Station.

Below: Mr. Antcliff outlines to growers some of the principles of vine selection.



APPOINTMENTS VACANT

The following vacancies for professional appointments are current:—

RESEARCH SCIENTIST (RS/SRS) — Division of Textile Industry (464/348) (15/1/65).

RESEARCH SCIENTIST (RS/SRS) — Division of Plant Industry (130/672) (15/1/65).

EXPERIMENTAL OFFICER (EO 1/2) — Division of Textile Physics (465/230) (8/1/65).

RESEARCH SCIENTIST (RS/SRS) — Division of Tropical Pastures (850/222) (22/1/65).

EXPERIMENTAL OFFICER (VETERINARY PARASITOLOGIST) (EO 1/2) — Division of Animal Health (201/244) (22/2/65).

SENIOR RESEARCH SCIENTIST (SRS/PRS) — Division of Mathematical Statistics (440/165) (22/1/65).

EXPERIMENTAL OFFICER (EO 1/2) — Division of Animal Health (201/243) (15/1/65).

CHILDREN'S CHRISTMAS PARTIES

Throughout CSIRO last month everyone celebrated Christmas and practically every Division had its children's party.

Left top. Melbourne T.V. personality Happy Hammond was a big hit at the children's party at Highett, where the Divisions of Building Research, Dairy Research and Mechanical Engineering combined forces to help entertain some two hundred and thirty-five children.

Left centre. Patricia Goss did not know quite how to react to Father Christmas at the Head Office Christmas party. Father Christmas was played by Jack Bourne for the twelfth successive year. Twenty-five children from the Antonian Institute, Richmond, joined with more than ninety children of Head Office staff in the celebrations.

Left bottom. Mr. Slappo kept a large audience enthralled with his conjuring tricks at the Head Office party.

Right top. Horse rides were one of the big attractions at the Division of Wildlife Research party at Gungahlin.

Right bottom. At the Wildlife party, Christopher Sullivan keeps his automatic rifle handy just in case anyone has designs on his Christmas cake.

News In Brief

Officer-in-Charge

Dr. M. Mulcahy of the Division of Soils has been appointed Officer-in-Charge of the Western Australian Regional Laboratory following the decision of Dr. R. C. Rossiter to relinquish this position in order to devote more time to his research programme.

New Guinea Posting

Mr. N. G. Brown, of the Division of Building Research, left last month for Papua and New Guinea where he will spend eleven weeks looking after the Division's Port Moresby office while Mr. J. R. Barned returns to Australia on leave.

Botanist For New Caledonia

Dr. H. S. McKee ended a twenty-four year association with CSIRO last month when he resigned from the Plant Introduction Section of the Division of Plant Industry to take up an appointment in New Caledonia.

Dr. McKee will collect and study native flora for the Centre National de Recherche Scientifique. He was in New Caledonia from 1954 to 1956 on loan to the South Pacific Commission.

Directory

A directory of scientific and technical research centres in Australia has just been published. The directory, which was prepared by Miss B. South and Mrs. M. Bridges of the Head Office Library, contains some three hundred and fifty-three entries.

Station To Close

The Division of Plant Industry's Maradango experiment station in the Canberra suburb of Downer will be closed shortly and subdivided for housing. The station once covered six hundred acres.

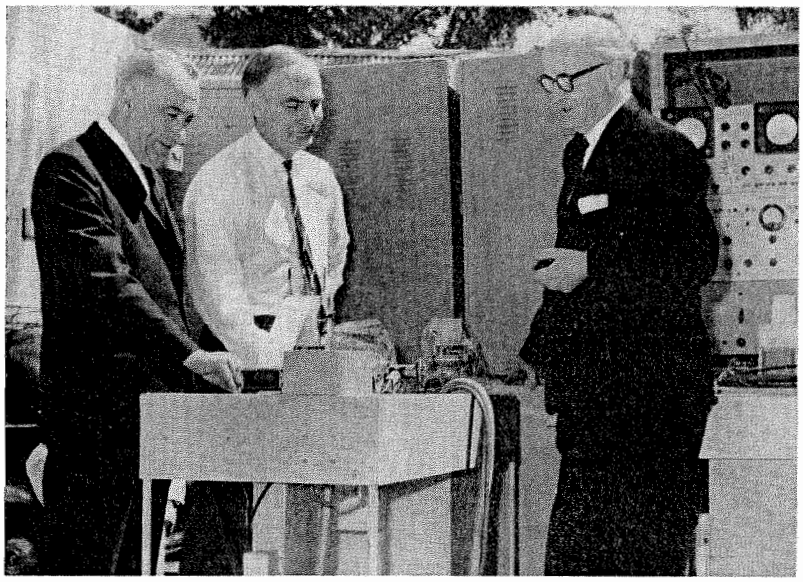
With the expansion of Canberra's northern suburbs most of the experimental work has been transferred to Ginninderra. The station will close down as soon as the current experiments are completed.

Second Time Lucky

Laboratory craftsmen, Mr. W. J. Rafferty and Mr. C. Ellis, of the Division of Plant Industry, won first and second prizes in a Melbourne Cup sweep last November and decided to invest the proceeds in the N.S.W. State Lottery.

Their ticket, "First and Second Syndicate", romped home with second prize of £1,000.

Asked if they might re-invest the win for a third try at fortune, Mr. Rafferty was quite firm. "Not on your life," he said, "Lightning never strikes twice in the same place."



Courtesy "The Australian"

COMPUTER COMES - COMPUTER GOES

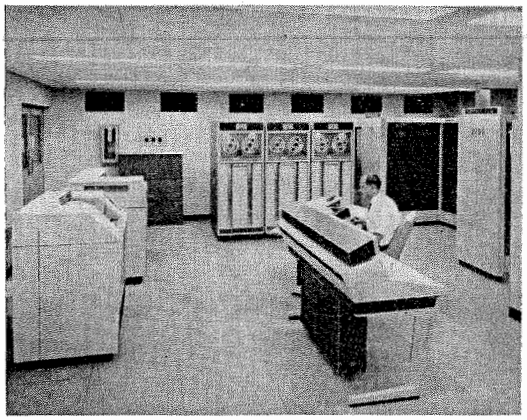
While engineers were busy in Melbourne recently installing the Organization's new Control Data 3200 computer, arrangements were being made to retire CSIRAC, believed to be one of the oldest digital computers in the world.

CSIRAC was designed and constructed by the Division of Radiophysics in the immediate post-war years and was used by CSIRO and other research organizations.

In 1956 it was transferred to the Applied Mathematics Department of the University of Melbourne.

Under a joint arrangement between the University and CSIRO, CSIRAC formed the integral part of a mathematical computing centre for the solution of mathematical problems of university departments, government scientific organizations, and other scientific groups, and provided facilities for teaching and for investigating mathematical aspects of high speed computing techniques.

With the recent acquisition by Melbourne University of a modern digital computer, and with the completion of the Organization's computer network, CSIRAC has been retired and is now being moved to the Institute of Applied Science in Melbourne where it will be on display when the National Gallery moves into the new Cultural Centre in 1967.



Above. In front of CSIRAC are Mr. J. C. Liddy of the Institute of Applied Science, Dr. F. Hirst of the Computation Department at Melbourne University and Mr. R. H. Fowler of the Institute.

Left. The new computer installation at Clayton, Melbourne. Our picture shows the central processor (right); three magnetic tape units; card reader (upper left); line printer (lower left); and control console and typewriter (centre foreground).

Courtesy "The Australian"

One of the two twin-engined Cessna 310's belonging to the Division of Radiophysics and used in rain-making experiments has been fitted with a new type of experimental silver iodide burner which is designed to disperse a greater quantity of silver iodide smoke. The silver iodide-acetone solution is carried in a tank in the fuselage and is pumped to burners under the wings where it is ignited by spark plugs, producing large numbers of ice-forming nuclei.

VISITORS FROM OVERSEAS

Sir Gordon Cox, Secretary of the Agricultural Research Council of the United Kingdom, visited Australia last month following his attendance at the B.C.S.C. Meeting in New Zealand. While in Australia he visited the Divisions of Dairy Research, Plant Industry, Land Research and Regional Survey, Biochemistry and General Nutrition, Soils, Animal Physiology, and Food Preservation.

Professor V. T. Stannett, Associate Director of the Research Triangle Institute of Durham, North Carolina, spent ten days in Australia recently. He visited the Divisions of Forest Products, Protein Chemistry and Textile Industry as well as a number of industrial laboratories. Professor

Professor V. T. STANNETT

Stannett is a world authority on radiation grafting of polymers to wool and cellulose.

Mr. K. A. Quagraine, Head of the Soil Research Unit of the Ghana Academy of Sciences, visited Australia last month on the way home from the B.C.S.C. Meeting. Mr. Quagraine had discussions at Head Office on technical aid to Ghana and visited the Divisions of Tropical Pastures and Land Research and Regional Survey.

Mr. R. G. W. Willcocks, Technical Director of the Jamaican Scientific Research Council, visited Australia last month following his attendance at the B.C.S.C. Meeting. Mr. Willcocks visited the Chemical Research Laboratories and Head Office.

Professor W. T. Williams, Head of the Department of Botany at Southampton University, will arrive in Australia later this month on a seven week visit. Professor Williams, who is a leading expert in the application of statistical and numerical methods to association analysis, classification problems and general taxonomic procedures, has been invited by the Computing Research Section. During his stay he will be based in Canberra, but he will also visit Adelaide, Melbourne, Sydney, Brisbane, Griffith and Perth, where he will give a series of seminars and have discussions with interested individuals.

Professor E. M. Sparrow, Professor of Mechanical Engineering at the University of Minnesota, will return home early this month after spending seven weeks working at the Division of Mechanical Engineering. Professor Sparrow is a leading authority on heat and mass transfer.

Professor J. A. Duffie, Director of the Solar Energy Laboratory and Assistant Director of the Engineering Research Laboratory at the University of Wisconsin has just finished a seven week working visit to the Division of Mechanical Engineering. Professor Duffie's main field of work has been direct conversion of solar to electrical energy by thermo-electric devices; however, he is now extending his interests to solar air conditioning.

Both Professor Sparrow and Professor Duffie contributed papers to the Applied Thermodynamics Conference which was arranged by the Institution of Engineers and held in Melbourne last month. They also took part in a number of symposia which were held at the Division.

Below. Professor E. M. Sparrow and Professor J. A. Duffie with the Chief of the Division of Mechanical Engineering, Mr. R. N. Morse.

Overseas Visits

Dr. L. H. P. Jones, of the Division of Plant Industry, will leave Australia for the U.S.A. shortly, where he will spend eleven months at the Soil Plant Nutrition Laboratory, Ithaca, New York. At the end of the year, Dr. Jones will spend six weeks visiting research institutes in the United Kingdom and Europe and will return to Australia in February next year.

Dr. P. W. Michael, of the Division of Plant Industry, will leave Australia later this month for Japan to accept a Japanese Government Science Fellowship. Dr. Michael will work at the Department of Physiology and Genetics, National Institute of Agricultural Science, University of Agriculture and Forestry, Tokyo. Dr. Michael will return to Australia via the Philippines next November.

Dr. W. E. Savige, of the Division of Protein Chemistry, left last month for Italy where he will spend five months with Professor A. Fava at the Institute de Chimica Fisica, University di Perugia. Next June, Dr. Savige will attend the 3rd International Wool Textile Research Conference in Paris, and from there will travel to the U.S.A., where he will work with Professor A. D. McLaren at the University of California for six months.

Film Societies Want Members

The Food Preservation Film Society, Sydney, and the Forest Products Film Society, Melbourne, have vacancies for new members.

Membership is open to all CSIRO staff in Sydney and Melbourne.

The Food Preservation Film Society screens film classics on the fourth Tuesday evening of each month in the E. W. Hicks Memorial Hall in the grounds of the Division of Food Preservation at North Ryde.

Some of the films shown recently include "Genevieve", "The Vampire", "The Cranes are Flying", "The Importance of Being Earnest", "Diary of a Country Priest", and "Stagecoach".

Annual subscriptions are £1 single and £1/15/- double. Further information may be obtained from Mr. R. Elbourne or Miss H. Hicks (telephone 88 0233).

The Forest Products Film Society meets at approximately monthly intervals in the Division's theatrette at Yarra Bank Road, South Melbourne.

Among the films shown recently are "I'm All Right, Jack", "Eroica", "Confessions of Felix Krull", "A Raisin in the Sun", "Out of Reach of the Devil", and "A Kind of Loving".

This year's programme will include films from the Netherlands, France, Britain and U.S.A.

Society members can obtain preferential booking for the 1965 Melbourne Film Festival.

Annual subscriptions are £1/10/- for full and associate members and £1 for family members.

Further information may be obtained from Mr. H. F. A. Hergt or Mr. A. J. Watson (telephone 69 5831).

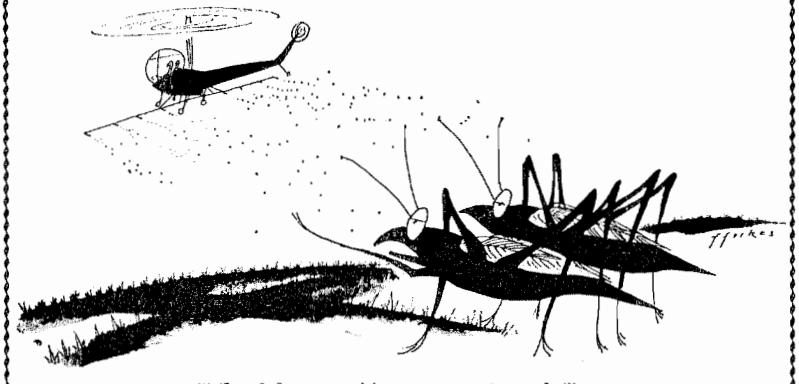
LECTURER

Dr. J. H. Palmer, of the Irrigation Research Laboratory, has been appointed senior lecturer in plant physiology at the University of New South Wales. Dr. Palmer, a graduate of Sheffield University, came to Griffith in 1960 from Jamaica, where he was a lecturer at the University of the West Indies.

CHARITY FUND

Last year, staff of the Division of Forest Products gave five donations of £50 together with twelve donations ranging from £5 to £20 to a number of charities, particularly those which do not receive wide publicity or support.

The donations were made through the Division's Staff Charity Fund which now has some one hundred and forty regular contributors who give a total of £12 a fortnight. Since 1959, the Division has given more than £1,800 to charity.



"Thank heavens, it's not a new formula!"

SILENT SPRING - COMMENT BY PUNCH

"This is the dog that bit the cat that killed the rat that ate the malt that came from the grain that Jack sprayed."

APPOINTMENTS TO STAFF

Dr. S. A. Laurie has been appointed to a Post Doctoral Fellowship with the Division of Protein Chemistry where he will work on the reaction of proteins with metals, with particular reference to keratin and collagen. Dr. Laurie graduated B.Sc. from the University of Wales in 1959, and obtained his Ph.D. from the same University in 1962. His Ph.D. thesis was entitled "studies

Dr. S. A. LAURIE

with radio-tracers of ion-association by a solubility method and solvolysis of the chloropentammine cobalt (III) ion". Since 1962 he has been a Research Associate at the Washington State University where he has undertaken research on the exchange of oxygen-18 between water and the trisperiodatocobaltate (III) ion, and on the solubility of tetraphenylarsonium periodate in aqueous solution.

Dr. P. G. Jarvis has been appointed to a twelve month research fellowship with the climatology section of the Division of Land Research and Regional Survey where he will work on plant-water relationships, with particular reference to seedling growth and development. Dr. Jarvis graduated B.A. from the University of Oxford in 1957 and Ph.D. from the University of Sheffield in 1961. His Ph. D. thesis was entitled "Factors affecting the growth and regeneration of *Quercus petraea* in the Sheffield region". From 1960 to 1962, Dr. Jarvis held a NATO Research Fellowship at the Institute of Physiological Botany of the University of Uppsala in Sweden. His work on comparative studies in plant water relations resulted in the award of the degree of Fil. Dr. from Uppsala University in 1963. For the latter half of 1963, Dr. Jarvis was a research assistant in the Department of Forest Ecology of the Royal College of Forestry at Stockholm, and since then he has been Assistant Professor of Plant Physiology at the Royal College of Agriculture, Uppsala.

Mr. R. C. Kemp has been appointed to the Division of Physics where he will take part in the Division's research on paramagnetic resonance in the high frequency and far infra-red ranges. Since graduating B.Sc. from the University of Bristol in 1961, Mr. Kemp has been studying for his Ph.D. in the Department of Electronic and Electrical Engineering at the University of Birmingham.

Mr. B. G. Tucker has been appointed to the Division of Coal Research where he will undertake fundamental research in the kinetics of the reactions of carbon with oxidising gases. This work is part of the Division's programme on the gasification and combustion of solid fuels. Since graduating B.Sc. from the University of Wales in 1961, Mr. Tucker has been undertaking research at the same university for his Ph.D. His research has been concerned with the reactions of trifluormethyl radicals with halogenated compounds. Mr. Tucker is a keen athlete and is the Welsh mile champion. Last year he was a member of the British Universities team at the World University Games in Brazil.

Fulbright Fellow

Dr. R. E. Peterson, Director of Endocrinology in the Department of Medicine at Cornell University Medical College is spending twelve months at the Division of Protein Chemistry as a visiting Fulbright scholar. Dr. Peterson is working on the isolation and characterization of aldosterone stimulating substances in biological fluids, particularly plasma and urine.

Dr. R. E. PETERSON

He is also investigating the physical chemical nature of the renal secretory product, renin, that acts as an aldosterone stimulating hormone in various animals. Biological assays of the various fractions prepared at the Division will be performed at the new Howard Florey Laboratories of Experimental Physiology at the University of Melbourne.

Mr. E. P. Lhuede has been appointed to the Division of Protein Chemistry where he will take responsibility for the industrial application of new processes, such as vacuum pressing of wool, formic acid rapid wool dyeing, and improved methods of drying and processing sheepskins. He will also plan additional accommodation and facilities in the

Mr. E. P. LHUEDE

Division for process development work of this kind. After graduating B.Mech.Eng. from the University of Melbourne in 1956, Mr. Lhuede spent a year as a design engineer with Industrial Engineering Ltd., Melbourne. Since 1958 he has been associated continuously with the coal-burning gas turbine project at the Aeronautical Research Laboratories of the Department of Supply.

Mr. T. J. Risdill-Smith has been appointed to the Division of Entomology where he will take part in a programme of laboratory and field studies on

Mr. T. J. RISDILL-SMITH

pasture insects in the New England Area of New South Wales. Mr. Risdill-Smith obtained his B.A. recently from the University of Cambridge.

Mr. I. M. W. Wood has been appointed to the Division of Land Research and Regional Survey where he will assist in the conduct of field experiments with arable crops at the Katherine Research Station. His work will be concerned particularly with cotton agronomy under dry land and irrigated conditions. Mr. Wood obtained his B.Sc. from the University of Tasmania in 1955 and his B.Agr.Sc. from the University of Melbourne in 1958. Since then he has been with the Cereal and Pulse Section of the Agronomy Division of the Tasmanian Department of Agriculture.

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CORESEARCH

FOR CIRCULATION AMONG MEMBERS OF CSIRO STAFF — NUMBER 71, MELBOURNE, FEBRUARY 1965

DEATH OF DR. DADSWELL

Dr. H. E. Dadswell, Chief of the Division of Forest Products, died suddenly last December at his home in the Melbourne suburb of Ringwood.

Dr. Dadswell, who was aged sixty-one, had a long and distinguished career in the field of wood chemistry and wood and fibre structure.

He obtained his B.Sc. from the University of Sydney in 1925 and his M.Sc. from the same university in 1927.

In 1926 he was selected as one of the first C.S.I.R. Overseas Research Students and spent two years at the U.S. Forest Products Laboratory at Madison, Wisconsin.

On return to Australia he joined the Division of Forest Products and commenced investigations into the chemistry of Australian timbers.

In 1931 he took charge of the Division's wood structure investigations.

He was awarded the degree of D.Sc. by the University of Melbourne in 1941 for a thesis and published work on the structure, identification, and properties of Australian timbers.

At the time of his death he had published more than one hundred papers on this and related subjects in the field of forest products research.

In addition to spending a period of study in the United States and Great Britain in 1935, Dr. Dadswell travelled overseas on several other occasions.

In 1955, he was invited to be the Walker-Ames Professor of Forestry for the Winter Term at the University of Washington, Seattle, U.S.A., and also by invitation, was a Guest Lecturer at the Special Field Institute in Forest Biology, North Carolina State College in 1960.

He represented Australia at a number of international forestry conferences in America, Europe and New Zealand.

Dr. Dadswell took a prominent part in a number of learned and technical societies and served as an office-bearer in most of these.

He was a member of the Council of the International Association of Wood Anatomists for a number of years and also of the Council of the Royal Australian Chemical Institute. He was President of the Institute in 1961-62.

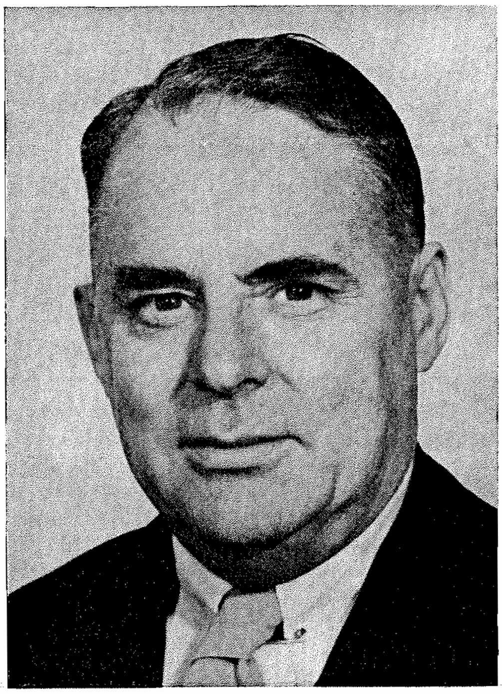
An active foundation member of APPITA (The Australian and New Zealand Pulp and Paper Industry Technical Association), he was its Treasurer for the first two years and President in 1950.

He was also a member of the Council of the National Association of Testing Authorities and an honorary member of the International Society of Wood Collectors.

In June, 1961, he delivered the inaugural Boas Memorial Lecture which was instituted by APPITA in memory of the late Mr. I. H. Boas who was the first Chief of the Division of Forest Products.

Although his main interests were in the field of fundamental research, Dr. Dadswell took an active interest in the applied work of the Division both in an administrative and an advisory capacity and was keenly aware of the needs of the various wood-using industries.

His personal reputation and his dedication to forest products research and utilization have brought world-wide recognition to the Division of Forest Products. Since his death tributes have poured in from all over the world from scientific organizations, forestry and forest products research centres, from the pulp and paper industry, and from international organizations such as F.A.O.



Dr. H. E. DADSWELL

Community Aid Abroad

A Community Aid Abroad Group has been established at Head Office to raise funds for assisting people in under-developed nations in Asia and Africa.

Community Aid Abroad (C.A.A.) is a non-political, non-religious organization which was set up in Australia about twelve years ago.

Its aim is to provide an opportunity for individuals in this country to participate constructively in the campaign against world poverty.

Broadly, the basis of the organization is the establishment of local C.A.A. groups in Australia which are each linked to a particular project in one of the under-developed countries.

The first task which the Head Office group has set itself is to raise £220 to help the small Indian village of Rupabad become self supporting.

Some thirteen families in Rupabad are supported by only ten acres of land.

Almost all of the families are subject to poverty and large debts.

Plans for the future include village industries, improved housing, a poultry farm, improved farming methods and educational programmes.

As well as C.A.A. assistance, Rupabad is receiving some development aid from local Indian Government and private organizations but without C.A.A. assistance these subsidies cannot be provided.

The money raised by the Head Office group will be used to help in the sinking of a well for irrigation, the purchase of seeds and fertilizers, the provision of housing for village poor, and the purchase of working bullocks.

It is hoped that with C.A.A. assistance this village will be self-supporting within five years and that income per head will rise to £3 per month.

Apart from the C.A.A. group in Head Office, groups have also been established in the Divisions of Protein Chemistry and Textile Physics.

The Protein Chemistry group has raised nearly £100 in the last five months and this money has been used to pay air freight on chickens sent to India and to support a C.A.A. project at Balampur in West Bengal.

This project is being supported by a number of C.A.A. groups which have joined together to try and raise £10,000 to provide aid to the 5,000 people who live in poverty in the area.

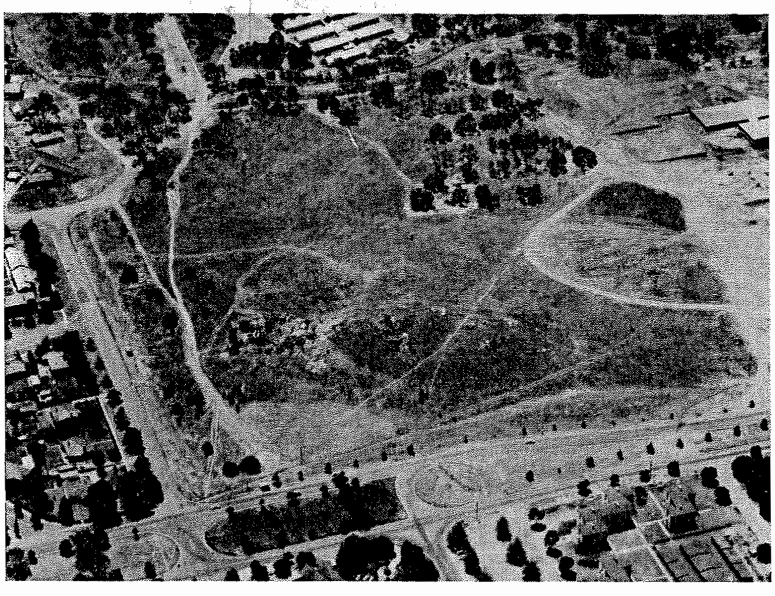
The money will be used, among other things, to purchase urgently needed farming equipment, to help establish further village industries, and to establish a revolving loan fund to free farmers from the hold of unscrupulous money lenders.

A recently formed C.A.A. group at the Division of Textile Physics has also undertaken to raise funds for the Balampur Project.

At the Division of Textile Industry, although there is no C.A.A. group, the social club recently raised £56 for the Balampur Project in a special appeal.

Anyone interested in forming a C.A.A. group in his Division should contact the Editor, "Coresearch", 314 Albert Street, East Melbourne.

CANBERRA SITE FOR HEAD OFFICE



Above is an aerial view looking east of the site selected for the proposed Head Office building at Canberra. The site which occupies an area of some ten and a half acres is bordered by Quick Street (left), Limestone Avenue (bottom), and the partly constructed Campbell High School (right centre). The Ainslie Hostel is at the top of the picture and the Hotel Ainslie Rex at bottom centre. The Australian War Memorial is a few hundred yards south east of the site.

APPOINTMENTS VACANT

The following vacancies for professional appointments are current:—

RESEARCH SCIENTIST (RS/SRS) — Division of Mineral Chemistry (601/29) (19/2/65).

RESEARCH SCIENTIST (RS/SRS) — Division of Coal Research (480/469) (26/2/65).

RESEARCH SCIENTIST (PHYSICAL CHEMIST) (RS/SRS) — Division of Coal Research (480/470) (26/2/65).

EXPERIMENTAL OFFICER (EO 1/2) — Division of Chemical Engineering (608/44) (26/2/65).

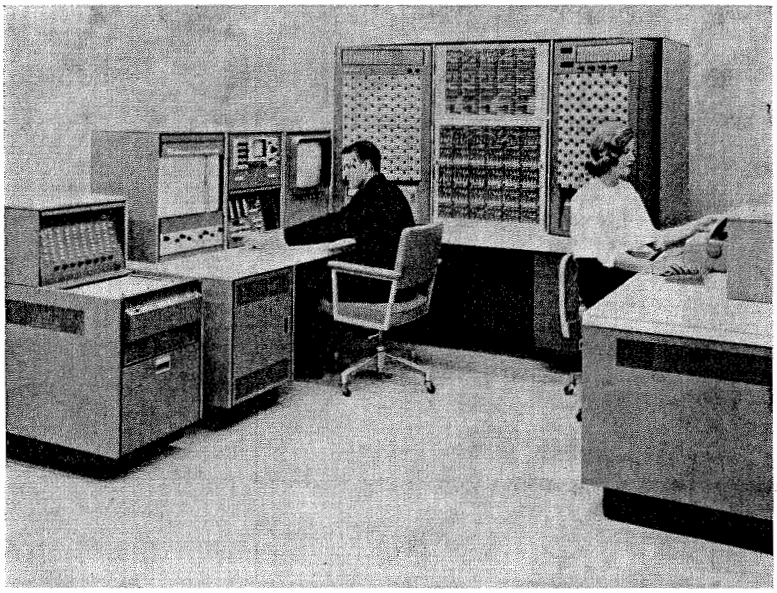
EXPERIMENTAL OFFICER (EO 1/2) — Division of Animal Physiology (246/185) (12/2/65).

RESEARCH SCIENTIST (BIOCHEMIST OF PHYSIOLOGIST) (RS/SRS) — Division of Food Preservation (300/398) (26/2/65).

RESEARCH SCIENTIST (RS/SRS) — Division of Chemical Physics (581/38) (26/2/65).

RESEARCH SCIENTIST (RS/SRS) — Division of Protein Chemistry (462/204) (26/2/65).

EXPERIMENTAL OFFICER (VETERINARY PARASITOLOGIST) (EO 1/2) — Division of Animal Health (201/244) (22/2/65).



Analogue Computer on Order

CSIRO has placed an order for a new £100,000 analogue computer with Electronic Associates Inc. of Long Branch, New Jersey, the largest manufacturers of analogue computers in the world.

The computer, known as EAI 8800, was released last October at the Joint Computer Conference in San Francisco.

The CSIRO order was the first one received for this computer, and the delivery of the machine next June will be the first in the world by several months.

The computer will be housed and operated by the Division of Chemical Engineering, but will be freely available to all Divisions.

An arrangement has been made with the Australian subsidiary of the manufacturers, EAI Electronic Associates Pty. Ltd., under which they will set up a computation centre making use of the computer during free time when it is not required for CSIRO use.

Any outside bodies wanting to use the computer will thus be able to arrange this through EAI.

The analogue machine is better described as a simulator rather than a computer, since it does not compute in the usual numerical way, but simulates a physical system by setting up an analogous electrical system.

The continuous variables of the problem are represented in the analogue by voltages.

The 8800 is one of the first fully-transistorized high-precision analogue computers to become available, and it is considered to be the first in which full advantage of the potentialities of transistors has been taken.

It is extremely compact and is capable of operating with accuracy at higher frequencies than any previous machine.

As a result of this, processes which may take hours can be simulated in seconds; the use of analogue techniques will thus greatly facilitate experimentation.

The order is for an 8800 with analogue elements only; however, the system is capable of being expanded to form a hybrid analogue-digital computing system, including patchable logic elements in the 8800, and also a digital computer.

Besides straight simulation, the computer will be capable of high-speed iterative operation, such as automatic optimisation and automatic parameter searching in the fitting of mathematical models to processes.

Considerable use of the computer is expected in many topics of chemical engineering such as process dynamics, process control, process optimisation, and reactor design, and further applications are expected to be found in practically all branches of physical science.

CSIRAC OUSTS KELLY GANG

Retirement has been accompanied by new fame for CSIRAC, one of the oldest digital computers in the world.

As mentioned in last month's "Coresearch", CSIRAC, which was designed and constructed by the Division of Radiophysics after the last war, was pensioned off recently after long and faithful service and was moved to the Institute of Applied Science in Melbourne.

On the arrival of CSIRAC at the Institute it was decided that one of the museum's most popular attractions, the Ned Kelly exhibit, should make way for a display of calculating devices and computers.

Accordingly, the 94 lb. suit of home-made armor worn by Steve Hart of the Kelly Gang was banished unceremoniously to the museum's vaults along with some rifles used in the outlaw's battles with the police.

The assistant director of the Institute said, "I feel it is wrong to worship a gang of horse thieves and murderers who were hated by the people of Victoria at the time."

"The Kelly exhibit has no place in the Institute."

"Ned Kelly does not fit in with the evolution of science."

"His armor, made from plough shares stolen from farmers, is not even a very good example of protective plating."

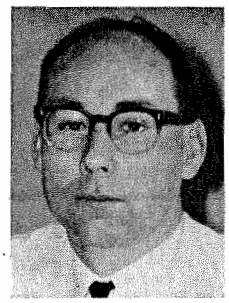
So far, however, there has been no talk of shifting the museum's other most popular exhibit — Phar Lap — another famous Australian who came to an untimely end.

At the children's Christmas party held in the grounds of the Division of Meteorological Physics at Aspendale last December, Divisional Secretary, Mr. P. Berwick proved a popular Father Christmas. Pony rides, picture shows, an outdoor playground, and plenty of ice cream and lemonade ensured an enjoyable time for the fifty children who went along.

VISITORS FROM OVERSEAS

Dr. R. I. Reed of the Organic Chemistry Department, Glasgow University is at present spending three months with the Division of Coal Research. Dr. Reed is well known for his pioneering work in the application of mass spectrometry to determination of chemical structure. He was the first research worker to apply mass spectrometry to sugars, steroids, and terpenoid compounds and has gained an international reputation for his work with the latter two compounds.

Dr. K. M. King, Associate Professor in the Department of Soil Science, at the University of Ontario, arrived in Melbourne recently where he will spend six months working with the Division of Meteorological Physics in the fields of micrometeorology and evaporation.



Dr. K. M. KING

Professor M. W. Miller of the Department of Food Science and Technology, University of California, Davis, is at present spending seven months as a Fulbright Scholar with the Fruit and Vegetable Processing Section of the Division of Food Preservation.

Open Day

The Division of Building Research will be holding Open Days on Wednesday 24th and Thursday 25th March.

The Open Days are mainly for those concerned with the building trade and are aimed at demonstrating the research activities of the Division.

The exhibits cover a number of fields including architectural acoustics, bituminous materials, building operations and economics, ceramics, concrete, fibrous plaster, glass, gypsum, joints and sealants, masonry, mineralogy and crystallography, mortar, paint, solar radiation, stone, surfacing materials, thermal investigations, and tropical building research.

The Division will be open from 1.30 p.m. to 4.30 p.m. and from 7.00 p.m. to 9.30 p.m. on Wednesday, and from 10.00 a.m. to 1.00 p.m., 1.30 p.m. to 4.30 p.m., and 7.00 p.m. to 9.30 p.m. on Thursday.

Sandwiches will be available at lunchtime on Thursday for those visitors attending both morning and afternoon sessions.

LOCUST TEAM ARRIVES

A team of three experts from Britain's Anti-Locust Research Centre arrived in Australia last month to undertake a survey of locust outbreak areas in collaboration with the Division of Entomology.

The team consists of Dr. R. C. Rainey, Head of the Desert Locust Information Service; Miss Z. Waloff, Head of the Bio-Geographical Section, and Mr. C. Ashall, Head of the Field Section.

Except for one species, the locusts most harmful to Australia and the areas served by the Anti-Locust Research Centre in London have little in common.

Economically, the most important of the Australian locusts and grasshoppers, the Australian plague locust *(Chortoicetes terminifera)* is most abundant in north-western N.S.W., southern and south-western Queensland, south-eastern Northern Territory and north-eastern South Australia.

Since the problem was last reviewed by Dr. K. H. L. Key of the Division in the 1940s, climatic conditions have changed, with a series of wetter and cooler summers, and the locust invasions have spread over wider areas.

Entomologists from the Division, led by Dr. D. P. Clark, are working on the problem, and surveys of the Bulloo River and Coopers Creek areas in Queensland were made in April and November last year.

Dr. Joyce Magor, on secondment to the Division from the Anti-Locust Research Centre, has assisted over the past two years in the development of the bio-geographical work involved.

The visitors will contribute experience and techniques developed in the Anti-Locust Research Centre and in the course of field work in Africa and the Middle East.

In turn, they hope to learn from the experience of their Australian colleagues about much of the research and control work on the Australian plague locust.

Dr. Rainey will lead the aerial observations and reconnaissance side of the work.

Miss Waloff will be mostly concerned with locust swarm behaviour and with surveying scattered locust populataions.

Mr. Ashall will concentrate on hopper band work and long-range ground survey activities.

The team will be in Australia about three months.

News In Brief

Acting Chief

Following the death of Dr. H. E. Dadswell, Mr. J. D. Boyd has been appointed Acting Chief of the Division of Forest Products.

Coal Research Committee

Mr. L. Lewis, Executive Officer, has been appointed as CSIRO representative to the National Coal Research Advisory Committee. The Committee will report on all coal utilization research in Australia and will advise the Commonwealth and State Governments on the allocation of funds to various coal research programmes.

Grasslands Congress

At the recent Ninth International Grasslands Congress in Sao Paulo, Brazil, Australia's invitation to act as host country for the Eleventh Congress in 1970 was accepted.

O.B.E.

Dr. A. T. DICK

Dr. A. T. Dick of the Division of Animal Health was awarded an O.B.E. recently in the New Years Honors Lists for meritorious public service.

Head Office Finance

Following the return of the Deputy Finance Manager, Mr. McVilly, from Thailand last November, the Head Office Finance Branch has been reorganized to enable the Finance Manager, Mr. Viney, to concentrate on matters relating to financial policy and to deal with specific problems raised by members of the Executive.

Mr. McVilly will be responsible for the day to day activities of the branch which covers four sections. Mr. D. J. Bryant will be in charge of contracts and stores, Mr. M. F. Combe of special projects including industry funds, Mr. I. F. Currucan of the budget section, and Mr. K. L. Hodges of accounting.

Secretary

Dr. E. F. Henzell of the Division of Tropical Pastures has been appointed Secretary of the Queensland State Committee.

Charity Fund

In the last twelve months the Division of Textile Industry's Social Club has donated more than £600 to a number of charities. As mentioned on page one, the club raised £56 recently for Community Aid Abroad.

The club has also given £28 to the Save the Children Fund, £70 to various other charities, £218 to the Geelong Community Chest which supports local charities, and £226 to the Staff Benevolent Fund which is used to support various worthy causes among some members of the Division's staff and their families.

Happy Note

Head Office heralded the New Year with a highly commendable but somewhat macabre circular — "Employee's Compensation — Increased Benefit".

The attachment to this circular, after briefly mentioning the amounts payable for loss of sight or hearing, concentrates its attention on the loss of limbs or parts thereof with a thoroughness unrivalled except by "Gray's Anatomy".

Altogether it lists forty-one bits and pieces of leg and arm, including such esoteric items as — "loss of portion of terminal segment of right thumb involving one-third of its flexor surface without loss of distal phalanx or joint — £602".

The fingers and thumbs come in for a good deal of attention, comprising some twenty-eight alternative means of compensation (calculated no doubt on a digital computer).

There is also an apparent discrimination against the left-handed, compensation for loss of a left hand being less than that for a right hand. However, the legal interpretation of left hand is right hand, and right hand left hand, in the case of the left-handed.

The Division of Building Research has found epoxy resins just the thing for sticking bricks together. Miss Janet Ward gives an elegant demonstration of their adhesive power.

Zebu Sales

In last year's sales of stud beef cattle in Queensland, top sales average was secured by the National Cattle Breeding Station "Belmont", Rockhampton, at its third reducing sale in March. At this sale eighteen Brahmans averaged 1015 guineas with a top sale of 3400 guineas. The eighteen animals sold in a total of fifty-five minutes.

Obituary

Mr. G. E. Nightingale of the Division of Physics was killed in a motorcar accident last month while on holidays.

Mr. Nightingale joined the Division in 1953 and immediately proved himself to be a superlative glassblower with an enthusiasm for his work, an ability to solve difficult technical problems, and a keenness to help others.

He also proved himself to have an integrity, sincerity and kindliness which quickly turned all his associates and colleagues into his friends.

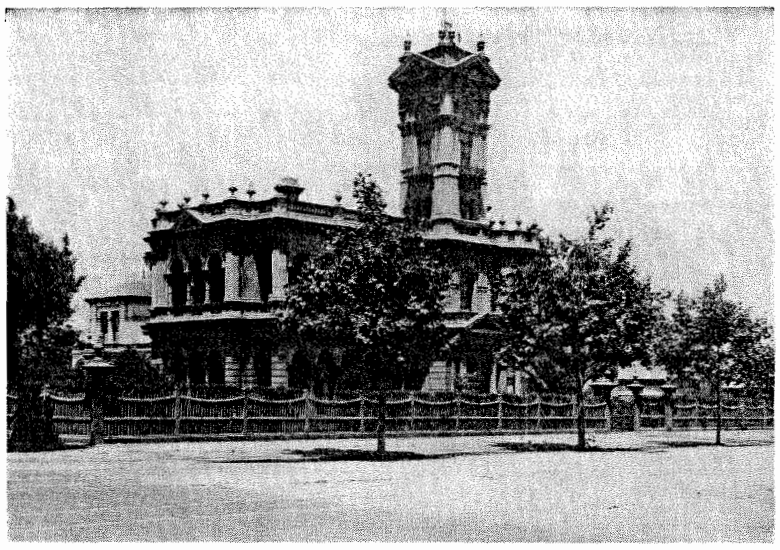
He gained his early training in glassblowing in England where he worked as a glassblower for nine years and then as a scientific glassblower for sixteen years, mainly in the electronics field.

Immediately before emigrating to Australia, Mr. Nightingale was Chief Glassblower of 20th Century Electronics Limited and was ranked among the top few glassblowers in Great Britain.

While with CSIRO he constantly came up with novel applications and techniques for the use of glass and glass-like materials and the laboratories of the Division of Physics and indeed many other laboratories in Sydney contain many tributes to his skill and ability.

He will be greatly missed by his many friends in the Division.

HEAD OFFICE AS IT NEARLY WAS



"Fitzroy House", an elegant fourteen room building in St. Kilda Road, Melbourne, came close in 1919 to becoming the home of Head Office. In that year the Advisory Council for Science and Industry, which later became the Institute of Science and Industry and then C.S.I.R., obtained approval to enter into negotiations to purchase Fitzroy House at a cost of £7,500. However, approval was withdrawn at the last moment and the Council moved to rented accommodation in the centre of Melbourne and then to the old building of the present Head Office in Albert Street, East Melbourne.

MEASURING THE SHAPE OF A 210 FOOT DISH

The Division of Radiophysics has collaborated with the Division of Applied Physics in developing a special instrument for measuring the shape of the dish of the 210 foot radiotelescope.

The instrument allows rapid semi-automatic surveys of the shape to be carried out at any tilt angle.

Small survey targets are arranged on the dish in concentric rings at measured radial distances from the centre of the dish.

The new unit consists essentially of a telescopic camera which records the positions of these targets on 35 mm film; it is installed at the centre of the dish, the pyramid-shaped pedestal projecting above the paraboloid surface and the telescope and camera being suspended below.

The pedestal carries a small plane mirror which may be set by an indexing control to select a particular ring of targets, after which it rotates automatically to view each target in turn.

An enlarged image of every target in the ring can be photographed against a fixed graticule background in four minutes at any zenith angle of the radio telescope.

Other target rings are photographed in sequence after resetting the mirror.

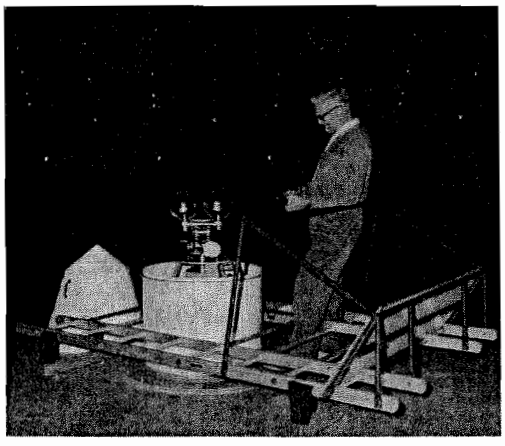
Spotlights above the mirror mounting rotate in synchronism with the mirror and illuminate a beaded reflecting surface behind each target.

This provides a bright background against which the target is seen in silhouette, either by night or day.

A feature of the instrument is that the mirror head can be replaced either by the telescope or by a theodolite.

The first arrangement permits reference targets in the hub to be viewed for alignment purposes, while the second can be used for absolute calibrations of target position.

Tests have confirmed the stability and precision of the instrument and some preliminary surveys have been made of the changes of paraboloid shape with zenith angle.



Below. The survey camera installed in the dish. The bright spots of light in the background are from the target-monitoring points on the surface of the dish.

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Overseas Visits

Mr. J. J. Basinski of the Division of Land Research and Regional Survey will leave Australia shortly on a five months visit to Mauritius, Uganda, Sudan, Israel, Italy, Greece, U.K., Canada, and the U.S.A. where he will study large-scale crop production techniques applicable to northern Australian agriculture. Mr. Basinski will also study advances in tropical crop research, particularly cotton, both at the applied and basic levels.

Mr. G. Blackburn of the Division of Soils will leave later this month for six months overseas during which time he will study soils associated with limestone, especially in the Mediterranean region, and soils associated with plant species native to the Mediterranean region and of particular interest for Australian agriculture. He will also study coastal dune formation in Europe and North Africa.

Mr. K. R. Norris of the Division of Entomology will leave Australia shortly for overseas where he will visit museums and entomological research centres in South Africa, Egypt, England, Europe, U.S.A., Hawaii and Fiji. He will be away for about four months.

Mr. A. J. Higgs of the Division of Radiophysics will leave Australia shortly as a member of the Australian delegation to the interim meeting of the International Radio Consultative Committee Study Group IV which will be held in Monte Carlo. He will return early next month.

Dr. O. H. Frankel of the Executive will attend the meeting of the Special Committee for the International Biological Programme of the International Council of Scientific Unions which will be held in Rome shortly. He will also spend some time in Rome with F.A.O. before returning to Australia at the end of the month.

Dr. C. H. B. Priestley, Chief of the Division of Meteorological Physics, left Australia recently for India where he will give lectures and have discussions with the Government of India Meteorological Department at the Institute of Tropical Meteorology, Poona. Dr. Priestley will also attend a meeting of the World Meteorological Organization Advisory Committee at Geneva, and will spend two weeks in the U.K. visiting the British Meteorological Office and meteorological research centres. He will return to Australia via Hong Kong next month.

APPOINTMENTS TO STAFF

Dr. J. H. Brooks has been appointed to a Research Fellowship with the Division of Textile Industry where he will undertake basic studies on the soiling of fabrics. After graduating B.Sc. from the University of Manchester in 1956 and M.Sc. from the same university in 1958, Dr. Brooks


Dr. J. H. BROOKS

went to the University of Sydney where he obtained his Ph.D. in 1961 for studies on fatty alcohol monolayers. Since 1961 Dr. Brooks has been engaged in industrial research on basic surface-chemistry with the Unilever Company in Britain.

Mr. C. A. Smith has been appointed to the Division of Tropical Pastures where he will take part in the Division's programme of pasture research in the brigalow region of Queensland. Mr. Smith will be concerned with the extension of this work into the Fitzroy Basin south-west of Rockhampton and will concentrate mainly on the ecology of pasture legumes in mixed pastures. Mr. Smith graduated B.Agr.Sc. from Lincoln College, New Zealand, in 1948, and M.Agr.Sc. from Massey College, New Zealand, in 1951. From 1949 to 1953, he was an agrostologist with the Grasslands Division of D.S.I.R., and since 1953 has been Pasture Research Officer in the Ministry of African Agriculture, Northern Rhodesia. His work in Northern Rhodesia was concerned mainly with the utilization by cattle of native pastures and to a lesser extent with the development of improved pastures and grass/legume associations.


Mr. C. A. SMITH

QUEEN ELIZABETH FELLOWSHIPS

Two recipients of the first Queen Elizabeth Fellowships awarded recently by the Commonwealth Government will work with CSIRO Divisions.

Dr. C. Harris will spend two years with the Division of Organic Chemistry where he will work on various aspects of free radical chemistry. After working for six years in the chemical industry in Britain,


Dr. C. HARRIS

Dr. Harris turned to academic work and gained his degree of Ph.D. from the University of Manchester for a thesis on free radical addition reactions. Before coming to Australia he spent a year as Postgraduate Fellow at Texas Technological College, Lubbock.

Dr. T. W. Scott will spend two years with the Division of Animal Physiology where he will work on the effect of hormones on phospholipid metabolism in animal tissues and on the digestion of phospholopids in the alimentary tract of the sheep. After graduating B.Sc.Agr. from the University of Sydney in 1958 and Ph.D. from the same university in 1961, he obtained an I.A.E.A. Post Doctoral Fellowship at the Agricultural Research Council's Institute of Animal Physiology at Cambridge. For the last two years he has been a Research Fellow in Medicine at Harvard University.

Dr. K. G. McK. Skene has been appointed to a Post Doctoral Fellowship in Plant Physiology in the Horticultural Research Section. After graduating B.Agr.Sc. from the University of Melbourne in 1956, Dr. Skene became an agrostologist and extension officer with the Victorian Department of Agriculture. In 1959 he went to the Department of Botany at the University of Melbourne and obtained his Ph.D. there in 1962 for his work on the role of native gibberellins in the control of seed development. Since then he has been working at the California Institute of Technology on the relation between native gibberellins and flowering.

Miss N. E. Smith, a recent science graduate from the University of Queensland, has been appointed to the Division of Applied Physics where she will join a small group engaged on the mechanism of dielectric absorption in solids. Present


Miss N. E. SMITH

work is concerned with the relationship between crystalline imperfections and dielectric absorption in both alkali halides and simple organic compounds.

Miss A. F. Woodlock, a recent science graduate from the University of Melbourne, has been appointed to the Division of Protein Chemistry where she will assist in research on the structure and properties of hides and skins and of the leather obtained from them. Their properties will be related to the genetic and nutritional background of the animals from which the


Miss A. F. WOODLOCK

hides and skins are derived and to the methods of hide preservation, handling and transport.

Dr. J. B. Hacker has been appointed to the Division of Tropical Pastures where he will take over and develop a breeding programme on grasses in the genus *Setaria.* After graduating B.Sc.(Agric.) from the University of Reading in 1960 he spent twelve months at the University gaining experience in cytology and cereal breeding. Since 1961 he has worked on cytogenetics at the Plant Breeding Institute at Cambridge University. He obtained his Ph.D. from Cambridge last year for his studies on aneuploids in oat varietal populations.

Mr. K. Yano has been appointed to the Upper Atmosphere Research Section where he will spend two years assisting in the Section's work on optical studies of the upper atmosphere. After graduating


Mr. K. YANO

in science from Niigata University in 1954, Mr. Yano became a research associate in the Faculty of Science at that University where he worked on the optical measurement of air glow and aurora. He was appointed Instructor in Physics at the University in 1961.

Dr. G. W. Evans has been appointed to a Post Doctoral Fellowship with the Division of Protein Chemistry where he will undertake research on the structure of hides and skins and their preparation for tanning using appropriate physical and chemical methods. Dr. Evans graduated B.Sc. from the University of Adelaide in 1961 and obtained his Ph.D. from the same university in 1963 for his work on the mechanism and applications of copper catalysed free radical reactions. He spent last year as a research student in the Department of Organic Chemistry at the University of Liverpool where his research was concerned mainly with radioactive tracer techniques in the study of biosynthetic pathways.

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CORESEARCH

FOR CIRCULATION AMONG MEMBERS OF CSIRO STAFF — NUMBER 72, MELBOURNE, MARCH 1965

HONOURS

Fellow

Dr. O. H. Frankel of the Executive, has been elected a Fellow of the World Academy of Art and Science.

Other Australian Fellows of the Academy include Mr. C. S. Christian (elected last year), author Morris West, and Sir Mark Oliphant.

The Academy was established at the end of 1960 and is designed to function as a "world university" of experts on subjects of the highest scientific and ethical importance.

Its aims are to create a forum for the interchange of knowledge and information, and for the study, independent of national barriers, of problems whose settlement is vital to the well-being of mankind, and to act as a dispassionate advisory body to the leading international organizations, for the benefit of mankind as a whole.

The Academy has less than 200 Fellows; of these some twenty are Nobel Laureates.

The Academy's President is Lloyd Boyd Orr, and some of its past and present Fellows include: Albert Einstein, Earl Russell, Aldous Huxley, Yehudi Menuhin, Henry Moore, Robert Oppenheimer and Linus Pauling.

Associateship

Dr. D. Martin of the Division of Plant Industry has had conferred upon him an Associateship of Honour of the Royal Horticultural Society of London.

Dr. Martin is Officer-in-Charge of the Tasmanian Regional Laboratory, Hobart.

The Associateship is awarded to "persons of British nationality who have rendered distinguished service to horticulture in the course of their employment".

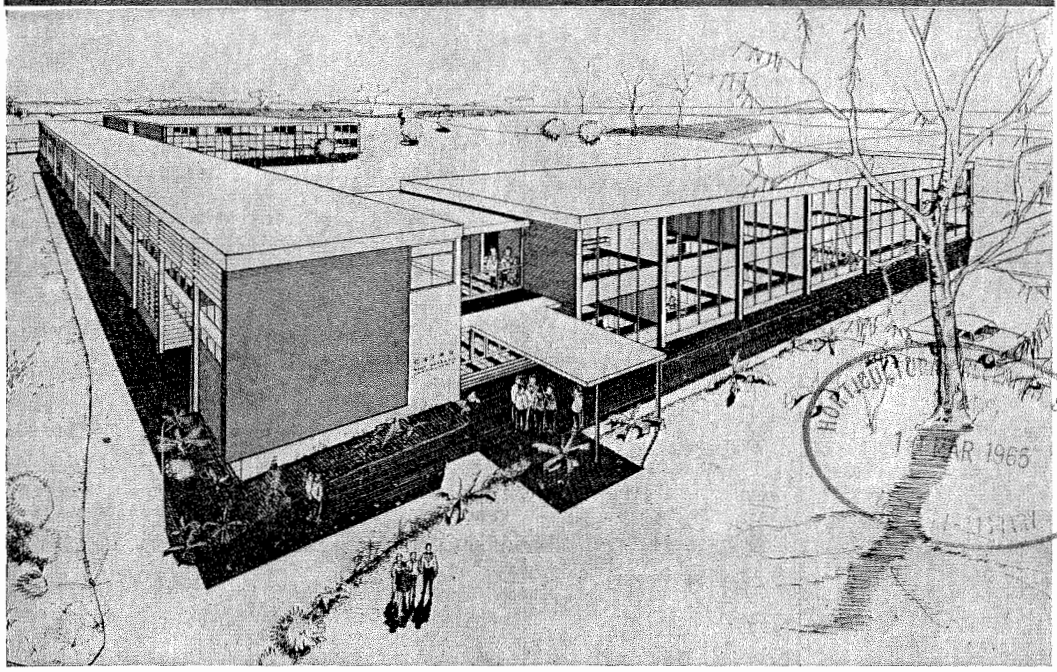
It is the highest honour given by the Society to British persons not resident in the U.K.

For many years Dr. Martin has led a research team in Tasmania on investigations into the relationship between orchard conditions, fruit size, and keeping quality in apples.

His research findings have given a much clearer understanding of the basic physiology of apples, how this is affected by cultural practice and its important bearing on the problems of apple storage.

Dr. Martin is also well known for his knowledge of eucalypt ecology and taxonomy. He has made a special study of eucalypts introduced to Britain, Ireland and parts of North America.

NEW MEAT RESEARCH LABORATORY FOR BRISBANE



Above is an architect's impression of the new meat research laboratory to be built for the Division of Food Preservation at Cannon Hill, Brisbane. It will be built about two miles from the Division's present meat research laboratory which was established more than thirty years ago. The new laboratory, which was planned by the Head Office Buildings Branch, will be of two storeys and will have a floor area of about 27,000 square feet. It will consist of two parallel laboratory blocks (running from left to right in the above picture) linked by an administration and amenities block containing a library, offices, and mechanical plant. The Australian Cattle and Beef Research Committee has provided £224,000 and the Commonwealth Treasury £26,000 for stage one of the building. Stage one will consist essentially of one laboratory block and half of the administration and amenities block. The Commonwealth Department of Works is now preparing working drawings and specifications, and it is expected that the construction of stage one will commence about August this year and will take about eighteen months.

Assistant Chief For Soils

Dr. T. J. Marshall, leader of the soil physics group of the Division of Soils, has been appointed Assistant Chief of the Division.

After graduating B.Sc.(Agric.) from the University of Western Australia in 1928, Dr. Marshall joined the Division of Soils.

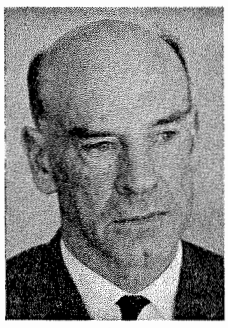
His work was concerned mainly with relating soil texture and structure to the behaviour of soil water.

In 1933 he received the degree of M.Ag.Sc. from the University of Adelaide.

He was awarded a studentship in 1936 and spent the next two years at the University of California where he obtained his Ph.D. for a thesis on the unsaturated permeability of soil materials.

Because of his knowledge of the physical and mechanical properties of soils, he became involved during the War in the selection of sites for the construction of airfields in northern Australia.

He also became associated with soil surveys in connection with post war land settlement.



Dr. T. J. MARSHALL

In 1944 he was appointed head of the Division's soil physics and mechanics section.

He built up around him a strong research team and gained an international reputation for his work on the physical properties of soils with special regard to soil water relations and soil structure.

He is Vice-President of the Australian Society of Soil Science, and last year was made a Fellow of the Australian Institute of Agricultural Science.

POSITIONS VACANT

The following vacancies for professional appointments are current:

EXPERIMENTAL OFFICER (AGRONOMIST (EO 1/2) — Division of Plant Industry, Deniliquin (132/148) (21/3/65).

EXPERIMENTAL OFFICER (CHEMIST) (EO 1/2) — Kimberley Research Station, Division of Land Research and Regional Survey (620/41) (12/3/65).

RESEARCH SCIENTIST (PLANT BREEDER) (RS/SRS) — Division of Plant Industry (130/687) (19/3/65).

RESEARCH SCIENTIST (HYMENOPTERIST) (RS/SRS) — Division of Entomology (180/297) (5/3/65).

RESEARCH SCIENTIST (AGRONOMIST/PLANT — PHYSIOLOGIST) (RS) — Irrigation Research Laboratory, Griffith (500/177) (5/3/65).

PRINCIPAL RESEARCH SCIENTIST (PLANT PHYSIOLOGIST) (PRS) — Irrigation Research Laboratory, Griffith (500/178) (5/3/65).

APPROACH TO SCIENCE

On Friday, February 19th, the premiere of CSIRO's latest film "Approach to Science" was held at the theatrette in I.C.I. House, Melbourne.

The film, which is dedicated to the memory of Sir Ian Clunies Ross, was made on the recommendation of the CSIRO Officers' Association.

The Association acted in an advisory capacity in the making of the film.

Among the distinguished people at the premiere were Lady Clunies Ross and members of her family, prominent educationists, and representatives of Melbourne and Monash Universities.

"Approach to Science" is a 30-minute, colour, sound film which sets out to demonstrate to young people the nature of scientific research.

How to do this is quite a problem and an idea of the difficulty is conveyed in an article by Dr. P. U. A. Grossman in the December, 1964, issue of the CSIROOA Bulletin.

The film is aimed at young people faced with the choice of a career.

It falls naturally into two parts — the nature of scientific training and the application of that training to a problem.

The training sequences were filmed at Monash University, where the Film Unit had the help and co-operation of Professor Street.

The first sequence shows the undergraduate scientist at work in lecture theatre and laboratory, verifying natural laws, developing experimental skills, tackling more and more complex problems.

This is followed by a sequence on graduate training.

The student is shown working on superconductivity. The various preliminary stages of the project — posing the question, literature search, experimental design, construction of apparatus — are dealt with in turn.

The final and longest sequence shows a research scientist at work on an important national problem — bushfire control.

The work described is that of Dr. A. R. King, who until recently was with the Division of Physical Chemistry.

King is showing analysing data about bushfires, from old films, from the literature and from his own experiments.

His objective was to protect the fire-fighter from smoke, anoxia, thermal radiation and burning.

The film shows how radiation was identified as the main danger, and how King, by patient experiment was able to design highly efficient protective equipment.

The dramatic climax of the film comes when King himself tests his equipment by allowing a bushfire to overtake him, an experience he emerges from unscathed.

STRICTLY FOR THE BIRDS

Through the ages birds have been marked for a variety of reasons: for communication in war, to establish ownership — particularly of royal swans and falcons, to send out distress messages or celebrate survival, and in the cause of genuine investigation and inquiry.

Pliny writing in the first century A.D., tells of nesting swallows brought by a Roman sporting gentleman from his home in Tuscany to the chariot races at Rome.

The swallows, painted with the winning colours, were later released to carry back news of the racing results to his friends at Tuscany.

Bird-banding, as a scientific method, is, however, an entirely modern technique for its success depends not only on the spirit of research which activates it, but also on up-to-date methods of metal-working and improved communications.

Bird-banding as we know it today was first used by a Danish ornithologist, Christian Mortensen who, in 1899, placed aluminium rings, stamped with numbers, on the legs of young starlings.

The success of his methods, and the enormous possibilities they opened up, soon captured the attention of amateur and professional ornithologists and, within ten years, banding schemes were operating in several European countries and in North America.

Many of these were started by amateur bird-watching societies but the task of recording and analysing the data, and of organising the supply of bands and equipment rapidly outgrew the resources of amateur bodies and today nearly all national bird-banding schemes function under the aegis of a government department of agriculture or wildlife service.

Before the advent of banding our knowledge of birds — their distribution in space and time, their plumages, breeding and behaviour — was based entirely on museum specimens or on direct observation of a group of unmarked individuals.

No really accurate information was available on the life-span of wild birds, age of breeding, polygamy, territorial behaviour, or the speed, distance and routes of migration.

There was, of course, a great mass of circumstantial evidence on these matters but, from a scientific standpoint, it could not be used as a sound basis for conservation programmes or control measures.

It remained for bird-banding to alter this state of affairs.

Some three million birds are now banded each year — about one and a half million in Europe, one million in North America, and half a million in other countries including Australia and Antarctica.

Although various bird-banding programmes have been undertaken in Australia since 1912, the first national scheme was begun in 1953 by the Division of Wildlife Research.

More than two hundred professional and amateur ornithologists now co-operate in this scheme under which some 80,000 birds are banded each year.

By Mr. W. B. Hitchcock
Division of Wildlife Research

Birds that nest in colonies, such as gulls, terns, ibises and shags, can be banded as chicks.

Free-flying birds are caught in various kinds of traps and nets, many of which are simply modern improvements of ones that have been used for centuries for catching birds for food.

Information recorded at the time of banding is entered on data sheets and sent to the Division's bird-banding office in Canberra, where it is machine-processed and analysed.

The number of banded birds recovered varies from one per cent to five per cent, for most birds, to about ten per cent for game birds such as ducks and geese which are hunted for sport.

Banding has revealed that some of our birds travel a long way from home.

Teal duck banded near Darwin have turned up in the south-west corner of Western Australia; mutton-birds from Bass Strait islands have been found in the far North Pacific; ibis banded at the Macquarie Marshes in central New South Wales have migrated to Cape York and Arnhem Land.

One seagull banded as a chick near Ulverstone, Tasmania, was caught nearly a thousand miles away at the mouth of the Richmond River, not far from the Queensland border.

Albatrosses and other sea-birds are also banded under the Australian scheme by the Australian National Antarctic Research Expeditions which go to Macquarie Island and the Antarctic continent.

Some of these birds have been recovered in New South Wales. Bands used in New Zealand, with the address of their banding headquarters, have also turned up in Australia.

The long-distance record for the homing of a banded bird is that of a British shearwater (a kind of mutton-bird) which was sent by plane from its nest at Skokholm to Boston, U.S.A., where it was then released.

It returned to its burrow on Skokholm in twelve and a half days, the distance direct over the sea being 3,000 miles.

One of the most interesting experiments ever carried out with banded birds concerns the mallard — the wild variety of the domestic duck.

Mallard eggs were sent from England, where mallards are sedentary, to Finland, where the species is completely migratory.

From these eggs sixty-two ducklings were reared and banded.

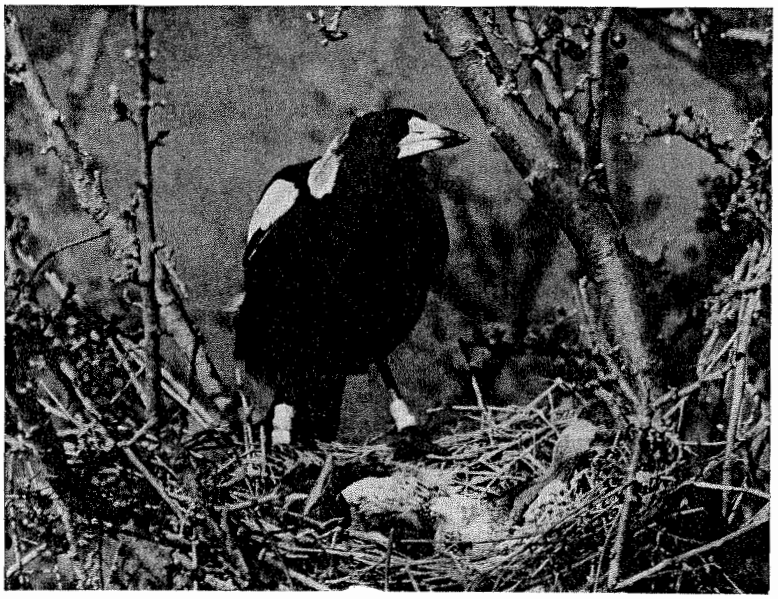
In October the young Finnish mallards made their normal flight southwards, but six remained with the group of young English mallards. All departed during November.

None of the English birds was recaptured in the British Isles, but more than half returned to breed in their hatching place in Finland.

This experiment would seem to indicate that the young mallard has no inborn or hereditary knowledge of the home of its parents.

If this holds true for other species it could well be turned to Man's advantage in the successful transplantation and acclimitisation of useful migratory birds.

Above. Banding a baby lyre-bird near Canberra.



Below. Magpie with colour-bands, at nest, Canberra.

Overseas Visits

Mr. G. S. Cottew of the Division of Animal Health, will leave Australia shortly for the U.K., where he will spend seven weeks at the Department of Animal Pathology, School of Veterinary Medicine, University of Cambridge, working on various serological and bacteriological aspects of mycoplasms. Mr. Cottew will also visit a number of Veterinary Research Centres in U.K., Europe, Canada and the U.S.A. before returning to Australia at the end of June.

Dr. J. K. Dineen of the Division of Animal Health left for the U.S.A. recently where he will spend six weeks visiting laboratories conducting fundamental research into parasite immunology. He will also spend six weeks visiting research centres in the U.K. before returning to Australia via Paris and Stockholm.

Mr. W. V. Morgan of the Division of Textile Industry left Australia last month for the U.S.A. where he will spend three months with the firm of Warner and Swasey assisting in the industrial development of the sliver convertor.

THOUGHT FOR THE MONTH

"Man can lie on his back, a posture long sustained by no other uncarapaced animal except in death. It is little wonder that his sleep is the amazement of the animal kingdom. It is superior to the long unconsciousness of hibernating animals. They curl their vegetative organs into the smallest bulk and lie in an uncomfortable tight knot in a condition near to death.

"How different is man! Man's great lungs heave and blow, his noble heart thuds merrily, and his marvellous bowels continue in gentle peristalsis, his brain is the house of a thousand lovely fancies, his liver, his blood, his glands, transform the dead cells of his food into the living elements of his body and slay his myriad of airy foes.

"He is badly constructed for locomotion by road or by tree. The slowest fish swims faster. He is adapted primarily for rest.

"This and much more to the same purpose we can learn from the contemplation of the umbilicus or navel."

From 'A Study of the Umbilicus' by the late Dr. O. H. Mavor.

SAFETY NOTES

Storing Petrol In Plastic

The Petroleum Information Bureau has warned against using plastic containers for carrying petrol.

When subjected to heat and involved in a fire, plastic of the type used in these containers, softens at relatively low temperatures and collapses. In a fire, these containers will burn through, release their contents and thus aid the spread of fire.

Plastics are not conductors of electricity and cannot be effectively earthed; static charges may therefore cause a spark when the container is brought close to a metal object, such as a fuel tank inlet.

Petrol will leach out some plasticisers, with the result that leakage may occur due to weakening of the seams or general brittleness of the material.

Dangerous vapour leakage may result from high ambient temperature unless the cap is effectively sealed.

If petrol is exposed to light, certain constituents may decompose and be precipitated in the form of a white powder, which could lead to blockage of filters and reduction in the anti-knock rating of leaded fuels.

The leaching of plasticisers may contaminate fuels by gum formation.

News In Brief

Foundation Fellows

Miss B. C. L. Doubleday, Chief Librarian, Miss B. E. Johnston, Librarian of the Division of Food Preservation, and Miss M. E. L. Archer, former Chief Librarian, have been elected Foundation Fellows of the Library Association of Australia.

Honorary Reader

Dr. D. W. Goodall of the Division of Mathematical Statistics has been appointed Honorary Reader in the Department of Botany at the University of Western Australia.

Civil Defence

Dr. D. W. Posener of the Division of Applied Physics has been seconded for a period of twelve months as scientific adviser to the Commonwealth Directorate of Civil Defence. He will advise in particular on the development of the Civil Defence Scientific Service. This service is concerned with monitoring the atmosphere and giving warnings of radioactive fallout. Dr. Posener has been carrying out research on the microwave structure of gases, particularly water vapour.

Community Aid Abroad

Since the Head Office Group of Community Aid Abroad launched its appeal last January to raise £220 to assist the Indian village of Rupabad, it has received donations of more than £150. CAA groups already exist in the Divisions of Protein Chemistry and Textile Physics and it is hoped that other Divisions and Sections will follow suit by establishing their own groups.

Sheepskins for Prince

Two medical sheepskins, developed by the Division of Protein Chemistry to relieve skin irritations suffered by bedridden patients, have been given by the Australian Wool Board to the ailing Crown Price of Korea, Prince Yi.

Definition

Ecologist: A person who calls a spade a geotome.

Information Please

CSIRO is often called on to answer some ticklish questions. The Division of Protein Chemistry, for instance, recently received, in one day, three phone calls — one from a film producer who wanted to know how he could dye sheep for a technicolour film, one from an anguished mother who wanted to know how to dye the tails of white rabbits in order to prevent her two daughters from arguing over the ownership of their identical pet rabbits, and one from a baker who wanted to know how to stop juice running out of his apricot pies.

Head Office also receives its quota of posers. There was the musician, for example, who was having difficulty in finding an ostrich feather to clean his oboe. Another musician of a different sort once inquired if there was anything he could put on his lips to keep them moist while he played on his gum leaf.

DEATH OF DR. WEISS

Dr. A. A. Weiss of the Division of Radiophysics died at Sydney Hospital on 30th December. He had known for the last year that he was suffering from leukaemia.

Dr. Weiss at the age of 47 was in the midst of a most productive research career in radio astronomy.

He took his B.Sc. with first-class honours in physics in 1951 at Adelaide University where he studied after serving for six years — including one year overseas — in the Army.

He was awarded a research fellowship for the years 1952-54 at Adelaide University to work on radar studies of meteors and also on ionospheric tides and structure in the Physics Department, then under the direction of Prof. L. G. H. Huxley.

During this time he spent six month at Jodrell Bank, England.

He gained his Ph.D. in 1954. Dr. Weiss continued his meteor studies at Adelaide, first with the Department of Supply, and then from August, 1955, with the Division of Radiophysics.

His observations and interpretations of echo rates and radiant distributions for shower and sporadic meteors in the Southern hemisphere established him internationally as one of the foremost workers in the field.

At the beginning of 1961 Dr. Weiss transferred to the Radiophysics Laboratory at Sydney where he joined the solar radio astronomers. Here he immersed himself in the problems of the radio bursts which accompany solar flares.

Aided by a large body of observational material, he pieced together a series of comprehensive papers on the various spectral types of bursts.

These papers are currently regarded as the last work on the subject, unmatched for their scope and thoroughness.

In his work, Dr. Weiss showed a clear perception of outstanding problems, a very sound understanding of the fundamentals of physics, and great competence in the techniques of data reduction.

Dr. A. A. WEISS

He was in his element when surrounded by large masses of complex data.

These characteristics, together with an unusual ability for concentrated effort, enabled him to complete quite copious research projects in remarkably short times.

Direct in his dealings with people, he revealed to those who knew him well, and especially to those who worked under his supervision, a deep strain of human understanding and sympathy.

To his fellow radio astronomers his untimely death means the loss of a staunch colleague and a good friend.

SCIENCE ON THE AIR

Ten years ago the British public learned almost nothing about science from the mass media. Since the first Sputnik went up, however, there has been a dramatic increase in the quantity and quality of science reporting.

The B.B.C. has played a leading role in this development, and a recent appointment by the A.B.C. suggests that the Commission may take the lead in similar developments in Australia.

The big years of change in Britain were 1958-61. Important science news moved from obscure corners of the newspaper to the front page.

Newspapers began appointing science writers to their staffs, and now every British national daily has one.

In 1958 the B.B.C. asked Mr. Aubrey Singer, a producer, to devote his whole time to the production of science programmes.

His early programmes were successful, and he soon formed a small unit.

Today this unit numbers about a dozen people. It produces several series of science features and a weekly educational programme. It tackles very difficult subjects with outstanding success.

Not content with televising science features, the B.B.C. has sought to incorporate science in its other programmes.

The news department, for example, has a scientist called David Wilson on its staff. On the average, a piece of science news handled by Mr. Wilson comes over on radio or T.V. or both once per working day.

Nor does B.B.C. science coverage end here. The Commission now has scientists on the staffs of its Talks Department and Education Department.

Better treatment of science by the mass media has been complemented by an increased effort in public relations and publicity by scientific organizations.

In D.S.I.R., for example, a small group of people under Mr. Norman Stone maintains liaison with the B.B.C. This liaison is fruitful, since D.S.I.R. is mentioned on B.B.C. programmes (home and overseas, radio and T.V.) about 600 times per year, covering some 1,500 audience minutes.

The average listening audience for this material is in excess of three and a half millions.

The situation in Australia is very different. Science writers in the national press are almost unknown.

Science coverage by the A.B.C. has been very small compared with the B.B.C., and the commercial stations almost completely ignore the subject.

The recent appointment by the A.B.C. of a scientist to its staff is thus of very great interest. It may well herald the beginning of a new approach to science by the Australian mass media.

The new appointee is Dr. Peter Pockley, an Australian scientist who took his Ph.D. in geochemistry at Oxford a few years ago, and who has since been teaching chemistry in Britain.

Before taking up his present post Dr. Pockley studied science broadcasting and television in Britain and North America.

Dr. Pockley has wide-ranging responsibilities. He will be concerned in all A.B.C. programmes dealing with science, whether they be features, talks, news, education, or anything else.

In a radio talk on 31st January he revealed some of the A.B.C.'s plans for improved science coverage.

Our picture shows Dr. R. Pockley (right) of the A.B.C. discussing a radio script with Dr. M. Lipson, Chief of the Division of Textile Industry.

A new programme called "Insight" will replace "Science Makes News". In "Insight" leading scientists will be taking long, hard looks at selected areas of current research.

News aspects of science, particularly Australian science, will be featured in a monthly programme called "Research Report".

A third new radio programme, "How and Why" will seek to satisfy listeners' curiosity about science.

Plans for new television programmes about science are well in hand, and are to be announced shortly.

One of Dr. Pockley's objectives is to learn all he can about Australian science and to establish contacts with Australian scientists.

He has already visited several CSIRO Divisions in Melbourne, Geelong, Canberra and Sydney, and he hopes to visit several more in the near future.

Copyright London Punch

"Will you tell Sir Charles Snow there ain't no power in these here corridors?"

Coffers Running Low

Although the CSIRO Co-operative Credit Society now has a paid up capital of £300,000, it still needs more funds to provide CSIRO staff with a source of low-interest finance.

A gilt-edged security investment of 6% a year is offered to investors in the Society for periods of twelve months or longer. Money may be deposited with the Society for shorter terms but in these cases the interest rate is 4%.

Recently the maximum amount that could be borrowed from the Society was increased to £2,000, repayable over a maximum period of ten years.

The unexpectedly large number of applications for loans of this size has made inroads into the Society's resources.

Loan repayment money, which now amounts to well over £5,000 a fortnight, is not sufficient to meet the Society's commitments, with the result that the waiting period for loans is now two to three months.

Increased investment will shorten this delay.

Investments in the Society will be accepted from CSIRO staff or their close relatives.

Small deposits are refunded on demand, but some notice is necessary if large investments are to be withdrawn.

All CSIRO staff may borrow from the Society, but they must become members of the Society first.

The minimum requirement for membership is the holding of five £1 shares in the Society.

These may be purchased outright or by instalments.

Flush With Coin

The Board of Directors of the Laboratories Credit Union Co-operative Limited, which provides loans to CSIRO staff members in N.S.W., has decided to raise the maximum loan limit on loans available through the Co-operative.

The maximum loan limit is now £1,000, repayable over a period of five years.

Generally, superannuation contributions are considered as satisfactory security.

At present there is virtually no delay in granting loans after approval has been given by the Directors. The Directors meet to consider loan applications fortnightly.

Anyone wanting a loan should contact the Secretary, Mrs. J. Ryan, at the Regional Administrative Office, Grace Bros. Building, 213-221 Broadway (telephone 211 3400).

VISITORS

Professor J. Balogh, Professor of Invertebrate Zoology in the Zoosystematic Institute of Eatvos Lorand University, Budapest, Hungary, visited the Division of Entomology recently where he had discussions with officers in connection with the proposed UNESCO soil biological expedition to Australia in 1966. Professor Balogh, who is a world authority on soil fauna, has organized expeditions to several countries under the auspices of UNESCO to make comparative studies of soil fauna.

Mr. R. Lloyd-Jones, Manager of the Patents and Licences Section of the International Wool Secretariat, arrived in Australia last month and has been visiting the Wool Research Laboratories and Head Office for discussions on the use of patent licences to promote the industrial applications of CSIRO research results. Mr. Jones has also been visiting university laboratories interested in wool research and several Australian manufacturers who are actively applying new wool technology.

APPOINTMENTS TO STAFF

Dr. J. E. Lane has been appointed to a Research Fellowship in Surface Chemistry with the Division of Physical Chemistry where he will take part in the Division's work on the mechanisms of spreading from solids and liquids at liquid surfaces and the influence of surface films on mass transfer and on liquid flow. Dr. Lane graduated B.Sc. from the University of Adelaide in 1957 and obtained his Ph.D. from

Dr. J. E. LANE

the same university in 1963 for his work on the surface properties of liquid alkali metals. Dr. Lane then spent a year in the Department of Metallurgy at the McMaster University, Ontario, Canada, where he studied multicomponent diffusion with emphasis on its relation to irreversible thermodynamics. Since 1963 he has been undertaking research in the Department of Physical Chemistry at the University of Bristol with a view to testing a simple model of the solid-liquid interface.

Mr. P. Farrington has been appointed to the Division of Plant Industry where he will assist in experimental field and laboratory work in Western Australia on the evaluation of perennial grasses and of site factors affecting their establishment and growth. After obtaining his B.Agr.Sc. from the University of Melbourne in 1958, and his Diploma of Education from the same university in 1959, he spent twelve months teaching at Bairnsdale High School in Victoria. Since then he has been engaged in research work with the Agronomy Section of the Victorian Soil Conservation Authority.

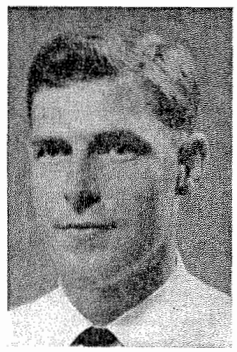
Dr. M. J. Playne has been appointed to the Division of Tropical Pastures. He will be stationed at Townsville and will be concerned with assessing the nutritive value and compositions of a wide range of tropical pasture plants at different stages of growth and at different seasons of the year. After graduating B.Agr.Sc. from the University of Queensland in 1961 and M.Agr.Sc. from the same university in 1962, he spent two years at the School of Agriculture of the University of Edinburgh, Scotland. He recently obtained his Ph.D. from there for his work on biochemical changes during ensilage.

Miss R. A. Sherwood, who graduated B.Sc. last year from the University of New South Wales, has been appointed to the Division of Food Preservation where she will assist in

Miss R. A. SHERWOOD

experimental studies of the properties and structure of bacterial spores, and in investigations of the microbial spoilage of foods. Miss Sherwood spent last year at the Biochemistry Department of the University of New South Wales working on mechanisms of oxidative phosphorylation.

Dr. P. S. Muecke has been appointed to the Division of Soils where he will take part in a research programme on the role of copper and cobalt in nitrogen fixation in legumes. After graduating B.Sc. from the University of Adelaide in 1959, Dr. Muecke was appointed



Dr. P. S. MUECKE

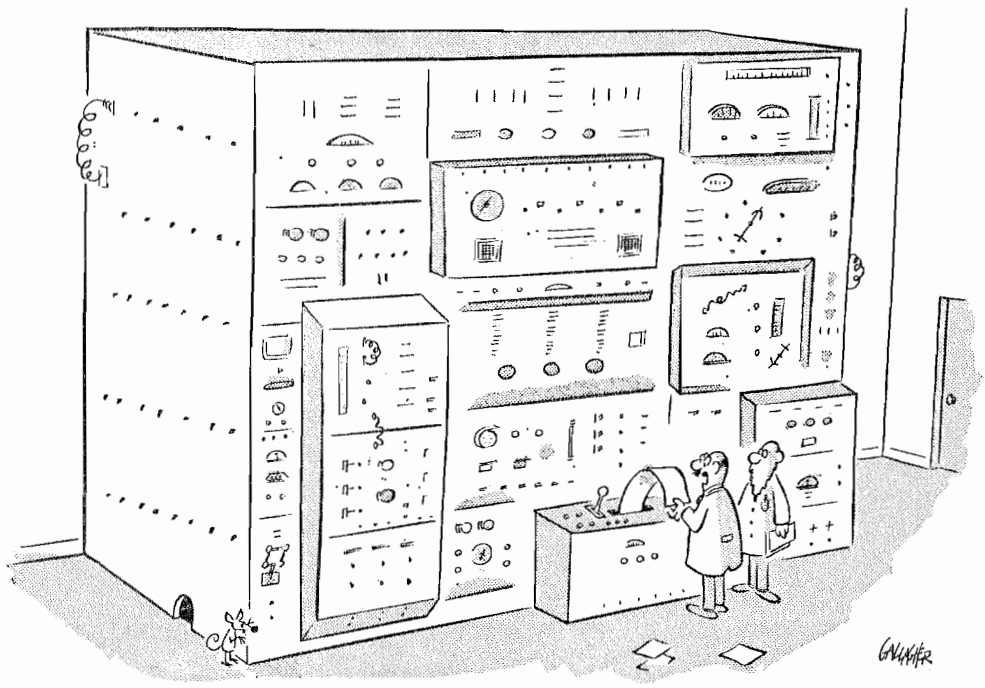
assistant lecturer in the Department of Biochemistry at the Medical School of Edinburgh University. He obtained his Ph.D. from the University of Edinburgh in 1963 for his research on the application of chromatographic techniques to the fractionation of histones. Since then Dr. Muecke has held a Post Doctoral Research Fellowship at the Department of Biochemistry of the University of Adelaide.

Mr. G. Stanley has been appointed to the Division of Food Preservation where he will take part in research on the chemical nature of food flavours and other food volatiles. After obtaining his Diploma in Chemistry from Granville Technical College in

Mr. G. STANLEY

1951, Mr. Stanley worked in the Egg Investigations Section of the Division of Food Preservation. In 1958 he joined Monsanto Chemicals and worked firstly in the plastics control laboratory and then in the research department. Mr. Stanley obtained his B.Sc. from the University of New South Wales in 1962.

Mr. O. L. Holmwood has been appointed to the Division of Textile Physics where he will assist in research aimed at improvements in the packaging and objective appraisal of greasy wool. Mr. Holmwood obtained his B.Sc. from the University of Sydney in 1962 and his B.E. from the same university in 1964. For the last twelve months he has been working as an assistant engineer with Australian Paper Manufacturers in Sydney.



"It keeps asking for cheese!"

Courtesy "The Saturday Evening Post".

Printed by CSIRO, Melbourne

CORESEARCH

FOR CIRCULATION AMONG MEMBERS OF CSIRO STAFF — NUMBER 73, MELBOURNE, APRIL 1965

CHANGES IN EXECUTIVE

Sir ARTHUR COLES

Mr. H. B. SOMERSET

Sir Arthur Coles retired from the Executive last month after being a part-time member for nine years. His place on the Executive has been taken by the Managing Director of Associated Pulp and Paper Mills, Mr. H. B. Somerset.

Sir Arthur, was born at Geelong, Victoria, in 1892, and educated at Geelong College.

When war broke out in 1914, he enlisted as a private in the A.I.F. and served in Gallipoli and France. He was wounded three times and received his commission in 1916.

After the war he joined partnership with his uncle and brother to launch the department store of G. J. Coles & Co. Ltd.

He opened the Sydney branch of the store in 1928 and managed it for the next three years. From 1931 to 1944 he was Managing Director of the firm.

Sir Arthur is Chairman of the Lady Northcote Trust and has been Chairman of the Geelong College Council for over twenty-five years.

He has also been Lord Mayor of Melbourne (1938-40), Member of Parliament for Henty (1940-46), a member of the Commonwealth War Workers' Housing Trust (1941-45), Chairman of the Commonwealth Rationing Commission (1942-50), Chairman of the War Damage Commission (1942-48), and Chairman both of British Commonwealth Pacific Airlines and of the Australian National Airlines Commission (which operates T.A.A.) from 1946 to 1950.

Sir Arthur became a part-time member of the Executive in 1956. He received his knighthood in the 1960 Queen's Birthday Honours List. His three brothers have also been honoured with knighthoods.

During his association with CSIRO he made a point of seeing as much as he could of the Organization's research activities, not only in the main research centres but also in the more remote areas such as northern Australia and the Gulf country.

One of his particular interests was the Commonwealth Agricultural Bureaux and he attended CAB Review Conferences in London in 1960 and 1963 as a member of the Australian delegation.

At the 1960 Conference he was appointed Chairman of the Finance Committee and was able to bring his considerable financial acumen to bear on the complex problems of Commonwealth co-operation.

He will attend the CAB Conference in London next July and will be joint leader of the Australian delegation.

Sir Arthur became involved in many important negotiations on behalf of the Executive, and the present high degree of co-operation between CSIRO and Control Data Corporation, which supplied the Organization's computer network, is due in no small measure to his personal efforts.

He also played a leading part in negotiations with the Western Australian Government for acquisition of the land in Perth on which the Organization's new Primary Industries Laboratory is to be built.

Sir Arthur's association with CSIRO climaxes a long and devoted career of public service. His quiet sense of humour, his drive, and his great wisdom, have earned him the admiration and affection of his colleagues on the Executive.

It is a matter for great satisfaction that Sir Arthur has agreed to give CSIRO still more of his time by serving as a member of the Advisory Council.

Mr. H. B. Somerset, who has taken Sir Arthur's place on the Executive, was born at Mt. Morgan, Queensland, in 1906.

He was educated at St. Peter's College, Adelaide, and at the University of Melbourne where he received his M.Sc.

After seven years with I.C.I.A.N.Z., Mr. Somerset joined Associated Pulp and Paper Mills in 1937. He became Managing Director of the Company in 1948.

Mr. Somerset was President of the Australasian Institute of Mining and Metallurgy in 1958, and was awarded a C.B.E. in 1961. From 1956 to 1960 he was closely associated with CSIRO as a member of the Advisory Council.

He is Chancellor of the University of Tasmania, Chairman of Humes Ltd. and Australian Titan Products Pty. Ltd., and a Director of I.C.I.A.N.Z., Electrolytic Zinc Co. Australasia Ltd., and Goliath Portland Cement Co. Ltd.

Rainmakers Fight Fires

Rainmaking aircraft operated by the Division of Radiophysics were used last month in the first attempt in Australia to combat forest fires by rainmaking.

When bushfires raged out of control in Victoria and New South Wales during the second week of March, fire fighting authorities sought CSIRO help.

A chartered Cessna was hurriedly equipped for cloud seeding operations in Victoria and arrived in East Sale on Thursday, 11th March.

The next day, suitable cloud conditions developed in the bushfire areas and Mr. K. J. Heffernan took off for the danger areas at 8.30 in the morning.

Cloud conditions were ideal and seeding operations were continued through the day until 4 p.m. A strong westerly wind was blowing, and the plane was operating about 70-80 miles upwind of the target area.

An hour after seeding commenced, rain began to fall in the target areas.

During the next few hours, falls of up to half an inch were recorded in the region of the fire front. By late afternoon the fire danger was very much reduced.

On the following day, cloud conditions were again favourable and the operation was repeated.

On this occasion more than one inch of rain fell in several of the fire areas. This practically eliminated the fire hazard.

The operations in New South Wales were not quite so successful.

Early in the week, CSIRO's own Cessna REK made a number of flights over the Southern Tablelands.

Radiophysics officers Frank Bethwaite, Arthur Tapp, and Cecil Maher, who participated in the flights, reported disappointing cloud conditions and little success. However, conditions improved on Friday, 12th March, and the Cessna flew over the danger areas from 2 p.m. until late at night.

Residents of the threatened town of Bundanoon heard the Cessna at 3 p.m. Soon afterwards rain started to fall and the threat to the town was averted. Light rain fell in several of the other danger areas.

These, of course, were emergency operations and it will never be possible to say with certainty whether the cloud seeding was really responsible for the rain which fell.

But the rainmakers are confident that they either caused the rain, or at least substantially increased it.

New Medal for Physicists

The Academy of Science is to create a special medal to commemorate the distinguished contribution to physics of the late Dr. J. L. Pawsey, Australia's pioneer in radio astronomy.

Dr. Pawsey was a Foundation Fellow of the Academy and Assistant Chief of the CSIRO Division of Radiophysics.

He began his studies in radio astronomy immediately after the war, making a series of observations on the newly-found radio emissions from the Sun; his papers provided the basis for the extensive solar studies that were to follow.

He gathered around him a group of physicists and engineers to pursue the new science, not only in the solar field but also in the study of the radio emissions from our galaxy and, as it was to turn out, from external and very distant galaxies.

He encouraged and stimulated his group, guiding them with inexhaustible enthusiasm and skill, into a series of crucial experiments which helped to reveal the nature of the radio universe.

The sequence of discoveries which emerged from this work

Dr. J. L. PAWSEY

includes the first direct evidence of the existence of radio stars and their accurate location; the first identification of radio stars with visible objects; the recognition of thermal radiation from the Sun's corona and of non-thermal radiation from sunspots; and the first detection of high-speed matter expelled from the Sun.

Each of these and other discoveries were followed up by searching investigations which gave Australian radio astronomy an international reputation, rarely, if ever, attained before in this country in the field of physical science.

Before his death in 1962, he received many honours; he was a Fellow of the Royal Society and was awarded the Society's Hughes Medal in 1960.

Between 1952 and 1958 he was President of the Radio Astronomy Commission of the International Astronomical Union.

At the age of fifty Dr. Pawsey had become the undisputed "Grand Old Man" of radio astronomy to whom colleagues of all nations turned for guidance and advice.

The Pawsey medal will be awarded annually, or less frequently, for distinguished research in physics carried out in Australia.

It will be available to scientists not over thirty-five years of age.

The award is to be endowed by a private appeal by a small group headed by Sir Frederick White.

POSITIONS VACANT

The following vacancies for professional appointments are current:—

RESEARCH SCIENTIST (POST DOCTORAL FELLOWSHIP) (RS/SRS) — Horticultural Research Section (490/151) (23/4/65).

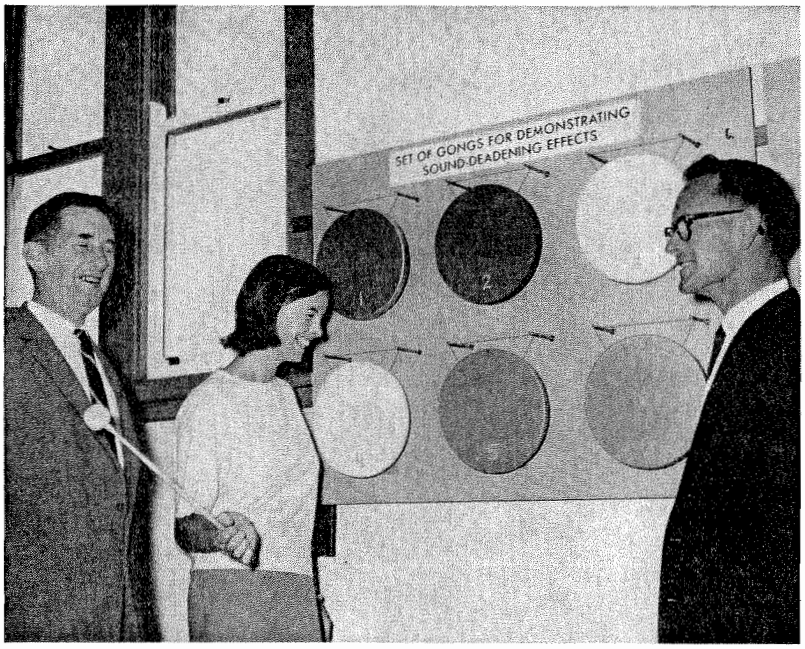
EXPERIMENTAL OFFICER (EO 2/3) — Division of Physics (770/288) (9/4/65).

SCIENTIFIC SERVICES OFFICER (SSO 1/2) — Division of Fisheries and Oceanography (320/312) (9/4/65).

EXPERIMENTAL OFFICER (EO 1/2) — Division of Building Research (390/331) (9/4/65).

SCIENTIFIC SERVICES OFFICER (SSO 1/2) — Division of Animal Physiology (245/320) (9/4/65).

RESEARCH SCIENTIST (RS/SRS) — Division of Building Research (390/318) (5/4/65).



OPEN DAYS AT BUILDING RESEARCH

On Wednesday and Thursday, 24th and 25th March, the Division of Building Research held its first Open Days since 1959. The last Open Days were described in the very first issue of "Coresearch" which appeared exactly six years ago.

The opening address was given by Lord Casey, who spoke from the "Gunyah" a dais built from masonry blocks held together with adhesives instead of mortar.

Fears that the concrete roof might fall on his lordship's head were discounted by the Division. "And after all" they said, "it's only light weight concrete".

Lord Casey said that the Division of Building Research was an essential link in the chain of research bodies concerned with building and related engineering in Australia.

The Open Days, he said, were designed to reflect some of the more important aspects of the Division's work, particularly to architects, builders and manufacturers.

Lord Casey spoke of the importance of the Division's new programme of work on operational research in building.

Many building techniques had been in use for centuries, and were more enshrined in tradition than logic.

In illustration, Lord Casey quoted a poem of Kipling's describing a visitation of Pharaoh the Great to a modern building site.

"Your glazing's new and your plumbing's strange;
But otherwise I perceive no change
And in less than a month if you do as I bid
I'd learn you to build me a Pyramid."

Visitors to the Open Days saw evidence of much progress in the Division's established lines of research.

The displays showed how far work had advanced on gypsum, fibrous plaster, acoustics, thermal investigations, masonry, paint and organic materials.

Four entirely new lines of work were on display for the first time.

These described flat plate concrete construction, building operations and economics, tropical building research, and new building materials.

Flat plate is the name given to a particular type of structure that has become very popular in Australia during the last ten years or more for all forms of multi-storey buildings such as flats, car parks, and hospitals.

The important feature about flat plates is that there are no beams and the concrete floor slab is connected directly to the columns.

This makes a much simpler structure that is usually quicker and cheaper to build.

Although this form of structure has these advantages there was uncertainty about a number of aspects of the engineering design when the study was begun at the Division six years ago.

Above. Mr. A. Nickson (left) and Mr. W. Davern watch while Miss M. Seels demonstrates on the gongs.

Below. Mr. D. Beresford explains to visitors how strains in a flat plate under load are measured.

In particular, there was a lack of knowledge about the deflection of the floors and the strength of the joints to the external columns.

Methods of design and construction have been developed to avoid the troubles that have arisen through deflection of the slabs.

The investigation has been made on four large experimental structures. Two of these have been tested to destruction and removed; two remain standing.

Tests are also being made on full-size specimens representing the joints between edge columns and a slab.

Extensive mathematical analyses have been made in addition to the experimental work.

It is most notable that all this work has been possible only because of the generous and wholehearted co-operation of a number of builders, suppliers and other firms.

Their outstanding assistance has made it possible to do more comprehensive testing than has been done anywhere else in the world.

The operations research exhibit focussed on construction management problems, measurement and estimation of productivity of the building industry, predicting of demand for building, study of the fundamental causes of cost and the extent to which these affect differing types of building contract, and examination of the reasons for financial instability in the industry.

The Division's work in New Guinea began in 1962 when an office was established in Port Moresby.

Work done so far has demonstrated a potential for a lime burning industry, and small lime kilns have been designed for the purpose.

The use of pumice, which is present in large deposits, as a concrete aggregate is being studied.

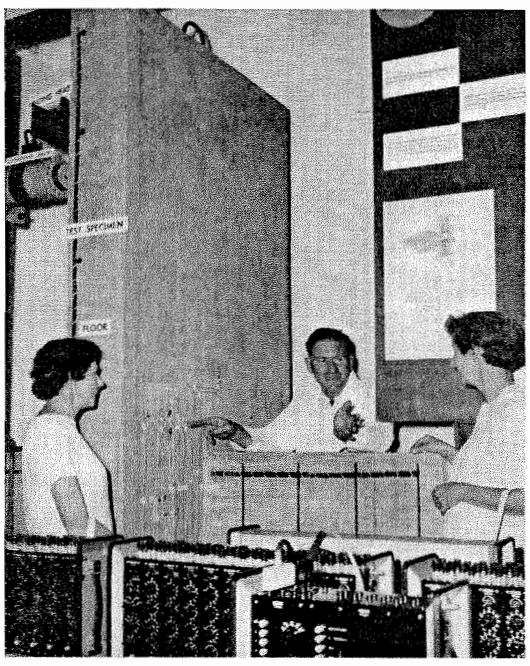
Other lines of work are concerned with the collection of climatic data and the effect of type of house construction on the internal environment.

A number of entirely new materials and processes were on display.

Of special interest were new light weight bricks, blocks and panels.

Lightweight clay or shale aggregate is mixed with powdered rock or scrap glass, and organic binder is added, and the mix is shaped by pressing or casting in moulds before firing.

The bricks, blocks and panels produced in this way are attractive, light, have good thermal insulation properties, and can have a variety of finishes.



SAFETY NOTES

Belt Up And Live.

On present casualty rates one member of every young family of four in Australia today will probably become a victim of a road accident within the next ten years.

Last year some 18,000 drivers and passengers were killed or seriously injured on Australian roads. Had they been wearing seat belts at the time, it is estimated that up to 15,000 of these people would have avoided death or serious injury.

Four types of belts are available — lap, diagonal, combination lap and diagonal, and full harness. Lap belts are much better than no belts; however, when used alone they still allow the upper part of the body to jack-knife forward and hit the dashboard, windscreen or steering-column.

In selecting the type of belt best suited to your need make sure that it complies with the current Australian standard, and make sure that it is the type that will be used every time you drive the car, even for a short trip to the corner store.

Seat belts should be expertly installed. Faulty installation by an amateur can render seat belts useless.

Seat belts should be used on all occasions even for short trips. Serious injury can be inflicted at impact speeds as low as 10 miles per hour.

Remember, if you become involved in an accident, you and your passengers face five times the risk of death or injury if thrown out of the car. Seat belts make drivers and passengers five times as safe.

Safety Film

A copy of "Seven-tenths of a Second" — a thirty-minute film produced commercially in Australia and including overseas as well as local film material and graphic animation on the value of safety belts in vehicles, has been procured by the Safety Officer and lodged with the Film Unit Library.

The film has been made available on the strict understanding that it be used solely for internal screening within CSIRO.

Divisions and Sections wishing to show this film to their staff can make a booking by contacting Mr. P. Roberts, Film Librarian, at Head Office.

Executive Functions

In an address to the Victorian Branch of the Royal Australian Chemical Institute last month, the President of the Institute, Professor G. M. Badger spoke on the role of CSIRO in Australia's development.

He said that as the real work of CSIRO was carried out by the Divisions and Sections it seemed perfectly reasonable to ask what the Executive did.

Professor Badger then illustrated the role of the Executive by telling the following story of the centipede who had arthritis in every leg.

"One day, when he was walking along very slowly and painfully, the centipede came across one of the wise old owls.

"He explained to the wise old owl that he suffered terribly, that the pain in each of his 100 legs was unbearable, and asked for advice.

"The wise old owl agreed that the centipede had a real problem and said that he would consult the other owls before giving a considered opinion.

"Next morning, the wise old owl sought out the centipede and said: 'We have considered your problem, and we have come to a conclusion.

'We think that you should convert yourself into a swallow.

'In this way the number of your legs will be reduced from 100 to 2 and, moreover, you will be mainly on the wing and not using your legs.

'In this way, the pain should be considerably relieved.'

"The centipede considered this suggestion for a minute and then said, 'I accept your advice. How do I go about effecting this transformation?'

'Oh, said the wise old owl, the Executive only decide matters of policy. The manner of carrying out a research project is left strictly to the individual research scientisis'."

News In Brief

Study Conference

Sir Frederick White has been appointed a member of the planning committee for the third Duke of Edinburgh study conference which is to be held in 1968.

Industry Link

The development of operational research in the Division of Building Research will be assisted by a Building Operations and Economics Advisory Committee.

The Committee includes people actively involved in building, architecture, quantity surveying, civil engineering, building materials production, and economic research. Mr. I. Langlands, Chief of the Division, and Mr. W. B. Kennedy, who is in charge of the Division's operational research, are ex officio members.

Administrative Course

Mr. J. Coombe, Senior Staff Officer, is attending the advanced course at the Australian Administrative Staff College at Mt. Eliza, Victoria.

The aim of the ten week course is to prepare experienced administrators to accept growing responsibility by providing opportunities for critical study of the fundamentals of the process of management. The course will end early next month.

Advisory Council

The next meeting of the Advisory Council will be held at Menzies Hotel, Sydney, on 18th and 19th May.

Representative

Mr. L. Lewis, Executive Officer, has been appointed CSIRO representative on the Australian National Committee of the World Power Conference.

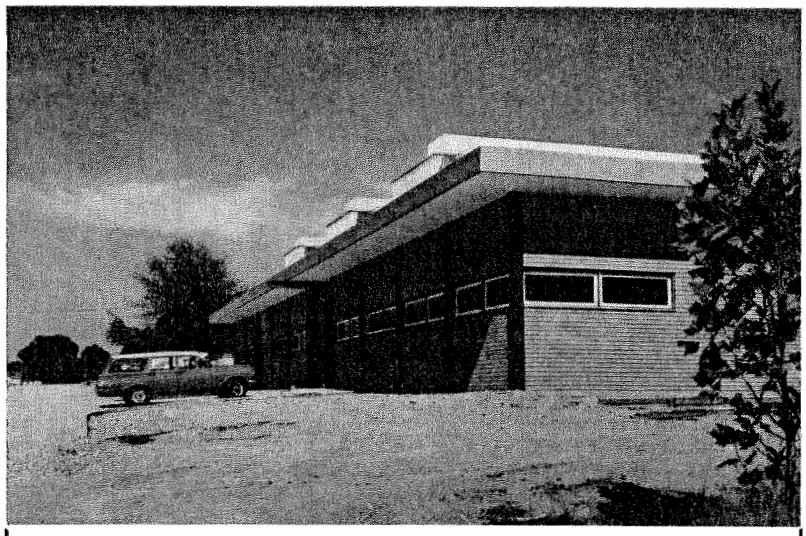
Research for Australia

A new edition of "CSIRO — Research for Australia" has just been published. The first edition, published in 1962, contained sixty pages of general information about the history and achievements of CSIRO. The edition of 15,000 copies was exhausted within 18 months of publication.

The second edition, also of 15,000 copies, has been enlarged by four pages and has short chapters about every Division and Section in the Organization. It has a full-colour cover and the text has been brought up-to-date to the end of 1964.

Storm in a Teacup

As one cloud said to the other when the rainmakers flew by, "Will you pour or shall I?".



When completed this month, the above building will house all sections of the Division of Plant Industry's workshop. These sections were previously located in a group of separate sheds on the Black Mountain Site. The new building has a total floor area of about 10,000 square feet; offices and washrooms occupy some 2,000 square feet of this. Special attention has been given to the improvement of the site by providing for landscaping by the Department of the Interior and by incorporating in the building a sub-station to serve both the workshop and the proposed Pye Laboratory. In spite of the general rise in building costs, the workshop was erected for less than the original financial provision.

CUTTING THROUGH HISTORY

Radio carbon dating provides a reasonably accurate means of dating archaeological remains of an organic nature such as wood, charcoal, and shells, which are up to 50,000 years old.

Certain corrections are necessary, however, to maintain this accuracy.

In order to establish new correction figures, the Institute of Nuclear Sciences of the New Zealand Department of Scientific and Industrial Research has been looking for wood with well-marked annual rings which could be counted.

To help with this project the National Museum of Victoria recently obtained a disk of kauri from the Queensland Forestry Department.

The disk, which was from a tree felled in the early 1930s when it was some 600 years old, was 8 ft. 6 in. in diameter and 10 to 12 in. thick.

In order to keep a portion as an exhibit in the Institute of Applied Science in Melbourne, it was decided to cut the disk into two disks, and the Division of Forest Products was asked to undertake this difficult cutting task.

The disk was first bound with steel strapping to prevent any cracking; it was then supported on edge.

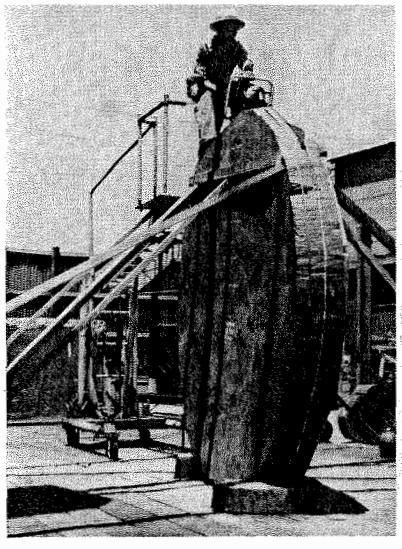
The sawing was done using a chain saw with a 50 in. cutter bar.

With the assistance of a mobile platform, the cut was started from the top of the disk.

After cutting all around to the full depth of the saw, a small section in the middle remained which was cut through with a cross-cut saw.

After removal of some samples for investigation at the Division, the disk for New Zealand was cleated to ensure that it held together and then enclosed in a plastic envelope to protect it from contamination while on board ship.

Bottom left. Commencing the cut.
Bottom right. Separating the two disks.



Back to School

Twenty-six sheep and wool extension officers from State Departments of Agriculture visited a number of CSIRO establishments last month during a refresher course.

This was the fourth of a series of courses arranged jointly between Departments of Agriculture, CSIRO, and the Australian Wool Board, to speed up the flow of technical information from research worker to extension officer.

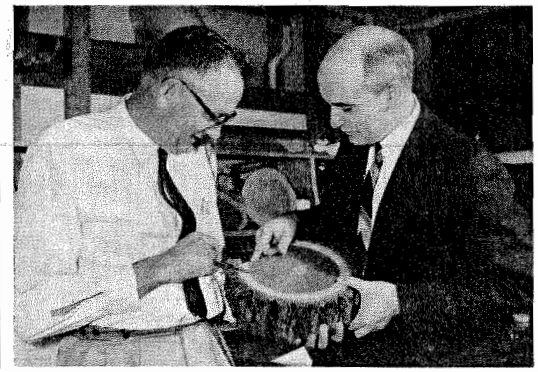
The first week of the course was held at the Division of Plant Industry, Canberra, the second week at Armidale and Trangie, and the third week at the Ian Clunies Ross Laboratory, Prospect.

Visitor

Dr. J. A. F. Gardner, Dean of the Faculty of Forestry, University of British Columbia, Canada, is spending three months in the Division of Forest Products. He is collaborating with officers of the Division in a study of the formation of various wood extractives.

Until recently, Dr. Gardner was Superintendent of the Vancouver Laboratories of the Forest Products Research Branch of the Canadian Department of Forestry. He is an authority on the extractives in North American timbers and the industrial problems caused by their presence, as well as being an authority on other aspects of wood utilization.

Our picture shows Dr. Gardner (right) examining a piece of red ironbark with Mr. W. E. Hillis of the Division of Forest Products.



This Month's Overseas Travellers

Mr. H. R. Brown, Chief of the Division of Coal Research, will set out later this month on a seven month visit to coal research centres in Japan, Europe, U.K. and North America. While overseas he will attend a number of international conferences.

Mr. J. Czulak of the Division of Dairy Research will visit the U.S.A. shortly to advise on the operation of automatic cheese-making machinery. He will be away for about six weeks and will return via the U.K. where he will examine trends and prospects in cheese mechanization.

Dr. E. Hoffmann of the Division of Building Research leaves this month on a five month visit to New Zealand, North America, U.K., Europe, U.S.S.R., Israel and India. He will look at research on paint chemistry and analytical chemistry and will attend conferences in England, Finland and Russia.

Mr. L. Peres of Head Office left recently for overseas in connection with the UNESCO Seminar on Research Organization and Administration which will be held in Sydney next August. The Seminar is to be organized by CSIRO and Mr. Peres will be its Director. While overseas he will visit North America, the U.K., UNESCO headquarters in Paris, and a number of Asian countries which will be sending participants to the Seminar. He will be away six weeks.

Dr. J. A. Roberts of the Division of Radiophysics will make a short visit to the Arecibo Radio Astronomy Centre in Puerto Rico next month to attend a symposium on planetary atmospheres and surfaces. The symposium is being organized jointly by the Union Radio Scientifique Internationale and the International Astronomical Union. Dr. Roberts will deliver a review paper on Jupiter as observed at short radio waves.

Sir Frederick White left early this month for the West Indies. He will spend a week there before flying on to London, where he will begin a three month visit to industrial research centres in the U.K. and Europe. Sir Frederick will also deliver a paper to the Third International Wool Textile Research Conference in Paris.

Dr. J. A. Wunderlich of the Division of Organic Chemistry will spend April in Japan attending a one month training course in the routine maintenance and operation of the mass spectrometer which has been acquired by the Division.

Refresher Course

As part of the recent J. D. Stewart refresher course on "Infertility in Sheep" organized by the Post Graduate Committee for Veterinary Science at Sydney University, more than thirty veterinary surgeons took part in talks at the Division of Animal Physiology's Ian Clunies Ross Animal Research Laboratory at Prospect.

These talks were given by research workers from the Divisions of Animal Physiology, Animal Genetics, and Plant Industry, and from the University of Sydney.

The balance of the course was held at the University of Sydney's farm at Camden where further talks and demonstrations were presented by officers of the New South Wales Department of Agriculture, members of the University Veterinary School and private practitioners.

The participants in the course included property owners, private practitioners, State Departmental officers and university staff from four States.

Our picture shows Dr. B. A. Panaretto of the Division of Animal Physiology explaining various aspects of animal surgery to the visiting vets.

APPOINTMENTS TO STAFF

Mr. B. J. Bridge has been appointed to the Division of Plant Industry where he will assist in investigations on water relations of irrigated pastures with special reference to production and irrigation frequency. He will be stationed at the Division's Regional Pastoral Laboratory at Deniliquin. After graduating B.Sc.Agr. (Hons.) from the University of Sydney in 1957, Mr. Bridge spent two years with the

Mr. B. J. BRIDGE

New South Wales Department of Agriculture working on spray irrigation. Since 1960 he has been a research officer with the New South Wales Water Conservation and Irrigation Commission.

Mr. R. M. Duffy has been appointed to the Division of Applied Physics where he will assist in new developments related to the application of electronics and optical interferometry to precise measurements. He will also be responsible for the development, operation, and maintenance of a variety of electronic equipment. Mr. Duffy obtained his Diploma in Radio Engineering from Sydney Technical College in 1955 and his B.E. from the University of New South Wales in 1961. From 1955 to 1958 he carried out design work on UTAC, the University's analogue computer and

Mr. R. M. DUFFY

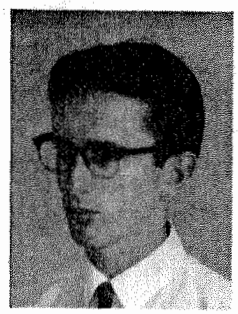
for the last six years he has been working with National Transformers Pty. Ltd. on the design of electronic industrial devices.

Mr. R. J. Clements, who graduated B.Rur.Sc. (Hons.) from the University of New England last year, has been appointed to the Genetics Section of the Division of Plant Industry where he will take part in a comprehensive pasture plant breeding programme with particular emphasis being given to phalaris and lucerne.

Mr. R. J. CLEMENTS

Mr. Clements will be concerned both with species improvement and with research into theoretical and practical aspects of selection methods.

Dr. A. B. Pittock has been appointed to the Division of Meteorological Physics where he will undertake a programme of research in upper atmosphere studies with emphasis on ozone, the analysis of ozone behaviour in the Southern Hemisphere and its implications in the study of high level circulations, and the development and exploitation of techniques for determining vertical distribution. Dr. Pittock obtained his B.Sc. in 1958, M.Sc. in 1960, and Ph.D. in 1963, all from the University of Melbourne. Since 1963 he has been carrying out research on vertical distribution of ozone as a visiting research fellow at the National Centre for Atmospheric Research, Colorado, U.S.A.



Dr. A. B. PITTOCK

Mr. R. W. King, who graduated B.Sc.Agr. from the University of Sydney last year, has been appointed to the Division of Plant Industry where he will

Mr. R. W. KING

assist in the running of the Phytotron at Canberra. Mr. King will also supervise experiments conducted in the Phytotron for people outside Canberra.

Miss G. SLACK

Miss G. Slack, who graduated B.Sc. (Hons.) from the University of Queensland last year, has been appointed to the virology section of the Division of Animal Health where she will assist in biochemical and biophysical studies of viruses affecting farm livestock.

"Y'know what I miss, though? — that good old pouring stuff from one test tube into another."

Keep It Coming

The response to last month's appeal in "Coresearch" for further investment in the CSIRO Co-operative Credit Society has so far been very good.

However, the Directors of the Society have stressed that more investors are still required to help the Society function more efficiently.

Apart from applications for smaller loans and loans required for urgent personal expenses, which can be dealt with fairly promptly, applicants for larger loans up to the maximum of £2,000 are faced with a waiting period of from four to five months before their loans can be paid.

This waiting period would be considerably lessened if there was increased investment in the Society.

The Directors offer the investor a gilt-edged investment of 6% per annum for monies placed on deposit for periods of twelve months or more, but a lower rate is paid for periods of less than twelve months.

Enquiries may be directed to the Assistant Secretary of the Credit Society, Mr. J. Stodart, Head Office, or to the Divisional representative of the Society.

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CORESEARCH

FOR CIRCULATION AMONG MEMBERS OF CSIRO STAFF — NUMBER 74, MELBOURNE, MAY 1965

NEW CHIEF FOR ADELAIDE

Dr. C. H. Gallagher of the Division of Animal Health has been chosen to succeed Dr. H. R. Marston as Chief of the Division of Biochemistry and General Nutrition. Dr. Gallagher will take up his new appointment when Dr. Marston retires in August.

After war service as a bomber pilot with the R.A.A.F., Dr. Gallagher proceeded in 1947 to Sydney University where he graduated with first-class honours in veterinary science.

Dr. Gallagher has made notable advances in his studies on the chemical pathology of the hepatotoxic alkaloids heliotrine and lasiocarpine, on the disturbances of liver function in pregnancy toxaemia of ewes, and on carbon tetrachloride poisoning in sheep.

In 1952 he joined the Division of Animal Health and began work at the McMaster Laboratory on the pathology of helminthiasis in sheep.

The following year he was awarded an overseas studentship and during 1953-55 he worked at University College, London. He subsequently received the degree of Ph.D. from the University of London for studies on the enzymological and biochemical disturbances associated with copper deficiency.

In 1955-56 he spent twelve months in the Department of Physiological Chemistry at the University of California under a United States Health Research Grant. He returned to Australia in 1956.

In 1961 he and Professor J. F. Sprent of the University of Queensland were jointly awarded the Payne Exhibition of the University of Melbourne for original research making the most important contribution to veterinary science.

He was awarded the degree of D.V.Sc. by the University of Sydney in 1963 for a thesis entitled "Studies on the Biochemical Basis of Pathology".

Last year Dr. Gallagher was awarded the 1964 David Rivett Medal of the Officers' Association jointly with Dr. E. O. P. Thompson of the Division of Protein Chemistry for outstanding research in the biological sciences.

Dr. C. H. GALLAGHER

Dr. Gallagher received the award for his work on the biological effects of carbon tetrachloride when administered into the trachea and rumen of sheep.

Division of Physics to Study Solar Eclipse

Teams from six nations will observe and photograph a total eclipse of the Sun on May 30 from the 950-acre coral islet of Manuae, one of two islands previously known as the Hervey Islands group in the Cook Islands of the Pacific.

Australia's team will be Dr. R. G. Giovanelli, Chief of the Division of Physics, and Mr. D. G. Norton and Mr. E. G. V. Mugridge, also of the Division of Physics. The team will leave on 8th May.

The United States will probably send a team of 13 observers, the United Kingdom four, Russia 25, Japan 19 and New Zealand 20.

These 84 scientists will be concentrated in an area of three and a half acres on the north-east tip of the island, each nation having its own section of shoreline from which to make observations and take photographs.

Most of the expeditions, including the three-man team from Australia, will fly to Manuae via Rarotonga, but the New Zealanders will travel there aboard a warship made available by the New Zealand Government.

In addition to the activities at Manuae, the eclipse will be photographed by special rockets fired from Rarotonga, high-flying aircraft operating from Tahiti and a balloon sent up from an American ship.

These measures will ensure photographs being obtained should low cloud interfere with ground observation.

The eclipse will begin at 10 a.m. local time on May 30 (8.21 a.m. Australian Eastern standard time on May 31) and will finish 2 hours 37 minutes later, the total phase occupying but 3 minutes 43 seconds.

Manuae is one of the few suitable places in the world from which to observe and photograph this eclipse.

The eclipse will not be seen in Australia. It will start just west of New Zealand at sunrise, will sweep right across the Pacific and finish on the coast of Peru.

1965 is known to astronomers as "the year of the quiet sun" because this year the sun displays its minimum activity.

This is in marked contrast with IGY year (1957-1958), during which the Sun was at its maximum activity and studies of the Sun and the effects of solar activity on radio communications were made throughout the world.

This year's expedition to Manuae is designed to provide data as to what happens in a total eclipse when the Sun is quiet.

This will be of value from many viewpoints, but particularly with relation to radio communication and in providing a test of Einstein's theories.

Obituary

Mrs. I. F. Gilderdale of the Australian Scientific Liaison Office in London died on 12th March after a period of illness.

Mrs. Gilderdale, who joined the A.S.L.O. staff in 1946, retired last August because of ill-health, although she had hoped to continue until her sixty-fifth birthday last month.

Over the years she provided a valuable service for officers throughout the Organization by locating and photocopying hard-to-obtain scientific papers and documents.

She was a cheerful and well-liked member of the A.S.L.O. staff and will be missed by her many friends in the London office.

HONOURS

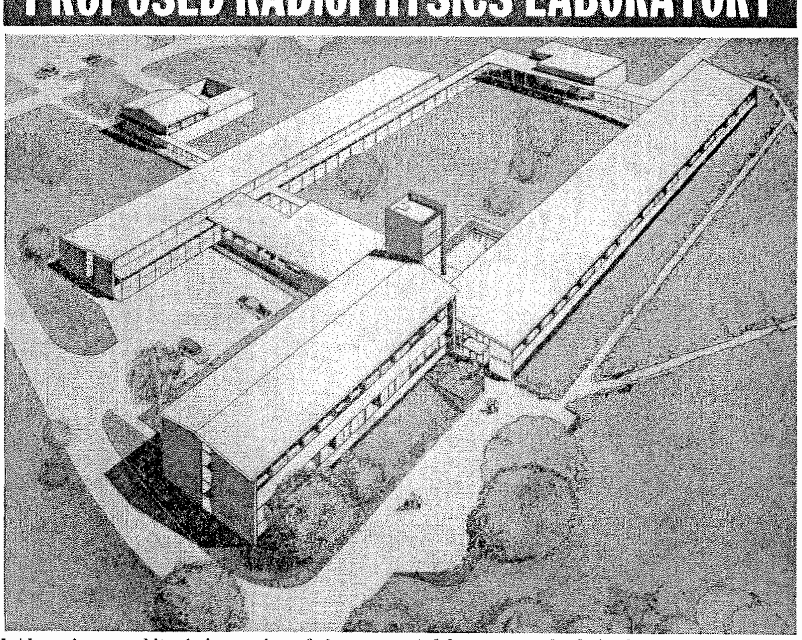
Fellow

Dr. I. W. Wark of the Executive has been elected a Fellow of University College, London. Dr. Wark holds the Ph.D. degree of the University of London, of which University College is a constituent part.

Associate

The University of Sydney Senate has appointed Dr. H. J. Frith, Chief of the Division of Wildlife Research, Honorary Associate of the School of Biological Sciences for 1965.

PROPOSED RADIOPHYSICS LABORATORY



Above is an architect's impression of the proposed laboratory to be built for the Division of Radiophysics at Epping, Sydney. The new laboratory will be mainly of single-storey construction with a two-storey wing. It will have a floor area of about 71,500 square feet including workshop and service space. The main building complex will consist of two laboratory wings on either side of a courtyard linked by a photography and test laboratory area. The courtyard will be bounded on the fourth side by a canteen. The estimated cost of the building, workshops, and site development charges is £800,000.

POSITIONS VACANT

The following vacancies for professional appointments are current:—

EXPERIMENTAL OFFICER (E.O. 1/2) Chemist (Plant Analyst) — Division of Tropical Pastures. 850/228 (May 14).

RESEARCH SCIENTIST (R.S./S.R.S.) Post Doctoral Fellowship — Division of Protein Chemistry. 462/222 (May 14).

RESEARCH SCIENTIST (R.S./S.R.S.)—Division of Organic Chemistry. 606/50 (May 14).

RESEARCH SCIENTIST (R.S./S.R.S.) — Division of Entomology. 180/310 (May 21).

LIBRARIAN (Grade II or III) — Western Australian Regional Laboratory. 530/82 (May 14).

RESEARCH SCIENTIST (R.S./S.R.S.) — Division of Entomology. 180/307 (May 14).

EXPERIMENTAL OFFICER (E.O. 1/2) (Veterinary Officer)—Division of Animal Health. 201/247 (June 11).

EXPERIMENTAL OFFICER (E.O. 1/2) (Organic Chemist) — Division of Coal Research. 480/479 (May 14).

EXPERIMENTAL OFFICER (E.O. 1/2) — Division of Mineral Chemistry. 601/31 (May 14).

Impressions of Moscow

I arrived in Moscow on a Russian jet plane direct from London at 9 p.m. on Tuesday, October 27th. The Intourist agent met me and took me by car to the Hotel Metropole, which was a bit old-fashioned and pompous but very comfortable.

The next morning Dr. Ossipjan and Dr. Kushnir fetched me from the Hotel. We walked in the neighbourhood of the Hotel which is in the centre of town on the Karl Marx Place with a huge monument of Marx facing the Bolshoi Theatre.

We saw the old University, part of the Kremlin, the new Lenin Library, the old department store (GUM), hotels, the Intourist Office Building, and the Exhibition Building which served the Tsar for horses and carriages and has no columns inside (the roof is entirely supported from the outside).

The first impression of Moscow was that life appeared to be much more "normal" than I had expected. Girls wore stiletto heels and colourful scarves (just as in London and America on windy days). Men wore ties and hats, though some wore dark shirts without ties, and caps (just as in Birmingham and New York).

There seemed to be plenty of food in the shops. On the other hand, the display of food was poor and the shops looked drab, similar to the poorer parts of London (the fact that it was the end of October may have contributed to this impression).

People seemed to be well fed and looked healthy. They laughed and made jokes and gave the general appearance of being happy (more so than in Prague where, on the other hand, there were more consumer goods in the shops).

After lunch at the Hotel, we were taken by car to Professor Vavilov of the Lebedev Physics Institute.

We drove in a Russian car very similar to the Holden along wide avenues via the University (6,000 students and some members of staff live in the central building with the famous tower).

The streets were free of litter. I understand that the driver of a dirty car can be fined.

The Physics Institute, like the other two Institutes I saw, was rather old, with dark staircases and corridors.

On the other hand, the laboratories were normal, though perhaps a little crowded.

All the equipment I saw was either made commercially in various Russian cities or designed in the laboratory workshop. There were Russian and Japanese electron miscroscopes.

By Dr. W. Boas, Chief of the Division of Tribophysics, who spent three days in Moscow last October.

At 5 o'clock Professor Vavilov took me to his home on the fourth floor of a new block of flats. I met his family and we had coffee, chocolate cake, fruit cake and, of course, Armenian brandy which is drunk in one go like vodka.

On Thursday morning at 9.15 I was met at the Hotel by my interpreter, Miss Larissa, about 25 years old, who was working for Intourist from 9 to 5 and studying languages part-time. She spoke English with a strong American accent, since she usually showed Americans around.

We walked through the Kremlin Museum, the Mausoleum (Lenin's Tomb), various churches, the Red Square, and finally back to the Hotel where I had lunch.

Being a tourist I was allowed to jump the queue at Lenin's Tomb and we queued only for about 15 minutes, the normal time being about an hour. This is the normal procedure for tourists with a guide.

At 1.30 p.m. Dr. Kushnir fetched me from the Hotel and took me by trolley-bus (no conductor, one fare for any distance) and "metro" to the Institute of Crystallography.

The "metro" was clean, well designed, well lit, with beautiful stations in the city and more uniform ones in the suburbs. Particularly striking was the absence of advertisements which gave more prominence to the beautiful light effects, mosaics and general architectural design. There were escalators everywhere.

At 5 p.m. I was taken to Vavilov's house for a meal — caviar, Armenian brandy, ham, bread and butter, pancakes to be filled either with caviar or with mushrooms (from glass houses near Moscow), a variety of lovely cheeses, coffee and a glorious home-made cake.

We then hurried off in a taxi to the beautiful modern concert hall in the Palace of Congress in the Kremlin for a concert by a group from the Moldaver republic. It was a programme of singing, dancing and folk music.

The next morning Miss Larissa fetched me from the Hotel. We went first to a big department store to buy some records, the one item which is really cheap in U.S.S.R.

We then visited the Tretjakov Art Gallery; this contains pictures painted by Russians from mediaeval times up to the modern Soviet painters — all quite interesting but not exciting since the painters followed the European style right through impressionism without any startling originality.

In the afternoon I had a long discussion about science in industry with Academician Kurdjumov and several other scientists.

We had some very frank words about their economic system and our own which showed that since one has to deal with human beings who are apt to make mistakes, no system is ideal and both meet very similar problems.

I then visited the laboratories and talked to many of the scientists (in English and German); they were all keen to meet me and talk about their work and they were proud of their knowledge of the foreign language.

Scientists are, of course, a privileged class and they were the only people to whom I talked individually (including their families) and in groups.

In the discussions, both in the laboratories and privately, they were perfectly frank about their present and future scientific work, about politics and measures taken to improve, for instance, production in general and the applications of science to industry.

There was no hesitation in criticizing government measures and red tape and admission of mistakes made.

The attitude may best be characterized by quoting the words of a Russian during one of our round table discussions: "Why shouldn't we make mistakes? After all, we have had only about forty years' experience to make our system work whereas you have had 150 years' experience with your system and still make mistakes. But we are learning, from our experience and from yours."

That evening I went with Kurdjumov and his wife to the Bolshoi Theatre where we saw a brilliant performance of Rimsky-Korsakov's "The Tsar's Bride".

The audience was well dressed but not elegant and the complete absence of costume jewellery on the ladies' dresses was striking.

After coffee and cakes at the National Hotel, the Kurdjumovs took me home to my hotel and the following morning I left for Vienna.

SAFETY NOTES

Although much publicity is given to the dangers of electricity, there are three times as many deaths from accidental poisoning as there are from electrocution.

In the U.S.A., where all cases of poisoning are notifiable, over 800,000 cases are reported every year — almost 0.5 per cent. of the population.

Unfortunately, young children are all too often the victims of accidental poisoning. The great variety of new cleansers, detergents, solvents, insecticides and polishes, has increased the hazards. Because these substances are so widely advertised and so freely available, parents are often ignorant of the danger.

As a result of a recent survey, it is estimated that one child in every 130 between one and three years of age will accidentally swallow poison.

The survey found that poisonings provide about one-half of all child accidents.

Of these poisonings, nine out of ten involve children under five years, and of these three-quarters are under three years.

At least two-thirds of the fatalities could have been prevented.

In 80 per cent. of the cases the persons concerned were not unduly careless so much as thoughtless or ignorant of the toxicity of the substances for children.

The survey also found that the most common poisons were kerosene, arsenic and strychnine.

Without exception the poisons were provided for the children by adults.

The poisonings were mostly due to the action (or perhaps inaction) of adults.

The following precautions can do much to reduce the risk of accidental poisoning in your household.

Do not store poisons in containers normally used for food.

Keep poisons out of reach of children and in a safe place. Don't forget the hazards in the garage and tool shed — kerosene, turpentine, and pesticides, and the containers they came in.

Do not take medicine in front of young children and do not refer to medicinal capsules and tablets as lollies.

Do not dispose of left-over medicines in the rubbish bin.

Flush the residue down the sewer and wash out the bottle before consigning it to the garbage.

You're probably not the kind of person to leave a poisoned bait out for a cat or a dog — why leave one out for children?

J. W. Hallam, Safety Officer.

INSTITUTE MEDAL

Mr. C. S. Andrew of the Division of Tropical Pastures has been awarded the Australian Medal of Agricultural Science for 1965 for his work in plant nutrition.

The medal is awarded annually by the Australian Institute of Agricultural Science and Mr. Andrews is the third member of the Division to receive the medal since it was struck in 1948. The other two medallists are the Chief, Dr. J. Griffith Davies, and Dr. D. O. Norris.

From 1952 to 1957 Mr. Andrews was a member of the team which solved the problem of low soil fertility in the wallum country of Queensland.

More recently, he has made most important advances in knowledge of the nutrient needs of a wide range of tropical legumes and grasses. He has pioneered crop logging (on the spot mineral analysis in the field) for tropical pastures.

This is the first time such a system has been applied to pastures anywhere in the world. Previously it had only been applied to sugar cane, sugar beet, tobacco and other short-term crops.

One of Mr. Andrews' techniques in plant culture aroused so much interest among scientists around the world that reprints of the paper describing it became a scientific "best seller". A further printing had to be made to meet the demand.

Photographed by Eric Smith, Division of Building Research.

"Nothing like a cigarette to clear the head."

IS THERE ANYBODY THERE?

Last month Russian radio-astronomers announced the discovery of periodic variations in the intensity of radio waves from a distant radio source. This they claim suggests the possibility that the distant source is inhabited by intelligent beings.

The source, which is known as CTA-102 was first discovered about five years ago by Dr. J. A. Roberts of the Division of Radiophysics.

Dr. Roberts was at the time working at the California Institute of Technology with another officer of the Division, Mr. J. Bolton.

Further research at Caltech a few weeks ago resulted in the identification of CTA-102 with a visible heavenly body.

CTA-102 is a quasi-stellar radio source of a most unusual kind. Only three or four similar bodies are known.

The discovery of variations in wave intensity with a periodicity of 100 days is a new discovery and no certain explanation of the phenomenon can be given at present.

However, most of the world's radio - astronomers including those at the Division of Radiophysics see no reason to attribut this unusual feature to intelligent beings.

News in Brief

Doctorates

Mr. F. K. McTaggart of the Division of Mineral Chemistry has been awarded the degree of Doctor of Science by the University of Melbourne for his published work on the chemistry of titanium, zirconium and hafnium.

Miss J. M. Bain of the Division of Food Preservation has been awarded the degree of Ph.D. by the University of Sydney for research on the physiology of ageing in plant tissues.

Review Prize

Mr. C. T. Gates of the Division of Tropical Pastures has been awarded a special £50 prize by the Australian Institute of Agricultural Science for the best review article published in the Institute Journal during 1964. Mr. Gates' article was concerned with the effect of water stress on plant growth.

Adviser

Professor R. N. Robertson, Professor of Botany at Adelaide University and a former Member of the Executive, has been appointed Chairman of a committee which will advise on the allocation of £1 million in research funds among individuals and teams under the Federal Government's new programme of aid for tertiary education.

Vice-Chancellor

A former CSIRO Chief, Professor David M. Myers, has been appointed Vice-Chancellor of La Trobe University, Melbourne. Professor Myers, who was Chief of the Division of Electrotechnology from 1939 to 1949, is at present Dean of the Faculty of Applied Science and Professor of Electrical Engineering at the University of British Columbia, Vancouver.

Resignation

At a farewell gathering held in her honour last month at the Canberra home of Mr. C. S. Christian, Miss Gladys Munro was presented with a pearl necklace and ear-rings by Professor G. M. Badger. Miss Munro was resigning, after nearly thirty years with CSIRO, to join the Prime Minister's personal staff. She was Secretary to the late Sir Ian Clunies Ross from 1946 until his death in 1959, and in the last few years has been Secretary to several members of the Executive.

Cloud Physics Conference

Six officers from two Divisions will attend the Second International Cloud Physics Conference which is being held in Tokyo from 24th May to 1st June. They are Dr. E. G. Bowen, Chief of the Division of Radiophysics; Mr. E. E. Adderley, Dr. S. C. Mossop, Mr. J. W. Telford, and Mr. J. Warner, all of the Division of Radiophysics; and Mr. L. F. Evans of the Division of Physical Chemistry. The First International Cloud Physics Conference was held in Canberra and Sydney in 1961.

Advisory Council Meeting

The Advisory Council will meet in Sydney on the 18th and 19th of this month. During the first day Council members will visit the National Standards Laboratory to see something of the work of the Divisions of Physics and Applied Physics. Much of the second day will be taken up with discussions on the respective roles of the universities and C.S.I.R.O. in scientific research in Australia, and on building research and the building industry.

Power Conference

The Institution of Engineers, Australia, is holding a conference on "Power Production and Energy Conversion" in Sydney in November, 1966.

Authors are invited to submit papers in such areas as nuclear energy, solar energy, magneto-hydro-dynamics, fuel cells, thermoelectric and thermionic conversion, combustion systems, conventional power stations, and automotive and marine power plants.

Papers which are accepted will be preprinted in one volume for circulation in advance to those who will be attending the Conference. Following the Conference they will be published with discussion. The suggested length is 4,000 to 5,000 words.

Prospective authors are asked to contact the Secretary of the Institution of Engineers, Australia, Science House, 157 Gloucester Street, Sydney.

Gliding Champion

Mr. D. Reed of the Division of Meteorological Physics will be one of four Australian pilots taking part in the World Gliding Championships at South Cerny, England, from May 22nd to June 13th. He will be competing with pilots from more than twenty countries. The Australians are taking two gliders with them and will borrow another two in England.

Barn Dance

A "Woolshed Hop" at the Glenthorne Experimental Station of the Division of Biochemistry and General Nutrition was a great success with CSIRO staff in Adelaide last March. Highlights of the evening included a skit, "Arbitration 1984", and a series of symphonies performed by the Nutrition Orchestra — "The Bleatles". The evening proved so successful that the Farm Manager, Mr. Ralph Jones, has been asked to delay shearing next year until after the 1966 "Woolshed Hop".

Housing Project

The Public Servants' Co-operative Community Advancement Society Ltd. has launched its second housing project in the Melbourne suburb of Armadale.

A block of twenty-four separate-title one-bedroom flats is being built at 48 Sutherland Road, near Armadale Station. The flats will be available to Society members by December.

Price of the flats is from £3,725 with £600 deposit and the balance over 15 to 28 years from £4 weekly at 5¼ per cent. reducing interest.

All members of CSIRO staff resident in Melbourne are eligible for membership of the Society. Further details may be obtained from the Society's Manager of Projects, Dr. F. O. Tamas (telephone 82 2886).

Photograph R.A.N.

BEATING THE BARNACLE

In the fifth century B.C. a mixture of arsenic, oil and sulphur was used to protect ships against the barnacle and its allies.

Today fouling is prevented by the use of paints containing metallic compounds that are poisonous to the fouling growths. The commonest of these compounds is cuprous oxide.

Unfortunately these anti-fouling paints accelerate the corrosion of ships' hulls and so it is usual to apply them over anti-corrosive paints.

But in spite of improvements in anti-fouling paints it is still necessary for most ocean-going ships to be scraped of barnacles and repainted every two years.

However, a new anti-fouling-anti-corrosive system developed by Mr. H. B. Wisely of the Division of Fisheries and Oceanography in co-operation with the Royal Australian Navy and commercial firms may enable ships to sail for five, ten or even more years without docking.

The new system has given extremely promising results in tests so far.

The anti-corrosive layer consists of a solventless epoxy resin which is applied directly to the cleaned hull.

The cuprous oxide anti-fouling paint is applied over this resin layer.

Since the anti-fouling paint is of a type that dissolves slowly in sea-water, its effective life is expected to be roughly proportional to the number of coats applied.

Our picture above shows anti-fouling paint being applied to a ship's hull over an epoxy-resin coating.

Overseas Visits

Dr. K. M. Alexander of the Division of Applied Mineralogy will leave Australia in the middle of the month for North America, Britain, Europe and Japan where he will visit cement and concrete research establishments, and industrial projects. He will be away for four months.

Dr. L. A. T. Ballard of the Division of Plant Industry left last month for North America, Europe, Britain, Israel and Ceylon where he will visit a number of agricultural research centres and seed testing stations. He will also take part in the XIVth Conference of the International Seed Testing Association which will be held in Munich later this month. Dr. Ballard will return to Australia in August.

Mr. D. E. Bland of the Division of Forest Products left recently for Europe, Britain, the United States, and Canada where he will visit a number of research centres concerned with wood chemistry. Mr. Bland will also attend a training course on the use of radio-isotope techniques in forest research in Hanover. He will return to Australia in August.

Mr. W. K. Clothier of the Division of Applied Physics left last month on a three month visit to research laboratories in North America, Britain, Europe, Israel, India and Japan.

Mr. G. B. Gresford returned recently from Paris where he attended the Third Session of the U.N. Advisory Committee on Science and Technology. While overseas he also visited the Australian Scientific Liaison Office, London, and the Office of the Scientific Attaché to the Australian Embassy, Washington.

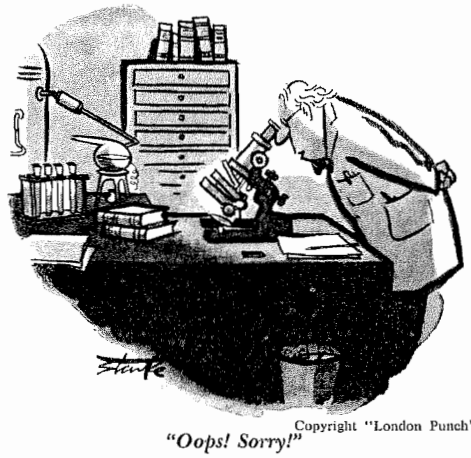
Mr. B. V. Hamon of the Division of Fisheries and Oceanography left last month on a ten week visit to the United States, Britain, Europe, Canada and New Zealand, where he will have discussion on the development of oceanographic instrument buoys.

Mr. J. A. Mabbutt of the Division of Land Research and Regional Survey left early this month for South Africa, Nigeria, Europe, Britain and the United States, where he will visit centres engaged in geomorphological work. He will also attend the VIIth International Congress of the Association for Quaternary Research, Colorado, and will carry out a field study of arid landscapes in the United States before returning to Australia in October.

Mr. T. Pearcey of the Computing Research Section will leave later this month for the United States, Britain, and Germany where he will visit computing research centres. He will return early next August.

Dr. H. R. C. Pratt, Chief of the Division of Chemical Engineering, will leave shortly for overseas where he will visit research centres and chemical firms in Japan, Britain and India. He will be away for three months and will attend the Joint Meeting of the Institute of Chemical Engineers with the American Institute of Chemical Engineers in London, and the XXth I.U.P.A.C. Congress in Moscow.

Mr. M. B. Smith of the Division of Food Preservation will leave early this month for the United States, Britain and Europe where he will visit research centres concerned with the physical chemistry of proteins. He will be away for about seven weeks.



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"Oops! Sorry!"

APPOINTMENTS TO STAFF

Dr. N. Anderson has been appointed to the Division of Animal Health where he will initiate a study of sheep and cattle helminth infections in Southern Australia and collaborate in investigations into the inter-relationships of certain virus infections of livestock and infection with helminths. Dr. Anderson will take charge of a new section of parasitology. After graduating B.V.Sc. from the University of Sydney in 1959 he went into private practice, firstly in Victoria and then in England. In 1961 he became House Surgeon to the Professor of Veterinary Medicine at Glasgow University. He was appointed Assistant Lecturer in Veterinary Medicine at the University in 1962 and has since been carrying out research on bovine ostertagiasis for his Ph.D.

Dr. D. E. Bottrill has been appointed to the Horticultural Research Section where he will undertake biochemical studies of the function of nutrient elements in plant growth and

Dr. D. E. BOTTRILL

metabolism. Since graduating B.Ag.Sc.(Hons.) from the University of Adelaide in 1961, Dr. Bottrill has been at the University of Illinois where he recently obtained his Ph.D. for work on the effects of 2,4-D on maize plants.

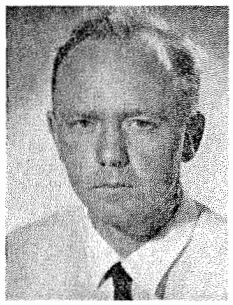
Mr. K. D. Casperson, who graduated B.Sc.(Hons.) last year from the University of British Columbia, has joined the Division of Wildlife Research where he will take part

Mr. K. D. CASPERSON

in research on the ecology of the wild rabbit. He will be engaged initially on a study of feeding behaviour and the effect of rabbit grazing on pastures.

Miss M. E. Garling has been appointed to the Division of Textile Physics where she will investigate techniques of measuring fibre fineness as part of the Division's yield testing programme. Miss Garling recently graduated B.Sc.(Hons.) from the University of New South Wales.

Mr. D. Culpin, who graduated B.Sc.(Hons.) from the University of Sydney last year, has been appointed to the Division of Mathematical Statistics. He will assist with statistical aspects of the re-



Mr. D. CULPIN

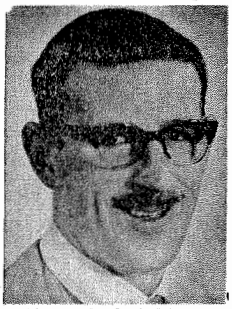
search programme of the National Standards Laboratory and the Division of Textile Physics.

Mr. S. C. Goadby has been appointed to the Division of Coal Research where he will study the development and application of X-ray diffraction and emission techniques in investigating the inorganic constituents of coals and the related substances formed at high temperatures. Mr. Goadby

Mr. S. C. GOADBY

graduated B.Sc.(Hons.) from the University of London in 1953 and spent the following eight years as an industrial chemist with the chemical manufacturing firm of Whiffon and Sons Ltd., England. Since then he has been working with the Bureau of Mineral Resources, Canberra.

Mr. A. D. L. Hooper has been appointed to the Division of Land Research and Regional



Mr. A. D. L. HOOPER

Survey where he will take part in the Division's soil investigations both in the laboratory and in the field. Mr. Hooper graduated B.Sc. from the University of Canterbury, New Zealand in 1958 and M.Sc. from the same University in 1962. During 1958 and 1959 and for part of 1962 he worked for the New Zealand Forest Service on botanical and soil surveys in the Southern Alps, and in 1960 and 1961 he taught with the New Zealand Education Department. Mr. Hooper recently spent two and a half years in the Labuk Valley of central Sabbah as a member of a United Nations Soil Survey team.

Mr. J. R. Hales has been appointed to the Division of Animal Physiology where he will assist in a study of respiratory evaporation and heat regulation in farm

Mr. J. R. HALES

animals. Mr. Hales graduated B.Sc.(Hons.) from the University of New England in 1963 and since then has been reading at the University for his M.Sc.

Dr. N. A. McKinnon has been appointed to the Division of Applied Mineralogy where he will work with the leader of the Engineering Ceramics Section. After graduating B.Sc. from the University of Melbourne in 1943, and M.Sc. from the same university in

Dr. N. A. McKINNON

1945, Dr. McKinnon joined the Aeronautical Research Laboratories. In 1951 he went to Britain to work at the Atomic Energy Research Establishment, Harwell. In 1952 and 1953 he worked at the University of Birmingham on the distribution of slip in the interior of single crystals of aluminium-silver alloys. After returning to Australia he expanded this work to a general optical and X-ray metallographic study of deformation and consequent work hardening of aluminium and its alloys. He was awarded a Ph.D. for this work in 1960 by the University of Birmingham. From 1960 to early 1962 he led a group at the Aeronautical Research Laboratories which provided a defect investigation service for the R.A.A.F. and the Department of Civil Aviation. Since 1962 Dr. McKinnon has been Physical Sciences Representative of the Department of Supply at Australia House, London.

Dr. D. W. Robinson has been appointed to the Division of Land Research and Regional Survey where he will carry out research on beef cattle nutrition and husbandry at the Kimberley Research Station. Dr. Robinson graduated B.Sc. (Hons.) from the University of Nottingham in 1959. He obtained his Ph.D. from the same university in 1962 for a thesis on the protein and energy nutrition of the bacon pig. Since 1962 he has been Lecturer in Animal Nutrition at the University of Liverpool and has been conducting research on the absorption and digestion of amino acids in the pig and on the use of anabolic steroids in animal production.

Mr. D. E. Shaw, a recent science graduate from the University of Sydney, has been appointed to the Division of Mathematical Statistics and will assist with statistical

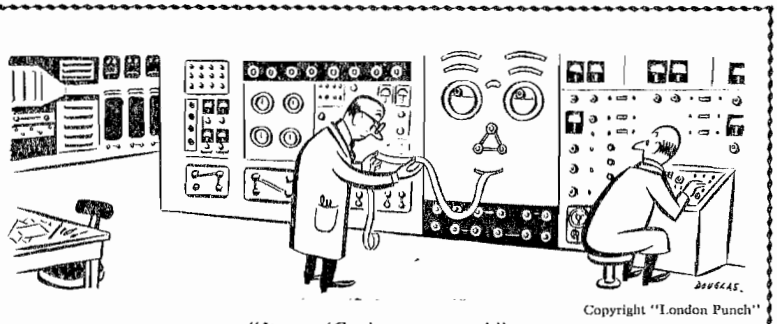
Mr. D. E. SHAW

aspects of the research programme of the National Standards Laboratory.

Mr. J. S. Wells has been appointed to the Industrial and Physical Sciences Branch at Head Office where he will assist with the general liaison activities of the branch. After graduating B.E.E. from the University of Melbourne in 1945, Mr. Wells spent a year in the Patent Department of Philips Electrical Industries Pty. Ltd. From 1946 to 1962

Mr. J. S. WELLS

he was employed by Commonwealth Industrial Gases Ltd., initially as Research and Development Engineer, later as Sales Engineer, and finally as Manager of Sales Technical Service. Since then he has been Officer-in-Charge of the Light and Electrical Engineering Section of the Department of Trade and Industry.



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"It says 'Cogito ergo sum.'"

Britannica Awards

Encyclopaedia Britannica Inc. makes annual awards in Australia in recognition of outstanding contributions associated with Australia in five separate fields of human endeavour. These Britannica Australia Awards are aimed at the advancement of Art, Education, Literature, Medicine and Science.

The Award in each nominated field will be made for a contribution or development of outstanding merit originating in Australia, or having direct connection with or benefit for Australia.

The Committee for the Natural and Applied Sciences is concerned with the following disciplines — Mathematics, Physics, Chemistry, Biology and Applied Science, and invites nominations of persons who have made outstanding contributions of the kind described above and of contemporary importance.

The Award is open to scientists whose relevant work has been carried out mainly in Australia. It is also open to Australians whose relevant work has been done mainly abroad, provided in these latter cases that the work has special significance or value to Australia, or is connected with some aspect of Australian life.

Each nomination should be accompanied by a citation justifying the nominee's claim for consideration by the Committee with reference to his principal achievement or field of achievement.

A list of the nominee's publications should also be included, with an indication of those specially relevant to the citation.

Each Award will consist of a gold medal, a diploma bearing a citation and £A5,000.

Unsuccessful nominations for the 1964 Award will be automatically reconsidered by the Committee in connexion with the 1965 Award, and nominators are invited to submit, before the 1st August, 1965, a note of any relevant new achievements since their original nominations were made in 1965.

Twelve copies of each nomination and supporting material should be lodged with the Chairman of the Committee, c/- The Australian National University, Box 4, P.O., Canberra, A.C.T., before 1st August, 1965.

The Committee will not consider nominations made by any person on his own behalf.

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CORESEARCH

FOR CIRCULATION AMONG MEMBERS OF CSIRO STAFF — NUMBER 75, MELBOURNE, JUNE 1965

CSIRO AND THE UNIVERSITIES

At the CSIRO Advisory Council meeting in Sydney on May 18th and 19th, a whole morning was devoted to a discussion of the respective roles of CSIRO and the universities in scientific and industrial research.

In leading off the discussion, Dr. J. A. L. Matheson said that it was now becoming accepted that university staff should devote half their time to research. A university's first objective was to teach. To teach well, academics should be involved in research as a creative intellectual activity. The discovery of new knowledge for them should be a by-product, a secondary reason for engaging in research.

The advantage of the present system was that CSIRO laboratories had become repositories of considerable knowledge in the problems of certain topics and industries. The interests of university departments were more unstable and likely to change completely with the appointment of a new professor.

Dr. Matheson believed that many CSIRO researchers would benefit from the stimulation of contact with students.

He pointed out that there was already considerable co-operation between CSIRO and the universities. What was needed was more co-operation at the personal, individual level.

Professor V. M. Trikojus said that there should be better facilities for interchange of staff between CSIRO and the universities. Unfortunately superannuation commitments inhibited this.

He advocated better facilities for allowing temporary secondment of CSIRO people to universities for a year or two. Similarly, university people should be enabled occasionally to spend a year in a CSIRO laboratory, not to count as sabbatical leave.

There was a good case for CSIRO locating small research groups within university departments for a few years at a time. This would broaden the interests of both the staff and students of the department.

CSIRO and the universities might well co-operate in the training of research technicians, of which there was a growing shortage.

Professor Trikojus also advocated the creation of a national advisory committee on scientific policy. It was difficult to effect needed reforms when the scientific community spoke to the Government with several voices.

Professor Badger said that there were two notable differences between CSIRO and university research. The choice of topics in a university was freer, since the applicability of results was not a necessary criterion.

Secondly, university research was geared to the Ph.D. programme, and topics had to be sub-divisible into units which could be handled by one man in three years. Moreover, results had to be attainable, which discouraged highly speculative research.

Professor Badger believed that more CSIRO officers would like to engage in part-time teaching and would welcome invitations.

Ph.D. students should have the opportunity to work for their degrees in CSIRO establishments. This had been opposed because it might weaken the graduate schools, but it was more likely to relieve the congestion in many of them. The output of Ph.D.'s was doubling every four years.

He concluded by saying that CSIRO was an ageing organization, and would profit from the temporary presence of more young minds. A post-doctoral fellowship programme might achieve this.

Mr. H. Weber disagreed with Professor Trikojus about national science policy co-ordination. He would like to see universities retain independence in this regard.

CSIRO on the other hand, might do more directed research. There was a need to examine more carefully the likely profitability of research programmes.

Sir John Eccles advocated throwing CSIRO open to Ph.D. students. It would not weaken the graduate schools, and the experience of the Institute of Advanced Studies at Canberra had proved this.

CSIRO staff could become honorary officers of the universities and supervise the work of graduate students.

Dr. J. R. Price suggested that subject Divisions (like Organic Chemistry) might be converted to research institutes and that university people might share in their supervision. Financed by CSIRO, they could be guided by committees nominated by the Executive and the Academy.

Students could work for their Ph.D.'s in such institutes. His own Division had taken a small step in this direction by inviting university men to serve as consultants to the Division.

Sir Samuel Wadham thought too much attention was being paid to Ph.D. training. He suspected that there was a tendency to expand the programme without due regard to the mental equipment of candidates.

More support should be given to training technicians.

Dr. O. H. Frankel disagreed with Dr. Price's proposed means of ensuring closer CSIRO - university collaboration. He thought this would split CSIRO into a scientific half and a technological half.

On the other hand, he was attracted to Professor Trikojus' idea of locating small units in university departments.

Professor E. A. Rudd thought that university staff seldom managed to devote half their time to research. It was an ideal that was seldom reached.

He liked the idea of concentrating a lecturer's whole teaching load into one term, allowing the rest of the year for research. If the research could sometimes be done in CSIRO laboratories, all the better.

Professor Rudd observed that the initiative for closer co-operation must come from CSIRO, since it was more closely knit and coherent than the universities as a group.

Professor C. W. Emmens referred to the imbalance of disciplines in universities. Staff numbers were in proportion to teaching load, and the huge size of first year classes in physics and chemistry was responsible for an unduly high output of university research in these subjects. This sort of imbalance could be avoided in CSIRO.

Mr. C. R. Kelly said that Members of Parliament would welcome a national policy committee. Politicians had to listen to the claims of many different scientific bodies, and were confused as a result.

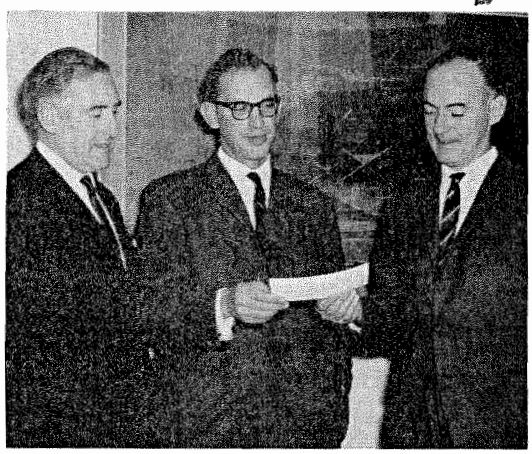
If Parliament were to support science more heavily, it needed a clearer and more articulate single source of advice.

In summing up, **Mr. H. B. Somerset** spoke of the problem of securing the adoption of research results by industry, in which the universities had even greater problems than CSIRO.

Non-transferrability of scientists was one of the most serious issues, and deserved further study.

At the end of the meeting Council agreed to appoint a committee to consider the whole matter further.

Aid For Indian Village



In a little under four months Community Aid Abroad Groups at Head Office and the Division of Forest Products have raised £250 to assist people in the Indian village of Rupabad.

This money, together with contributions from local Indian Government and private organizations, will be used to help in the sinking of a well for irrigation, the purchase of seed and fertilizers, the provision of housing for village poor and the purchase of working bullocks.

The next goal which the Head Office and Forest Products Community Aid Abroad Groups have set themselves is to raise £440 for a poultry unit at Madras Christian College Farm.

The unit will be used to train students in poultry husbandry and to provide a reliable source of better quality food.

The project will be supervised by a New Zealand agricultural scientist Mr. J. Hayman.

Madras Christian College has produced many prominent Indian leaders in politics and in the professions, and has had a number of contacts with Australia and New Zealand, mainly through teachers from these countries working on the staff of the College.

Our picture above shows the Director of Community Aid Abroad, Mr. D. Scott (right), receiving the cheque for £250 from the Chairman of the Head Office C.A.A. Group, Mr. L. Peres (centre), and the Treasurer of the Group, Mr. M. Combe.

Below. Last month's Advisory Council meeting included a visit to the National Standards Laboratory. Here Mr. W. R. Blevin (left), of the Division of Physics, demonstrates work on the illumination of pedestrian crossings to Advisory Council members Mr. W. J. D. Shaw and Sir Arthur Coles and to the Acting Chairman, Dr. I. W. Wark.

PARIS CONFERENCE

More than two hundred and fifty textile research workers from some twenty countries will meet in Paris at the end of this month to exchange ideas and report progress in the study of the wool fibre.

The occasion for this will be the 3rd International Conference on Wool Textile Research to be held from 29th June to 9th July.

Previous conferences have been held in Australia in 1955 and in England in 1960.

The present meeting is being organized by the Institut Textile de France under the auspices of the International Wool Textile Organization and the International Wool secretariat with the support of the French Central Wool Committee.

CSIRO will be sending a strong delegation to the Conference.

Those going include the Chairman, Sir Frederick White; Dr. F. G. Lennox (Chief), Mr. W. G. Crewther, Dr. R. D. B. Fraser, Dr. B. Milligan and Dr. W. E. Savige of the Division of Protein Chemistry; Dr. M. Lipson (Chief), Dr. J. Delmenico, Dr. J. R. McPhee, Dr. D. S. Taylor and Dr. G. F. Wood of the Division of Textile Industry; and Mr. V. D. Burgmann (Chief), Dr. K. Baird, Mr. M. Feughelman, Mr. D. T. Liddy, Dr. P. Nordon and Dr. I. C. Watt of the Division of Textile Physics.

The delegation will be lead by Dr. Lennox.

MR. L. J. LYNCH TO RETIRE

Mr. L. J. Lynch will retire from the Division of Food Preservation this month after some thirty years with CSIRO.

Mr. Lynch qualified as a pharmacist in 1924. A few years later he undertook an agricultural science course at the University of Queensland, graduating with honours in 1934.

He joined the Division of Food Preservation in 1935 as a citrus research officer.

During World War II, he contributed greatly to the war effort of the Australian canning industry which underwent a rapid expansion to meet the needs of the Allied Services in the South Pacific area.

Mr. L. J. LYNCH

In 1942 he became Technical Adviser to the Commonwealth Controller of Defence Foodstuffs and was sent to the United States to survey the American canning industry.

The knowledge that he gained proved invaluable to Australian canners, particularly those who were undertaking the canning of vegetables for the first time.

By methods that were aggressive or persuasive as the occasion demanded, he was virtually responsible for establishing the commercial canning of citrus juices in Australia.

Since then he has continued to minister to the technical needs of the canning industry, by advice, by assistance with day to day problems, and by research directed towards improvement of the quality of canned foods.

Mr. Lynch's personal field of research has been the chemistry and technology of green peas and his work has revolutionised the harvesting and processing of green peas for freezing and canning in Australia.

He has been vitally interested in education in food technology and was largely responsible for the establishment of the Food Technology Diploma Course at Hawkesbury Agricultural College.

He also had a particular interest in the provision of training in canning technology for students who have visited Australia under the Colombo Plan and United Nations technical assistance schemes.

In 1962 Mr. Lynch was selected for the International Award of the Institute of Food Technologists for his efforts in promoting the international exchange of ideas, and earlier this year he received the Institute's Australian Award for meritorious contributions to the advancement of food technology in Australia.

OBITUARY

Mr. A. R. Prater of the Division of Food Preservation died suddenly on March 23rd, 1965.

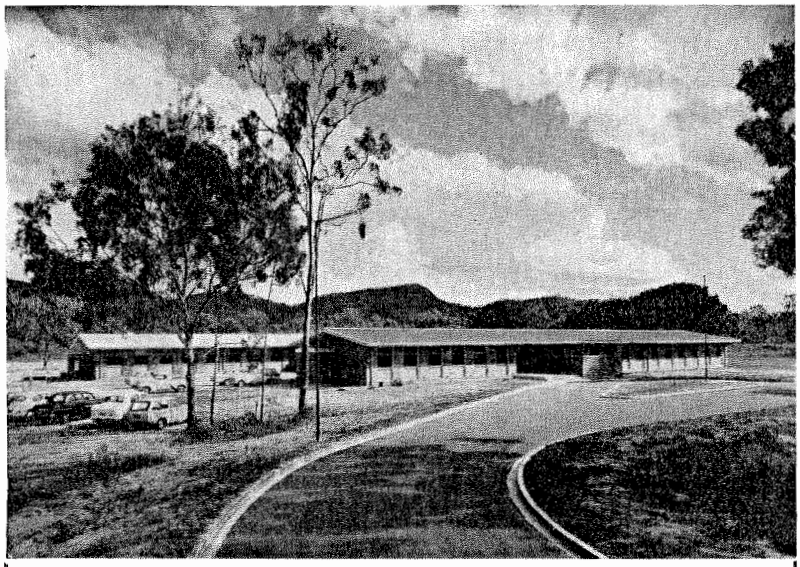
Mr. Prater, who was a graduate in Agricultural Science of the University of Western Australia, was appointed to the Division in 1943 to carry out research on dried foods, notably dried eggs and dried mutton mince, both of which were important items of diet for the Armed Forces.

In recent years Mr. Prater has been in charge of fish preservation research.

He will be missed by his many friends in the Division.

Adelaide Chief Weds

Dr. E. A. Cornish, Chief of the Division of Mathematical Statistics, and Miss Gene Goodale, until recently the Division's Administrative Officer, were married in Adelaide last month. At a party held in their honour a few days before the wedding, they were given a silver tea and coffee service by the staff of the Division. Dr. Cornish and Miss Goodale are shown above receiving the gift from Mr. G. N. Wilkinson (left).



This new laboratory for the Division of Tropical Pastures in Townsville is now nearing completion and will be opened by the Minister-in-Charge of CSIRO, Senator Gorton, next month. It has a floor area of more than 16,000 square feet and is air-conditioned throughout. The laboratory is located on a 50 acre block adjacent to the new Townsville University site at the foot of Mt. Stuart and on the banks of the Ross River.

This Month's Overseas Travellers

Mr. R. E. Belin, of the Division of Textile Industry is at present on a two months visit to Britain, Europe, the United States, Japan and India where he will visit wool textile mills, machinery makers and research institutes in connection with his research into wool combing.

Dr. A. F. Bird of the Horticultural Research Section will leave Adelaide later this month for North America, Britain, and Europe for discussions on plant nematology research. He will be absent for about three months.

Mr. D. J. Close of the Division of Mechanical Engineering left recently for the United States to take up a twelve month Research Assistantship at the Solar Energy Laboratory of the University of Wisconsin.

Mr. H. J. Griffiths of the Division of Mechanical Engineering will leave this month for overseas where he will spend ten months studying aspects of grain storage in Britain, the United States and Canada. Much of this time will be spent in Britain at the Pest Infestation Laboratory of the Agricultural Research Council. Mr. Griffiths will also visit France, India, Ceylon, Thailand, Malaya, and the Philippines before returning to Australia in June next year.

Mr. I. Langlands, Chief of the Division of Building Research, leaves later this month on a fifteen week visit to building research centres in Britain, Europe, Russia, Turkey, India, Israel, Japan and Malaysia.

Dr. J. H. Leigh of the Division of Plant Industry will leave shortly for South Africa, Israel, Spain, Britain, the United States and Mexico where he will visit research centres working in the field of semi-arid pasture development and management. He will be away for about five months.

Mr. J. J. McNeill of the Division of Chemical Physics will leave Sydney at the end of the month for Britain, Europe, and the United States where he will visit research laboratories concerned with work in high frequency spectroscopy, thin film optics and related high vacuum problems. He will also visit several establishments concerned with optical instrumentation. He will return at the end of August.

Dr. A. L. G. Rees, Chairman of the Chemical Research Laboratories, will leave Melbourne this month on a five weeks visit to Britain, France, Russia and the United States. He will attend meetings of the Executive Committee and Bureau of the International Union of Pure and Applied Physics in Paris and Moscow and will attend the Union's 23rd Conference in Paris and the 20th Congress on Pure and Applied Chemistry in Moscow. He will also visit a number of research centres in Europe and the United States concerned with the chemical physics of the solid state.

Mr. B. G. Richards of the Soil Mechanics Section will leave this month for overseas in connection with an International Symposium - in - print on moisture equilibria and moisture changes in soils beneath engineering structures. Mr. Richards will visit South Africa, Britain and North America and will be away for about twelve months.

Dr. A. Walsh of the Division of Chemical Physics leaves Melbourne this month on a four month visit to South Africa, Europe, Britain, Russia, the United States, Japan and New Zealand where he will visit a number of research centres and lecture on atomic absorption spectroscopy. He will also visit overseas manufacturers of atomic absorption equipment and will attend the IUPAC Conference in Paris and the 20th Congress on Pure and Applied Chemistry in Moscow.

SAFETY NOTES

Schuss or Indoor Tobogganing

While skiing enthusiasts in the southern States are again looking forward to another season of breath-taking downhill runs, people everywhere are faced with the sport which knows no season, indoor skating and tobogganing on polished floors.

The polished floor, whether stained natural timber, or vinyl or linoleum covered, can be found in almost all homes and commercial premises. This is no doubt due to the high initial cost of carpeting, the lower maintenance cost of polished floors, and the lesser need of floor insulation with the growing popularity of central and space heating.

Polished floors are the perfect indoor skating rink. However, the following precautions can help lower the risk of personal injury caused by slipping on polished floors.

Do not use paste or solid polishes as these types leave a thicker layer of wax on the floor and it is the wax which provides the low friction required for a skid. Liquid polishes can be spread in a much thinner layer.

Use the minimum amount of polish and a lot of mechanical polishing. Frequent buffing-up will produce a better finish than a heavy layer of wax.

Loose mats and floor rugs make excellent toboggans. Painting their backs with rubber latex will stop them slipping on polished floors, but will not affect them or the floor in any way.

Worn heels or unsuitable footwear are a major contributing factor to falls on polished floors. Make sure you are not an offender — the blame seldom rests entirely with the floor.

Excessive speed and cornering too fast causes skids, just as it does on wet roads. The corners which have to be negotiated in the home or at work are not banked like a high speed highway, so you will find it faster in the long run to travel at a moderate speed instead of racing, falling, picking yourself up and continuing on your way.

Remember, the polished floor is quite safe, provided it is properly polished and you treat it as a polished floor.

J. W. Hallam, Safety Officer.

News In Brief

Fellow

Dr. J. G. Bolton of the Division of Radiophysics has been elected a Fellow of the Australian Academy of Science.

Doctorates

Dr. C. C. J. Culvenor of the Division of Organic Chemistry has been awarded the degree of Doctor of Science by the University of Melbourne for his work on the chemistry of pyrrolizidine alkaloids in relation to liver disease in livestock.

Mr. I. J. Jarrett of the Division of Biochemistry and General Nutrition has been awarded the degree of Doctor of Science by the University of Adelaide for his work on carbohydrate and fatty acid metabolism in the ruminant.

Rennie Medal

Dr. T. Mole of the Division of Organic Chemistry has been awarded the 1964 Rennie Medal of the Royal Australian Chemical Institute.

Olle Prize

Dr. J. E. Falk, Chief of the Division of Plant Industry, has been awarded the Olle Prize by the New South Wales Branch of the Royal Australian Chemical Institute. This is the first occasion of the award.

Left Write

A book written by Dr. R. O. Slatyer of the Division of Land Research and Regional Survey and Mr. I. C. McIlroy of the Division of Meteorological Physics has just been published in Russia.

The book—a manual on practical microclimatology was prepared for UNESCO in 1961. Originally it was thought that the manual would be of most value to scientists in developing countries where library facilities were poor; however, the greatest demand came from scientists in highly developed countries concerned with micrometeorology and physical aspects of soil and plant science.

As a result, the thousand copies that were prepared were quickly distributed and there has since been a considerable pressure for a new edition.

Dr. Slatyer learnt recently that a Russian translation of the book had just appeared and that 10,000 copies had been printed in the U.S.S.R. "This probably makes a new English edition unnecessary," he said, "since the United States is now almost certain to translate the book back into English and print numerous copies."

Made The Grade

Professor G. M. Badger, Ph.D., D.Sc., F.R.I.C., F.R.A.C.I., F.A.A., and President of the Royal Australian Chemical Institute has been awarded his Diploma of Applied Chemistry by the Gordon Institute of Technology, Geelong.

Professor Badger attended the course in applied chemistry at the Gordon Institute in 1932-34 but did not acquire the requisite practical experience until his period of employment with I.C.I. during 1941-43. The diploma was awarded to Professor Badger last April when he attended a function at the Gordon Institute as guest speaker.

Film Award

The Film Unit last month received a silver award in the 1965 competition of the Australian Film Institute for its film "Approach to Science".

The film, which was entered in the teaching section, is aimed at showing young people the nature of scientific research. It was commended "for its dramatic presentation of scientific method".

Public Relations

CSIRO has now received three mentions on the Mavis Bramston Show.

Housewives' Choice

About forty housewives chosen at random in the Chelmer-Graceville area of Brisbane are being given two choice steaks twice a week over a four week period. The only condition is that the housewife cooks the steak, serves it to her husband and herself, and reports on its quality to the Division of Food Preservation.

This is believed to be the first consumer study of this kind undertaken in Australia. It will continue until the end of November by which time up to one hundred families in different suburbs will be receiving free steaks at the one time.

The aim of the survey is to see what type of beef domestic customers want and whether this can be produced by research in breeding and feeding.

The leader of the survey team is Professor H. D. Naumann of the Department of Animal Husbandry at the University of Missouri who is spending nine months with the Division of Food Preservation as a Fulbright Scholar.

Our picture below shows Dr. Slatyer holding both the soft-covered original of "Practical Microclimatology" and the hard-covered Russian translation.

VISITOR FROM CHINA

Four scientists from the Academica Sinica, Peking, recently spent a month in Australia as guests of the Australian Academy of Science. They were Professor Yin Tsan-Hsun (Director of the Department of Earth Sciences); Professor Wang Yu (Deputy Director of the Institute of Organic Chemistry); Professor Yen Tung-Sheng (Deputy Director of the Institute of Silicate Chemistry and Technology) and Professor Tsien Cho-Po (Institute of Botany). After attending the Annual General Meeting of the Academy in April they visited scientific institutions in Queensland, New South Wales, Victoria and South Australia. Professor Yen Tung-Sheng is shown above during a visit to the Chemical Research Laboratories, presenting a silk Chinese scroll to the Chairman of the Laboratories, Dr. A. L. G. Rees, while Mr. I. E. Newnham, Chief of the Division of Mineral Chemistry, looks on.

CSIRO Ball

The Melbourne Divisions and Sections of CSIRO will be holding their annual ball this year on Thursday, 5th August, at the Royale Ballroom. Tickets are available at 70/- a double from the ticket secretary, Miss Anne Goss, Records Section, Head Office.

Big Swim

Western Australian fishermen this year discovered two salmon which were tagged off the north-west coast of Tasmania in October, 1962, by the Division of Fisheries and Oceanography.

The movement of salmon from South Australian waters to the Western Australian fishery is well established and a salmon tagged off Lakes Entrance, Victoria, has been caught in South Australia; however, this is the first occasion of fish tagged in Tasmania being discovered in the west.

It is thought that the two tagged salmon went over from South Australia this season with the recruits which leave South Australia each year and reach Western Australia in the latter half of the fishing season.

Anti-Climax

Ring the Division of Forest Products at lunchtime reports E. W. Tipping of the Melbourne Herald, and a girl with a very attractive voice comes on. One of those "interesting" sultry voices.

"This is the CSIRO Division of Forest Products", she says ever so softly. "We are now closed for lunch and would invite you to call us again after 2 o'clock".

You have a thought to ask the girl with the sex appeal in her voice what she's doing for lunch, but then comes the anti-climax—as she adds, "This is a recording!"

Pasta Is Faster

Spaghetti is being used by United States engineers to fabricate an insulator in the head of an electric welding torch used to weld steel tools for parts of the Saturn booster.

Researchers were looking for an insulator which could withstand very high temperatures and serve as a shield against the splatter of molten metal.

In addition, the insulator had to have holes to accommodate a flow of gas, but forming the small holes was a problem.

Researchers now use tiny dry sticks of spaghetti inserted in holes in a plaster mould.

Ceramic material is poured in the mould and baked.

During this process, the spaghetti goes up in smoke, leaving nothing but the holes exactly where they should be and exactly the right size.

In comparison with other methods, pasta is faster.

Research Fellowship

The Federal German Government is offering a Ludwig Leichhardt Research Fellowship for post graduate research by an Australian, preferably in the natural sciences, in West Germany or West Berlin during 1965/66.

Further information may be obtained from the Embassy of the Federal Republic of Germany, Canberra. Applications close at the end of this month.

Draughts Champion

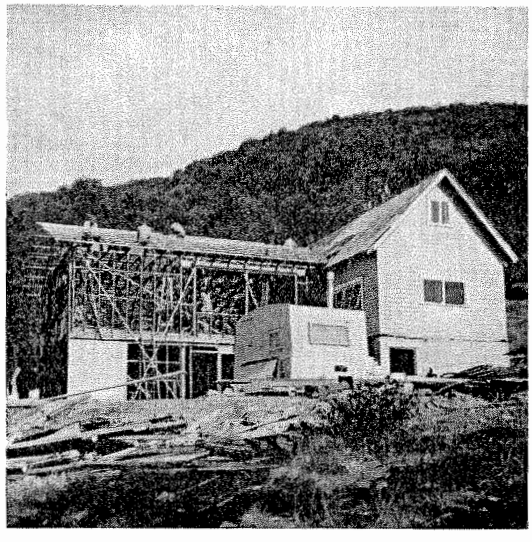
Mr. W. McLaughlin of the Division of Textile Physics fought off a strong field of contestants last April to come second in the Bi-Annual Championship of the Melbourne Draughts Club.

Ski Lodge Extends

Enthusiastic members of the CSIR Ski Club have been working hard since last September to extend the lodge at Mount Buller from about ten squares to thirty squares. This will increase the accommodation of the lodge from twenty to twenty-eight.

The work is being supported by a loan from members of the Club. The original lodge was built twenty years ago and was the first one on the mountain. The Club hopes that the extension will have reached the "lock-up" stage before winter sets in.

Below. CSIR Ski Club members at work on the extension to the lodge at Mount Buller.



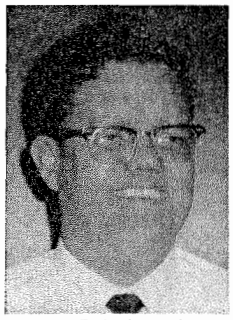
New Appointees

Mr. P. Bleeker has been appointed to the Division of Land Research and Regional Survey as a soil scientist with one of

Mr. P. BLEEKER

the Division's resources survey teams. Mr. Bleeker graduated in geology last year from the University of Utrecht.

Dr. L. E. Donaldson has been appointed to the Division of Animal Physiology where he will study the effect of nutrition on embryonic mortality in cattle. Dr. Donaldson graduated B.V.Sc. from the University of Queensland in 1957, and M.V.Sc. from the same



Dr. L. E. DONALDSON

University in 1962. He obtained his Ph.D. from Cornell University in 1964 and has continued there as a research associate in the Department of Animal Husbandry, where his work has been concerned with corpus luteum function in the cow.

Mr. D. L. Jitts has been appointed to the Division of Plant Industry where he will be in charge of the workshops and associated services of the Division in Canberra. He will also work on the design and development of research equipment and facilities for re-

Mr. D. L. JITTS

search. Mr. Jitts obtained his Diploma of Mechanical Engineering from Sydney Technical College in 1956 and has worked with several engineering and chemical firms.

Miss L. M. Cherry has been appointed to the Division of Entomology where she will study the biochemistry of the cattle tick, particularly in relation to the resistance of cattle to ticks and of ticks to insecticides. Miss Cherry graduated B.Sc. from the University of Queensland in 1942 and M.Sc. from the University of London in 1957. For the last seven years she has been Senior Demonstrator in the Biochemistry Department of the University of Queensland.

Mr. B. R. Hayes has been appointed to the Soil Mechanics Section where he will carry out research on systems for engineering terrain classification and on terrain evaluation for engineering purposes. After obtaining his Diploma of Geology from the Royal Melbourne Institute of Technology in 1962, Mr. Hayes spent a year at the University of Melbourne. Last year he was in charge of a drilling team prospecting for rutile, zircon, ilmenite, monazite, and other heavy minerals on Fraser Island.

Marcia Arnold (left), Anne Bloomfield, Janet Ward, and Denise Boughton, found it warmer in than out at the CSIRO swimming carnival at the Melbourne City Baths last April. Janet was a member of the Forest Products team; her friends were with the Building Research team. Head Office, the Chemical Research Laboratories, and the Divisions of Mechanical Engineering and Protein Chemistry, also entered teams in the carnival which was organized by the Head Office Social Club. After a long battle Forest Products emerged victorious.

Mr. B. J. J. McHugh has been appointed to the Division of Animal Genetics where he will be concerned with the design of experimental programmes, the development of appropriate systems of data recording, and the statistical analysis and interpretation of research results. After graduating B.Sc. (Hons.) from the University of Sydney in 1950, Mr. McHugh spent five years with the Division of Radiophysics where he became involved in programming the CSIRAC computer. From 1955 to 1959 he worked with the New South Wales Forestry Com-

Mr. B. J. J. McHUGH

mission and since then he has been a programmer at the University of New South Wales.

Mr. B. F. Lino has been appointed to the Division of Animal Physiology where he will investigate various aspects

Mr. B. F. LINO

of reproduction in sheep and other animals. Mr. Lino graduated B.Sc. (Wool Technology) from the University of New South Wales last year.

Mr. R. M. Rabbidge has been appointed to the Division of Plant Industry where he will be responsible for physical studies associated with controlled environments and with operational and experimental procedures within CERES. After obtaining his Diploma of Applied Physics from Sydney Technical College in 1958, Mr. Rabbidge spent five years with the Division of Textile Physics working on the physics of wool and on physical and chemical aspects of wool processing. For the last twelve

Mr. R. M. RABBIDGE

months he has been a physicist with the Commonwealth Experimental Building Station at North Ryde.

Miss Janne Robinson has been appointed to the Soil Mechanics Section where she will be in charge of the Section's library. She will also work on the development of a mechanized system of information retrieval. Miss Robinson graduated B.A. from the University of Queensland in 1963 and has been with the Queensland Public Library for the last six years.

Mr. S. L. Sherlock, who graduated B.Sc. from the University of New South Wales last year, has been appointed to the Division of Mathe-

Mr. S. L. SHERLOCK

matical Statistics. He will be stationed at the Division of Food Preservation where he will work on the statistical design and analysis of the Division's experiments.

Courtesy "The New Yorker".

"It seems they were following parallel lines of investigation when they suddenly converged."

Printed by CSIRO, Melbourne

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CORESEARCH

FOR CIRCULATION AMONG MEMBERS OF CSIRO STAFF — NUMBER 76, MELBOURNE, JULY 1965

LEATHER RESEARCH LEADER

Dr. P. Mason has been appointed leader of the newly established Leather Research Section of the Division of Protein Chemistry.

For the last three years Dr. Mason has been working with the Division of Textile Physics where he has been looking at the relations between the chemical structure of wool and its physical properties.

Dr. P. MASON

Dr. Mason graduated B.Sc. from the University of London in 1943.

Before coming to Australia in 1962, he was concerned mainly with research on natural rubber. He obtained his Ph.D. from the University of London in 1959 for his work on the visco-elasticity of strained rubber.

Several members of the staff of the Leather Research Section have now been appointed and fundamental research is already in progress on the structure and properties of hides and skins in relation to processing and end use.

The Leather Industry Research Association (LIRA) which was formed late last year to promote scientific research related to leather manufacture is providing £22,000 a year to support the Section's programme.

The Commonwealth Government is providing a similar amount.

The leather industry is an important one. There are some one hundred tanneries in Australia with an annual production worth about £22 million.

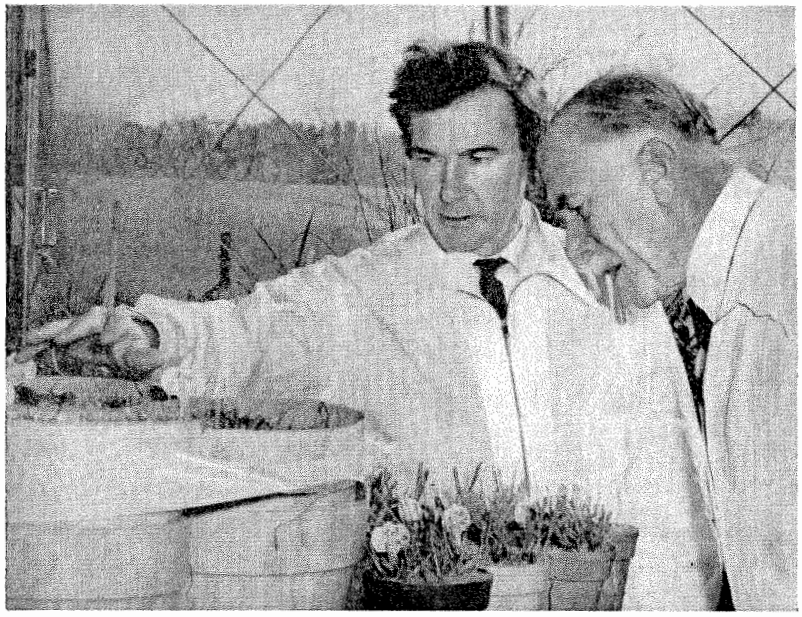
Moreover, Australia produces 38 million sheepskins and 8 million other skins, mostly from cattle, and these are processed into leather both locally and overseas.

At present leather faces a severe threat from plastics. Research into ways of improving its properties is therefore essential if it is to hold its own in the market and compete successfully with rival materials.

Honour

Mr. A. J. Vasey, Executive Secretary of the Commonwealth Scientific Committee, was awarded an M.B.E. recently in the Queen's Birthday Honours List for services to Australian agriculture.

Mr. Vasey, who was formerly Technical Secretary of the Division of Animal Health and Secretary of the Animal Production Committee, was seconded to his present post in 1963.



Administrator Sees Canberra Divisions

Last month His Excellency Colonel Sir Henry Abel Smith, Administrator of the Commonwealth, paid a number of visits to CSIRO laboratories and field stations in Canberra.

On Wednesday, June 2nd, His Excellency was taken on a tour of the phytotron. He showed considerable interest in the wide range of plants being tested there, particularly those from more tropical climates.

He then inspected the microbiology, genetics and biochemistry laboratories of the Division of Plant Industry where he saw something of the Division's work on root nodule bacteria in legumes, the breeding and selection of pasture plants for the Australian environment, and the search for new and better chemicals to control fungal diseases in plants.

His visit concluded with an inspection of the South-Eastern Regional Laboratory of the Division of Soils.

The following Wednesday, His Excellency visited the Division of Land Research and Regional Survey, the Division of Entomology, and the Computing Research Section.

At Land Research he discussed the Division's land survey work in the brigalow country of Queensland with members of the survey team.

He also discussed the growth of fodder crops for northern Australia and saw some of the plant physiological investigations being carried out on bulrush millet.

At the Division of Entomology, His Excellency was shown a film of the Division's activities.

He also saw some of the research being conducted on termites and on control of pests in stored grain.

This was followed by an inspection of the Computer Research Section where he was shown how the computer aided CSIRO research.

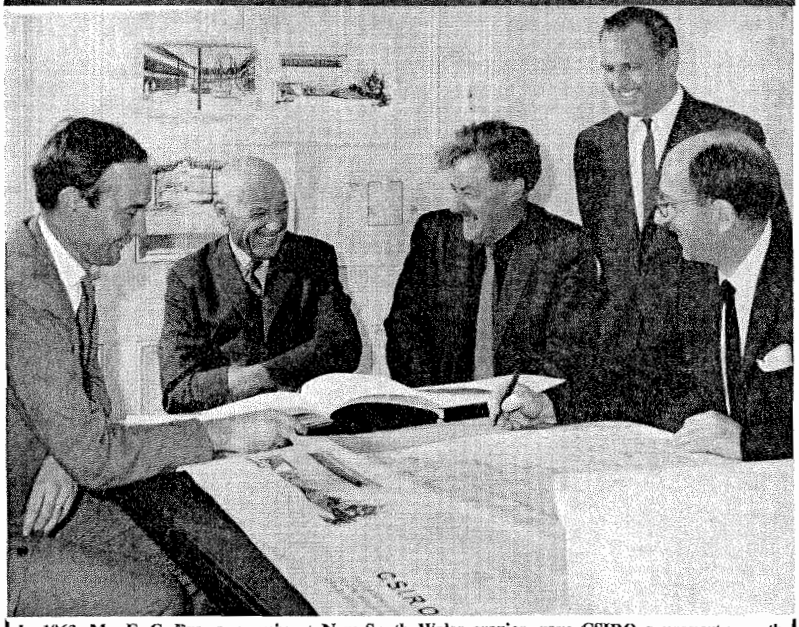
On Friday, June 11th, His Excellency visited the Division of Plant Industry's field station "Ginninderra", and then the Division of Wildlife Research.

As an amateur bird watcher, he was particularly interested in the Division's collection of wild ducks and geese.

Later in the morning he was joined by Lady Abel Smith, and their Excellencies were entertained to a barbecue in the Division's grounds at "Gungahlin".

Our picture above shows His Excellency Colonel Sir Henry Abel Smith inspecting the phytotron at Canberra with Dr. L. T. Evans of the Division of Plant Industry.

CONTRACT LET FOR PYE LABORATORY



In 1963, Mr. F. C. Pye, a prominent New South Wales grazier, gave CSIRO a property worth £250,000. The property was sold and the Executive decided to spend half the proceeds on a new laboratory in Canberra for the agricultural physics group and some of the ecologists of the Division of Plant Industry. Last month the principal tender of £119,328 was let to the building firm of George Wimpey and Co. Ltd. Our picture, taken at the signing of the contract, shows from left, Mr. K. F. C. Woolley of Ancher, Mortlock, Murray and Woolley, architects for the building, Mr. F. C. Pye, Dr. J. R. Philip, who will be leader of the group working in the laboratory, Mr. G. B. Gresford, and (standing) a representative of George Wimpey and Co. The laboratory, which will be known as the "F. C. Pye Field Environment Laboratory", will have three storeys and will be located on the Division of Plant Industry's main Black Mountain site. It will contain a soils and porous medium laboratory, a plant laboratory, a light and heat laboratory, a gas exchange laboratory, a micrometeorological laboratory, a wind tunnel and a hydraulics laboratory.

DELAY ON LOANS REDUCED

Following the recent appeals in Coresearch for investment in the CSIRO Co-operative Credit Society, more than £50,000 has been invested in the last two months, bringing the total investment to date to £350,000.

As a result of this, the waiting time for large loans has been considerably reduced. Smaller loans of up to £300 for personal or urgent medical expenses are still being dealt with with very little delay.

Up to £2,000 repayable over ten years can be borrowed from the Society; however, adequate security is required.

This can take the form of a lien on superannuation, or, in some cases, second mortgages on property, assigned life assurance policies, or a combination of these.

A gilt-edged security investment of 6 per cent. a year is offered to investors in the Society for periods of twelve months or longer.

Money may be deposited with the Society for shorter terms but in these cases the interest rate is 4 per cent.

All CSIRO staff may borrow from the Society, but they must first become members of the Society by purchasing five £1 shares. These shares are redeemable when a member resigns from the Society.

S(COR)

Formulas For Science

Scientific and technological research was probably the most important single factor in economic growth, the Deputy Leader of the Opposition, Mr. E. G. Whitlam, told the Annual General Meeting of the N.S.W. Branch of the CSIRO Officers' Association in Sydney on 31st May.

Its importance had been insufficiently recognized in the past, he said. There was no strategy for science in Australia.

The most recent estimate of Australian expenditure on research in 1962-63 was £54m. or 0.7 per cent. of our Gross National Product. This compared with 3 per cent. in the United States and 2.7 per cent. in Britain.

Mr. Whitlam went on to say that Australia needed administrative machinery so that it could:

- Plan on continuing basis for the development of civil science and technology,
- Determine the overall sum to be spent in each year and the priorities for development,
- Allocate this money to government instrumentalities, universities and research foundations,
- Ensure that the results of scientific and technological research were promptly applied in a manner that would provide maximum benefit to the nation,
- Participate to the fullest possible extent in the international aspects of science,
- Involve scientists and technologists in the operation of this machinery and in the process of arriving at decisions.

The representatives of science and engineering, of industry, labour and consumers needed to be integrated much more closely into the machinery of governments, so that their professional expertise was immediately available for decision making.

Mr. Whitlam then raised a number of questions.

What was the best way, he asked, in which the development of science and technology in Australia could receive the attention it deserved at the political level?

How must the machinery of government be reviewed to inject a much wider range of professional and expert advice at the policy level?

How could scientists and technologists be involved most effectively in the formulation of policy for the development of science and technology?

What was the most effective way of organizing scientific and technological research and development financed by the government.

What were the areas in which Australian research activity was inadequate, particularly in the field of industrial research?

How could the "development gap" be closed so that results of research were applied?

Mr. Whitlam went on to discuss the implementation of scientific policy.

He said that civil science and technology differed in certain important respects from military science and technology. The two fields should be treated separately for policy information, funding and administration.

Mr. E. G. WHITLAM

Among military scientists secrecy and conformity were essential; among civil scientists exchange of information was desirable and ideological loyalty was irrelevant.

The history of the debate over security in CSIRO in the late 1940's showed how easily scientists and a scientific organization could lose morale when civil and military science became enmeshed.

Mr. Whitlam considered that responsibility for scientific and technological research should not be widely dispersed at the present stage of development in the federal sphere.

Australia faced severe and increasing competition from overseas in both primary and secondary industry. This competition would be felt both in the export markets and on the home market.

Australia had a weak research base in terms of the number of scientists employed and the total sum spent per annum by both government and private industry on basic and applied research.

Because of the certainty of competition and the sparsity of our research, our needs could not be left entirely or even largely to be determined by a multitude of organizations and departments whose primary interest lay elsewhere.

There should therefore, he said, be one Minister responsible for a large part of policy on scientific and technological research.

The Minister should be of senior Cabinet rank. He should be involved in the process of policy formulation but not be a dictator of policy.

Mr. Whitlam said that the formulation of policies for science and technology could best be undertaken by a group of scientists and technologists who had considerable skill and experience and a broad view of national needs.

This group or council could consist of senior research scientists in government instrumentalities such as CSIRO and also research scientists from universities and research institutes.

It would meet with the Minister and assist him in the formulation of policy.

This council would need to be serviced by a secretariat which should be staffed by people similar to those in the administrative division of CSIRO.

The secretariat could also keep track of the development of Australian science and technology.

There was no doubt, he said, that special administrative arrangements and organizational structures were necessary if maximum value was to be obtained for money spent on scientific and technological research.

It was essential that the independence of organizations such as CSIRO should be maintained and strengthened. In particular, it was not appropriate for any part of CSIRO's activities to be reviewed by the Public Service Board, since the criteria used by the Board were alien to those essential for the effective carrying out of scientific research.

Impetus for advancement in research came from below, from the laboratory workbench, and necessitated a very different organizational structure from that conventional throughout the public service.

Australia had great need for a foundation that would grant funds for research to individual scientists and technologists and teams of scientists and technologists in universities, research institutes and industry.

This should be additional to funds made available to government instrumentalities, public corporations, such as CSIRO and to the universities.

Mr. Whitlam said that if the results of research were to be applied promptly, there would have to be some organization able to undertake development to the stage where commercial application became feasible.

Furthermore, extension services were necessary if potential users were to be acquainted with new developments.

He considered that the "development gap" could be closed by:

- Creating a development division within CSIRO consisting of applied scientists and technologists which could provide development teams for the purpose of bringing research discoveries up to something like the pilot plant stage. Research scientists could be seconded to this division for periods necessary to carry out such experimental projects.
- Providing tax incentives to industries willing to undertake their own research. Such a scheme had proved very successful in Canada, particularly in encouraging subsidiaries of U.S. companies to undertake research.
- Expanding government testing laboratory facilities; reduction of customs duties on materials and equipment used in industrial research.

Mr. Whitlam felt that one way of ensuring adequate discussion during policy formulation was by the establishment of a Parliamentary Standing Committee on Science and Technology.

This would review proposals for development of science and technology and could, by calling witnesses, enable Parliament and the government to benefit from the comments of scientists who would not otherwise be involved in the process of policy formulation.

In considering science and technology it was very easy, he said, to forget the social sciences, yet it was evident that the scientific and technological changes being wrought in our society were producing social changes of considerable magnitude.

It was essential that research in social sciences and economics be strengthened in Australia.

A national Institute for Social and Economic Research modelled on the lines of CSIRO could be set up to undertake this.

Mr. Whitlam then went on to say that, while scientific research required special organization and administrative arrangements, even the most ideally constructed organization could, if it became too large, impede the proper advance of research.

The Minister responsible for CSIRO had already suggested that CSIRO may have reached its maximum size.

It might now be opportune to examine CSIRO to see whether the time had arrived when it could be suitably divided into two separate organizations, both inheritors of the admirable arrangements which had made CSIRO a world renowned scientific organization.

Although there was a great deal more that Australia could do in the field of scientific and technological research, we could not do everything.

It was inevitable that some research workers were going to be disappointed because projects which they felt to be important were not accorded priority.

Two things emerged from this:

Firstly, the best people to decide priorities were clearly research scientists and technologists themselves, with suitable guidance from the government.

Secondly, if there was more than one organization undertaking research which was being financed by the government, the problem of budgeting for the proper functioning of the organizations became relevant.

Was it best to stipulate some overall sum available in a particular year and have the organizations carve it up between them? Or should each organization bargain with the Treasury separately to obtain as much as it could?

Whichever alternative was found to be more satisfactory, it was essential that organizations knew in advance approximately how much they could expect to spend over a given period.

The university had a triennial system, although it had suffered some sudden interruptions in research aspects over the last six months.

CSIRO should also have a triennial budget.

In conclusion, Mr. Whitlam pointed out that one of the essential elements of scientific and technological research which was commonly overlooked was that of technical and administrative assistance.

Scientists and technologists could not work effectively unless they had a high level of competent technical and administrative assistance.

It was essential therefore that technical and administrative personnel should not only have good working conditions and adequate salaries, but also that their morale as individuals and as a group should be high.

SAFETY NOTES

Power Without Glory

If you are a one hundred per cent. law-abiding citizen, the following article will be of little interest to you. It is written for that vast army of "Do-it-yourself" experts. The subject is electrical wiring.

It should be made quite clear at the outset, that repairing or replacing any electrical fitting, apart from light bulbs, is strictly illegal. It must be done by a qualified electrician.

However, let's face the facts. Most of us at one time or another repair a broken power flex, replace a plug, or otherwise interfere with fittings designed to carry a lethal charge.

In Australia, the colour code for flex or other cable is green for earth, red for active and black for neutral.

Looking at a socket or general power outlet, the recommended wiring sequence, going in a clockwise direction, is earth, active, neutral. Looking at a power plug, the order is reversed, that is, in a clockwise direction, it is earth, neutral, active.

This ensures that the active line at the socket continues through the active line at the plug.

This is most important if the appliance being plugged into the socket has its own inbuilt switch, for if the polarity of the wiring is reversed at the plug-socket connection, the appliance switch will probably operate on the neutral line.

It is in your best interest, therefore, to check the following points:

- Have an electrician check that all power points are, in fact, earthed.
- Make sure that the outlet switch operates on the active line, and that the outlet wiring is as described above.
- Make sure all appliances are connected to the earth wire.
- Check imported equipment, particularly continental appliances (e.g., photographic projectors), to make sure that the wiring is correct. A different colour code applies in some countries, one of which uses red for earth. If this is connected to the active line at the plug, the results could be disastrous.

Remember, only a qualified electrician is permitted to legally interfere with or install electrical wiring, but the advice given to "Little Angeline" is also applicable here, "Be good, but if you can't be good, be careful".

J. W. Hallam, Safety Officer.

POSITIONS VACANT

The following vacancies for professional appointments are current:—

EXPERIMENTAL OFFICER (EO1/2) — MICROBIOLOGIST — Division of Food Preservation: 300/412 (9th July).
EXPERIMENTAL OFFICER (EO2/3) — Upper Atmosphere Section: 544/22 (9th July).
RESEARCH SCIENTIST (RS) — Division of Mechanical Engineering: 430/224 (16th July).
RESEARCH SCIENTIST (RS/SRS) — INSECT PHYSIOLOGIST — Division of Entomology: 180/316 (16th July).
RESEARCH SCIENTIST (RS) — SOIL ZOOLOGIST — Division of Soils: 270/305 (16th July).
RESEARCH SCIENTIST (RS) — PEDOLOGIST — Division of Soils: 270/304 (16th July).
SCIENTIFIC SERVICES OFFICER (SSO1/2/3) — Computing Research Section: 900/28 (22nd July).
EXPERIMENTAL OFFICER (EO1/2/3) — Computing Research Section: 900/27 (22nd July).
RESEARCH SCIENTIST (RS/SRS/PRS) — Computing Research Section: 900/26 (22nd July).
RESEARCH SCIENTIST (RS) — POST-DOCTORAL FELLOWSHIPS — Division of Protein Chemistry: 462/227 (23rd July).
EXPERIMENTAL OFFICER (EO1/2) — OPERATIONAL RESEARCH — Division of Building Research: 390/331 (30th July).
RESEARCH SCIENTIST (RS/SRS) — ECOLOGIST — Division of Entomology: 180/317 (30th July).
RESEARCH SCIENTIST (RS/SRS) — PHYSICAL CHEMIST — Division of Mineral Chemistry: 610/35 (16th August).

News In Brief

Gilruth Prize

Mr. H. McL. Gordon has been awarded the Australian Veterinary Association's highest honour, the Gilruth Prize. The prize, which is awarded every year for meritorious service to veterinary science in Australia, commemorates the name of Dr. J. A. Gilruth, the first Chief of the Division of Animal Health and Production.

Doctorate

Dr. E. G. Hallsworth, Chief of the Division of Soils, has been awarded the degree of Doctor of Science by the University of Leeds.

Honorary Member

Dr. R. C. Gifkins of the Physical Metallurgy Section has been made an honorary member of the Iron and Steel Institute of Japan in recognition of his contribution to world metallurgical research. Dr. Gifkins is Federal President of the Australian Institute of Metals.

Chairman

Mr. F. G. Hogg of the Division of Mechanical Engineering has been appointed Chairman for 1965 of the Victorian and Tasmanian Committee of the Institution of Electrical Engineers, London.

Director

Dr. D. B. Parbery has resigned from the Division of Land Research and Regional Survey to take up an appointment as Director of the newly formed Australian Potash Research Institute. The Institute is sponsored by the Foundation for International Potash Research of the United States. Its head office will be in Canberra.

Bridge Champions

A CSIRO Bridge Team recently won the "A" Grade Championship in the 1965 Melbourne Bridge League. The team was captained by Dr. H. Scott of the Division of Tribophysics and included Mr. M. H. Loretto, Mr. A. V. Davis, and Mr. W. A. Daunt of Tribophysics, and Mr. R. A. Buchanan and Dr. E. H. Ramshaw of the Division of Dairy Research.

Visitors

Dr. Ljiljan Tosic of the Tobacco Research Institute, Belgrade, Yugoslavia, is spending nine months with the Microbiology Section of the Division of Plant Industry on an F.A.O. Fellowship. Dr. Tosic will study the biology, ecology, and control of the fungus responsible for blue mould disease of tobacco. The disease, which was first detected in Europe seven years ago, destroyed half the entire Yugoslav tobacco crop in 1961.

Two Portuguese agricultural scientists, Mr. David Crespo of the Department of Forage Crops, Elvas, and Mr. M. Barreira Da Ponte of Fundo Fomento Florestal e Agricola, Lisboa, visited the Division of Plant Industry recently to see something of the Division's work on improved pastures. Their visit follows that of Mr. Hely of the Division, who spent several weeks in Portugal recently advising on the revegetation of water catchment areas.

The Organizing Committee for the 1965 Melbourne Ball hope to make this year's event the biggest and brightest yet. Busy discussing the arrangements are, from left to right, Miss Helen Webster (Protein Chemistry), Mr. J. Dunne (Head Office), Miss Jan Gardner (Chemical Research Laboratories), Mr. K. Fenton (C.R.L.), Miss Jan Mead (C.R.L.), Miss Katherine Brennan (H.O.) and Mr. Michael Beech (H.O.). Seated with his back to the camera is Mr. D. Constable (C.R.L.). The ball will be held at the Royale Ballroom on Thursday, 5th August. Tickets are available at 70/- a double from the ticket secretary, Miss Anne Goss, Records Section, Head Office.

LETTER TO THE EDITOR

Sir,—It must be very difficult to report a three-hour discussion (Advisory Council, May 18) in a couple of columns and retain every shade of meaning expressed by the various speakers.

In summarising my own contribution to the discussion, however, the report in Co-research attributes to me views which are completely at variance with those I tried to put forward.

In this discussion I said that a case can be made for allowing Ph.D. students to carry out their work in CSIRO laboratories.

Certain Divisions could offer facilities which are not available in universities; many CSIRO scientists are distinguished in fields not represented in universities, and it can be held that students should be allowed to work with such people.

Moreover, as many CSIRO Divisions are "ageing" a few Ph.D. students would be stimulating.

On the other hand, any suggestion that CSIRO should supervise Ph.D. students would be bound to meet opposition from the universities.

The universities have been striving to build up their research schools (with considerable success) and would be reluctant to see Ph.D. students go to other laboratories.

Moreover, the Ph.D. student in a university gains experience quite apart from his formal research training.

He learns from other students in his own department and in other departments, he attends seminars and lectures on many topics, he works long hours, and he can take part in general university functions.

His years at university are formative in many ways which he would miss outside the campus.

These latter considerations seem to me to be very important.

I conclude that CSIRO should not try to train Ph.D. students, except in a few special circumstances and when the CSIRO laboratory is adjacent to and works in close harmony with a university department.

On the other hand, the number of Ph.D. students in universities has been increasing so rapidly in recent years that many university Departments will soon have as many as they can handle.

Under these circumstances CSIRO could be invited to participate to a greater extent than at present.

G. M. Badger

The two scientists are particularly interested in Australian pastoral research since much of Portugal is similar in climate and soils to parts of Australia and several of our important pasture plants appear to have originated there. They said that some thousands of acres in Southern Portugal would be sown to permanent pastures this year using pasture plants and techniques developed in Australia.

Open Days

The National Standards Laboratory, which consists of the Divisions of Physics and Applied Physics, will be open to visitors in the afternoon and evenings of August 10th and 11th. The Laboratory is responsible for the legal standards of measurement in Australia.

Visitors will be able to see something of the Laboratory's facilities for the precise measurement of a wide range of physical quantities and for research into the development of more accurate standards of measurement.

This research is concerned with such things as new length-measuring techniques, photometry, measurement of temperature and electrical quantities, phenomena at very low temperatures, the absolute determination of gravity, and the absorption of energy by dielectrics.

Ughh!

Mr. R. A. Buchanan of the Division of Dairy Research has developed a method of coating cheese with chocolate for sale on the Japanese market.

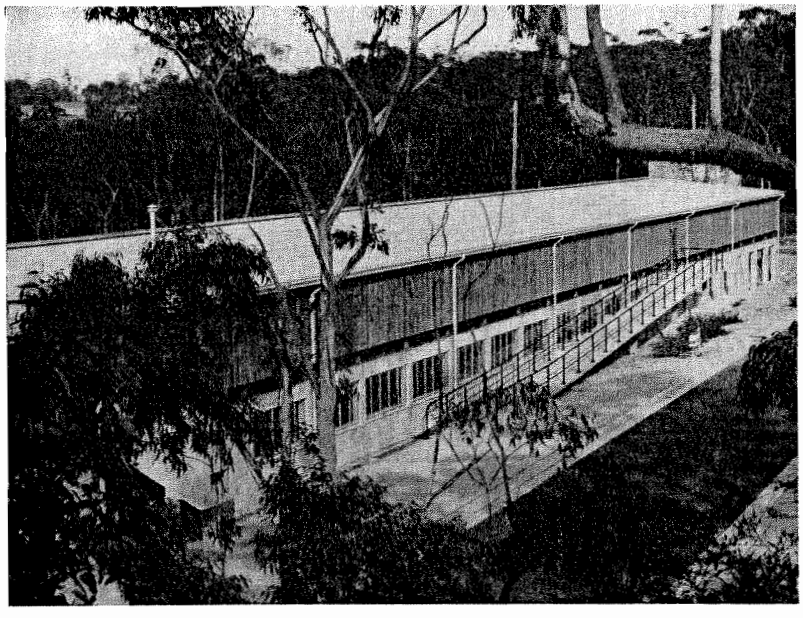
Poultry Centre Shifts

The Poultry Research Centre of the Division of Animal Genetics is currently moving from its present accommodation at Werribee, Victoria, to two newly completed buildings at North Ryde, Sydney.

This transfer involves the sending by air and by rail of 1½ tons of fertile eggs in eighteen shipments. Altogether some 27,000 eggs are involved, each of which must be individually wrapped and packed.

The first of the new generation of birds is due to be hatched in Sydney early this month and for a time there will be a population of young birds in Sydney, and a population of older birds at Werribee. However, the work at Werribee will cease early next year when the older birds are no longer required for research.

Below is one of two Poultry Research Units built recently for the Division of Animal Genetics at North Ryde.



Thought For The Month

"An academic career puts a young man into a kind of embarrassing position by requiring him to produce scientific publications in impressive quantity—a seduction into superficiality which only strong characters are able to withstand."

Albert Einstein

Overseas Visits

Dr. A. J. Dyer of the Division of Meteorological Physics will leave later this month to attend a UNESCO Symposium on Ecosystems in Denmark and a CACR Symposium on Atmospheric Chemistry, Circulation, and Aerosols in Sweden. Dr. Dyer will also visit meteorological research centres in Britain and North America before returning to Australia in September.

Mr. R. Beeby of the Division of Dairy Research left recently on a four months visit to France, Britain, Holland, Switzerland and the United States where he will visit laboratories engaged in research on milk proteins. Mr. Beeby will attend a Specialist Meeting on Milk Caseins in France next October.

Mr. W. Ives, Associate Member of the Executive, leaves shortly for Britain where he will head the Australian delegation attending the Review Conference of the Commonwealth Agricultural Bureaux. Mr. Ives will also visit Europe, Canada, Trinidad and Mexico and will be away for about six weeks.

Dr. F. K. McTaggart of the Division of Mineral Chemistry will leave at the end of this month for Russia, France, Yugoslavia, Sweden, Holland, Britain, North America, and Japan, where he will visit research laboratories concerned with microwave chemistry. He will also present a paper at the IUPAC Conference in Moscow and will attend the 7th International Conference on Phenomena in Ionised Gases at Belgrade.

New Appointees

Dr. J. L. Huppatz has been appointed to the Division of Plant Industry where he will work on the isolation of natural products and on the design and synthesis of potential biologically active substances. Dr. Huppatz graduated B.Sc. (Hons.) from the University of Adelaide in 1960. He obtained his Ph.D. from the same university in 1963 for his work on the Pschoor reaction as a route to phenanthridine derivatives. For the last two years he has been working at the University of Nottingham on the synthesis and properties of new macrocyclic systems relating to Vitamin B_{12}.

Dr. R. V. Holland has been appointed to the Division of Food Preservation where he will study the chemical properties and structure of tinplate, the interactions between food and tinplate, and specific problems of corrosion. Dr. Holland

Dr. R. V. HOLLAND

graduated B.Sc. from the University of Auckland in 1958 and M.Sc. from the same university in 1959. He obtained his Ph.D. from the University of Auckland last year for work on the crystal structure of some heavy metal complexes. For the last three years he has been carrying out research on X-ray crystallography at the Chemical Department of the University of Sydney.

Dr. K. E. Lee has been appointed to the Division of Soils where he will lead a research team in a study of the influence of soil fauna on the development of soil structure and on the turnover and distribution of organic matter in Australian soils. Dr. Lee graduated B.Sc. from the University of New Zealand in 1947 and M.Sc. from the same university in 1948. Since 1949 he has been working as a soil biologist with the Soil Bureau of the New Zealand Department of Scientific and Industrial Research. In 1960 he became Officer-in-Charge of the Bureau's Soil Biology Section and of its Experimental Station at Lower Hutt. Dr. Lee was

Dr. K. E. LEE

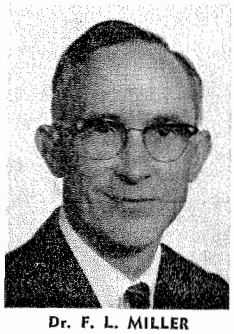
awarded the research medal of the New Zealand Association of Scientists in 1951. He obtained his D.Sc. from the University of New Zealand in 1954.

Dr. R. H. Laby has been appointed to the Division of Animal Physiology where he will undertake research on the properties of foams, particularly the foam responsible for bloat in cattle. Dr. Laby graduated B.Sc. from the University of Melbourne in 1957 and M.Sc. from the same university in 1959. He obtained his Ph.D. from the University of

Dr. R. H. LABY

Adelaide in 1962 for work on the adsorption of amino acids and simple peptides by montmorillonite and illite. For the last three years he has been working on aspects of soil fertility with the Victorian Department of Agriculture.

Dr. F. L. Miller has been appointed to the Agricultural Liaison Unit at Head Office and will act as Deputy to the Assistant Secretary (Agricultural Liaison). After a period of war service in the army from 1939 to 1946, Dr. Miller graduated B.Sc. from the University College of North Wales in 1948. From 1948 to 1951 he was a forest soils officer with the Forest Research Institute in



Dr. F. L. MILLER

New Zealand and from 1951 to 1958 he was Chief Conservator of Soils with the Otago Catchment Board in New Zealand. Dr. Miller spent the next four years as a research instructor in the Department of Agronomy at Kansas State University where he obtained his Ph.D. in 1962. Since then he has been a senior lecturer in the Botany Department of the University of Melbourne.

A small "house-warming" party was arranged last month when all sections of the Division of Plant Industry's workshop moved into new accommodation. The sections, which were previously located in a group of separate sheds, are now housed together in the one building (see Coresearch 73, April 1965). Among those celebrating were, from left to right: Dr. J. E. Falk (Chief of the Division), Mr. W. Riley (Paint Shop), Mr. G. Lemon (Machine Shop), Mr. A. Lambert (Carpenters' Shop), Mr. A. Dale (Electrical Shop), Mr. D. Jitts (Divisional Engineer), Mr. E. Sabbagh (Draftsman), and Dr. O. H. Frankel (Member of the Executive).

Mr. P. S. Mulhall has been appointed to the Division of Radiophysics where he will prepare computer programmes for processing data obtained in the course of the Division's research on radio astronomy and rain and cloud physics. He will also work on the design of scientific projects to ensure

Mr. P. S. MULHALL

their suitability for subsequent machine data processing and on the development of methods for data storage and retrieval. Since graduating B.Sc. (Hons.) from the University of Sydney in 1964, Mr. Mulhall has been working with the New South Wales Department of Agriculture as a biometrician.

Dr. J. G. Scroggie has been appointed to the Division of Protein Chemistry where he will study the structure and properties of hides and skins and of the leather obtained

Dr. J. G. SCROGGIE

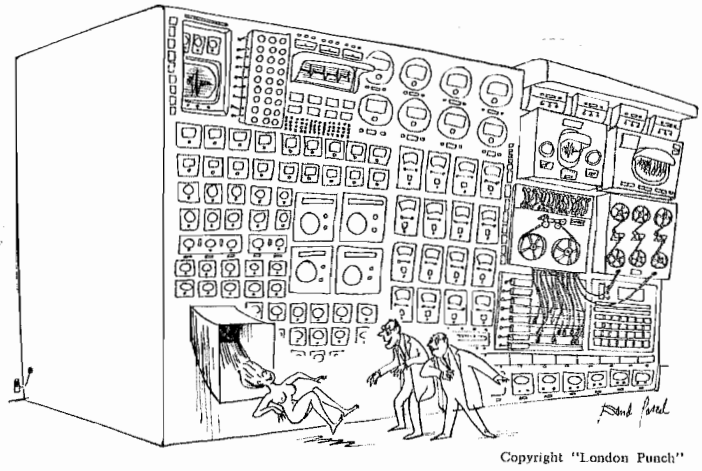
from them. Dr. Scroggie graduated B.Sc. from the University of Melbourne in 1962 and M.Sc. from the same university in 1944. He obtained his Ph.D. from the University of Melbourne in 1958 for his work on the reactions of nitroarylamines. Since 1956 he has been lecturer in chemical pathology and Deputy Director of the Forensic Science Laboratory in the Pathology Department of the University of Melbourne. His research has been concerned with the determination of alcohol in body fluids and the investigation of the application of modern analytical techniques to the solution of forensic problems.

Mr. H. R. Webb has been appointed to the Agricultural Liaison Unit at Head Office where he will be concerned with the organization and management of technical conferences and congresses. Mr. Webb graduated B.Agr.Sc. from the University of Melbourne in 1942, and B.Com. from the same university in 1954. Between 1942 and 1945

Mr. H. R. WEBB

he was associated with the War Agricultural Committees and from 1945 until 1952 he undertook developmental work with the Victorian State Electricity Commission on the use of electricity in agriculture. Since then he has held a number of senior positions with commercial organizations.

Miss P. M. Thorne has been appointed to the Division of Plant Industry and will work at the Tobacco Research Institute, Mareeba, on changes in enzymatic activity of the tobacco leaf with particular reference to pigment changes during development, maturity, and senescence. After graduating B.Sc. from the University of Queensland in 1952, Miss Thorne spent eight years with the Division of Tropical Pastures working on the chemical analysis of plants. For the last five years she has been a chemist with the Department of Agriculture, Stock and Fisheries, in the Territory of Papua New Guinea.



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"All I did was to feed in a chit marked 65% oxygen, 18% carbon, 10% hydrogen, 3% nitrogen, 1.5% calcium, 1.0% phosphorus, 0.35% potassium, 0.25% sulphur, 0.15% sodium, 0.15% chlorine, and 0.6% trace elements."

Printed by CSIRO, Melbourne

CORESEARCH

FOR CIRCULATION AMONG MEMBERS OF CSIRO STAFF — NUMBER 77, MELBOURNE, AUGUST 1965

NEW CHIEF FOR BIOCHEMISTRY

Dr. A. T. Dick of the Division of Animal Health has been chosen to succeed Dr. H. R. Marston as Chief of the Division of Biochemistry and General Nutrition. Dr. Dick will take up his new appointment when Dr. Marston retires this month.

It was announced in the May issue of Coresearch that Dr. C. H. Gallagher of the Division of Animal Health had been appointed to this position; however, Dr. Gallagher has now withdrawn in order to accept the Hughes Professorship of Veterinary Pathology and Bacteriology at Sydney University.

After leaving school, Dr. Dick worked first with the Mt. Lyell Chemical Works and then with White Crow Ltd.

At the same time he undertook the evening diploma course in applied chemistry at Melbourne Technical College and qualified as a Public Analyst.

Dr. Dick then proceeded to the University of Melbourne where he graduated B.Sc. with honours in 1932 and M.Sc. in 1938.

He joined the CSIR Division of Animal Health and Production in 1933 as a bacteriologist and worked with Dr. A. W. Turner at Townsville on contagious bovine pleuropneumonia.

The practical outcome of this work was the "V5" vaccine which has materially assisted in the virtual eradication of the disease from Australia.

While in Queensland, Dr. Dick also carried out research on "pegleg", a disease of cattle associated with phosphorus deficiency.

In 1936 he transferred to Melbourne where he became leader of the Division's chemical pathology group.

Dr. Dick's major contribution has arisen from the work he has carried out over the last twenty-five years on the copper metabolism of sheep.

He was the first to demonstrate interactions between trace elements in animal nutrition.

With Dr. L. B. Bull, he led a joint investigation which elucidated the complex problem of toxaemic jaundice in sheep.

This disease has caused heavy losses from chronic copper poisoning and from liver damage by toxic alkaloids which occur in many species of plants widely distributed in Australia.

Dr. A. T. DICK

In recent years he has devoted himself largely to the investigation of the wide range of biological activities of these liver-damaging pyrrolizidine alkaloids.

Dr. Dick was awarded the degree of Doctor of Science from the University of Melbourne in 1954 for his studies on toxaemic jaundice of sheep.

The same year he shared the David Syme Research Prize of the University of Melbourne with Dr. A. McL. Mathieson of the Division of Chemical Physics.

He was elected a Fellow of the Royal Australian Chemical Institute in 1952 and a Fellow of the Australian Academy of Science in 1964, and was appointed an Officer of the Most Excellent Order of the British Empire in the 1965 New Year's Honours List.

Earlier this year he was awarded a Senior Foreign Scientist Fellowship by the National Science Foundation to work at the University of Missouri. He will take up the Fellowship next year.

Dr. Dick has held various offices with the Royal Australian Chemical Institute, the Institute of Medical Laboratory Technology, and the Victorian Society of Pathology and Experimental Medicine.

School For Rainmakers

During the year, the Division of Radiophysics has had several urgent requests from various State authorities for cloud-seeding aircraft to attempt to make rain over regions affected by bushfires and drought.

In response to these requests, the Division has carried out extensive seeding operations in areas of Victoria, New South Wales and Queensland.

Although seeding was followed by good falls of rain in those instances where cloud conditions were right, the absence of controls makes it impossible in operations like this to say whether the rain was due to the seeding.

Nevertheless, in emergencies such as droughts or bushfires, there does appear to be good justification for carrying out cloud-seeding whenever cloud conditions are suitable.

Since the Division of Radiophysics is not equipped and does not have the resources for emergency action of this kind, it has been suggested that the respective State authorities should take over the responsibility within their own States, particularly as they are best able to judge the seriousness of the situation and to assess the priorities of claims from different parts of the State.

The Division has therefore organized a "School for Rainmakers" from August 2nd to 10th, during which selected men from various State government departments in eastern Australia will be given lectures and laboratory demonstrations on cloud-seeding techniques.

They will then be able to take charge of seeding operations in their State if ever a drought or bushfire emergency arises.

The programme at the school will include instruction in basic meterological physics, weather systems and cloud development, cloud physics and rain processes, nucleation, seeding techniques, aircraft problems, applications of cloud seeding to drought and bushfire relief, and general administrative problems.

There will also be flight demonstrations and visits to the Bureau of Meteorology.

Following the school, participants will be given one month's practical experience in the field on one of the Division's cloud-seeding experiments.

Obituary

Dr. K. Sheard, a former officer of the Division of Fisheries and Oceanography, died in Perth on June 15th.

Dr. Sheard came to CSIRO in 1942 from the South Australian Museum where he had established himself as a specialist in several groups of marine crustacea.

After working for three years on zooplankton, he transferred to Perth in 1945 and commenced a study of the Western Australian crayfish.

Dr. Sheard retired in 1961 but continued to publish scientific papers, chiefly on zooplankton. At the time of his death he was engaged in writing up his work on the zooplankton of the eastern and southern Australian continental shelf and slope.

Dr. Sheard was very active in the affairs of the University of Western Australia, being a member of the Standing Committee of Convocation from 1956 to 1961 and of the Senate from 1958 until his death.

He will be long remembered by his many friends.

NEW GUINEA POLITICIANS VISIT WILDLIFE

The Division of Wildlife Research was visited last June by six Members of the Papua-New Guinea House of Assembly. Mr. Eriko Rarupu (left), the Member for Moresby, and Mr. Siwi Kurondo, the Member for Kerowagi, are shown above with one of the Division's white rabbits. The visitors were particularly interested in the Division's work on conservation of animal and bird species.

POSITIONS VACANT

The following vacancies for professional appointments are current:—

EXPERIMENTAL OFFICER (EO 1/2) — Division of Dairy Research — 410/146 (16/8/65).

RESEARCH SCIENTIST (RS/SRS) — Veterinary Immunologist — Division of Animal Health — 202/259 (16/8/65).

RESEARCH SCIENTIST (RS/SRS) — Division of Mineral Chemistry — 601/35 (16/8/65).

RESEARCH SCIENTIST (RS/SRS) — Division of Organic Chemistry — 606/64 (16/8/65).

RESEARCH SCIENTIST (RS) — NATURAL PRODUCTS CHEMIST — Division of Plant Industry — 130/719 (16/8/65).

RESEARCH SCIENTIST (RS/SRS) — Division of Plant Industry — 130/721 (16/8/65).

RESEARCH SCIENTIST (RS) — CARBOHYDRATE CHEMIST — Division of Tropical Pastures — 850/233 (16/8/65).

RESEARCH SCIENTIST (RS/SRS) — MICROBIOLOGIST/BIOCHEMIST — Division of Plant Industry — 130/717 (20/8/65).

RESEARCH SCIENTIST (RS/SRS) — Division of Plant Industry — 130/720 (20/8/65).

RESEARCH SCIENTIST (RS/SRS) — FELLOWSHIP IN ECOLOGY — Division of Plant Industry — 130/722 (20/8/65).

EXPERIMENTAL OFFICER (EO 1/2) — Veterinary Parasitologist — Division of Animal Health — 201/244 (27/8/65).

RESEARCH SCIENTIST (RS/SRS) — PASTURE EVALUATION — Division of Tropical Pastures — 850/232 (27/8/65),

Ozone In The Atmosphere

One of the startling results of early studies of the upper atmosphere was the discovery of a peak in the atmospheric temperature occurring at about 25 miles above the surface of the earth.

This was taken up by Dobson at Oxford round about 1926 and associated with the fact, long known to astronomers, that the atmosphere is opaque to ultra-violet radiation.

Spectroscopic studies then established that this opaqueness to ultra-violet radiation resulted from a diffuse layer of ozone centred about the 25 kilometre level in the atmosphere and that the concentration of ozone molecules amounted to about four millionths of the concentration of all other molecules.

It is fortunate for life on earth that such a layer exists in the upper atmosphere and filters off the ultra-violet light from the sun, which would otherwise be most harmful.

The energy of the solar ultra-violet radiation which is absorbed during the day by the ozone layer is converted into heat and is responsible for the temperature maximum observed in the upper atmosphere.

The greater part of the absorption, and therefore of the heating, takes place in the upper regions of the ozone layer.

The occurrence of ozone in the atmosphere is due to a number of chemical reactions set off by ultra-violet light from the sun.

The radiation is able to break up oxygen molecules into atomic oxygen and some of these atoms combine with ordinary molecular oxygen to yield ozone.

Assuming solar ultra-violet radiation produces the ozone layer, it is to be expected that the maximum ozone content of the whole atmosphere should occur over the equator in mid-summer.

Detailed work in the northern hemisphere soon demonstrated that the real situation was almost exactly the reverse of this.

The ozone maximum occurred in late winter or early spring and in polar rather than equatorial regions.

As a result of measurements carried out at many northern hemisphere stations, a theory to explain this anomalous effect was proposed by Brewer and Dobson in 1946.

It depended on the circulation of stratospheric currents, and ever since the study of the ozone layer has been regarded as a fruitful source of information on this pattern of circulation.

The comparison of northern and southern hemisphere atmospheric phenomena is of particular interest and importance because the southern hemisphere is essentially more symmetrical in the distribution of land masses and this apparently leads to a simpler, more stable and less disturbed pattern of atmospheric circulation and weather.

It is thus easier to understand the normal undisturbed atmosphere by looking at the southern hemisphere, while a comparison with the northern hemisphere should reveal the effects of disturbances.

Unfortunately the network of observation stations in the southern hemisphere is very sparse, largely due to the lack of populated land areas over vast regions of the southern hemisphere.

This makes the existence and increasing number of Australian stations very important to future progress in the study of atmospheric processes and ultimately of the weather all over the world.

A major part in the study of the ozone layer in the southern hemisphere has been undertaken by the Division of Meteorological Physics, at Aspendale, Melbourne.

The Division's ozone programme was initiated in 1954 by Mr. W. C. Swinbank who is a member of the International Ozone Commission — a joint commission of the World Meteorological Organization and the International Association of Meteorology and Atmospheric Physics.

Assisted by the Commonwealth Bureau of Meteorology, the Division operates continuous monitoring ozone stations at Port Moresby, Brisbane, Salisbury, Aspendale and Macquarie Island.

The total ozone content of the upper atmosphere is measured at all these stations using a Dobson spectrophotometer, the Aspendale laboratory acting as a standardisation and calibration centre for all these instruments.

In addition, much detailed information is being obtained at Melbourne on the structure of the ozone layer by weekly ozone-sonde flights. Additional flights are made during the quarterly World Geophysical Intervals.

The ozone-sonde, which is flown on a large weather balloon, consists of a small pump which bubbles air containing the ozone through an electro-chemical cell containing a potassium-iodide solution.

The ozone reacts with the iodide ions allowing an electric current to flow between the electrodes. This current is changed into electrical pulses with a frequency proportional to the ozone concentration, and these pulses are used to modulate a small radio transmitter.

The signals are picked up by a radio receiver at Aspendale and the data converted to give the ozone concentrations at the heights reached by the balloon.

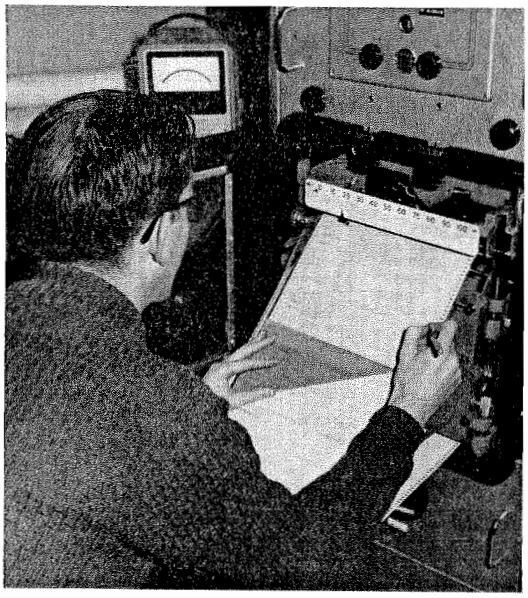
The balloon usually reaches altitudes in excess of 100,000 feet and the pressure and temperature are recorded at the same time.

The ozone-sondes descend to earth by parachute after the balloon bursts, and have a reward notice on them to encourage their return for re-use.

So far about half the ozone-sondes have been returned from various parts of Victoria. This saves a good deal of money, and makes a greater number of observations possible.

Over the past few years some interesting discoveries have been made as a result of these southern hemisphere ozone studies.

Evidence has been obtained of a 26 month periodicity in the total ozone content of the atmosphere.



Above: A good deal of information on ozone concentrations at different altitudes is obtained by weekly balloon flights. Data is transmitted back to Aspendale and recorded graphically on this machine.

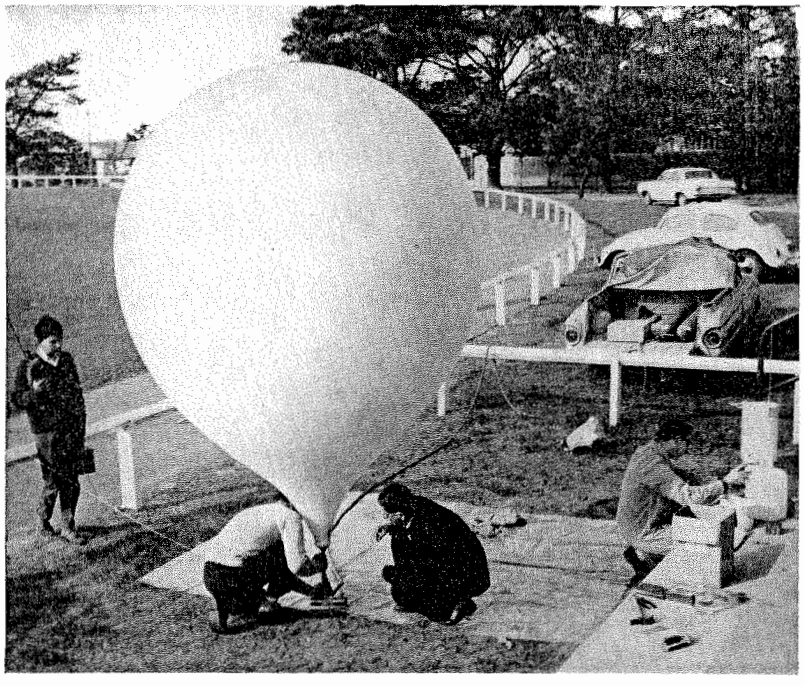
The observation was first made at Aspendale and confirmed a year or so later by the closely knit string of stations in the northern hemisphere.

The origin of this periodicity is obscure, but a 26 month cycle has also been observed in the circulation pattern for stratospheric winds.

In addition to work on transport mechanisms in the stratosphere from ozone observations in the southern hemisphere, evidence based on world-wide data has also been obtained at Aspendale for a correlation between the geomagnetic disturbances associated with anomalous solar activity and the total ozone content of the atmosphere.

Another interesting observation recently made in Colorado was the occurrence of a marked dip in the ozone concentration at an altitude of 20 kilometres. The dip, which persisted for more than a month, was thought to have been caused by destruction of ozone by volcanic dust from the eruption of Mt. Agung, Bali, in March, 1963.

Below. Ozone equipment being prepared at Aspendale for a balloon flight into the upper atmosphere.



SAFETY NOTES

Out Of Step

Fashions change, and whether we like it or not, most of us are slaves of fashion. What well dressed young girl these days does not wear high spiked-heeled shoes with pointed toes?

And what budding Beau Brummel does not regard pointed toes as the most?

If the one ambition of shoe designers was to design the most hazardous type of footwear they could for use on stairways, they would find it hard to improve on today's footwear.

This article is written mainly for the fashion conscious, but many of the more conservative among us will benefit by not being "out of step" on stairs.

The most common causes of falls on stairs are:

Going downstairs: placing the foot too far forward and sliding off the edge of the step; catching a heel on the higher step edge; catching a spike heel in carpeting on the stairs.

Going up stairs: not putting the foot far enough forward on the next step, and sliding back off the edge—particularly with pointed toed shoes; not lifting the foot high enough and tripping over the edge of the higher step.

Going up or down stairs: carrying a load too high to see over, and misjudging the step height or distance; taking two or three at a time; excess speed; rapid cornering.

Remember, take it quietly, place your feet carefully and firmly on each step. Use the balustrade and don't put your hands in your pockets.

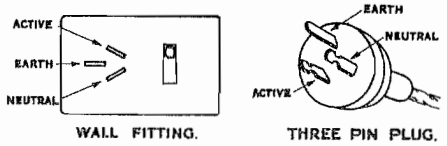
If you fall when going upstairs, you will receive anything from a bad jolting to a broken nose and cut face.

If you fall downstairs, gravity is with you. The only advantage of such a fall is that it makes things easier for the stretcher bearers.

More Power Without Glory

In last month's Safety Notes, I said that looking at a socket or general power outlet, the recommended wiring sequence, going in a clockwise direction, was earth, active, neutral. I also said that looking at a power plug, the order was reversed, so that going in a clockwise direction it was earth, neutral, active.

Unfortunately, I failed to mention how to identify the earth. The illustration below will make this clear.



WALL FITTING. THREE PIN PLUG.

J. W. Hallam, Safety Officer

News In Brief

Chairman Returns

The Chairman, Sir Frederick White, returned last month from overseas where he spent five and a half months visiting scientific research organizations and industrial research centres.

Secretary

Mr. F. G. Hogg of the Division of Mechanical Engineering has been appointed International Secretary of the Solar Energy Society of Australia and New Zealand.

Popular

Mr. I. McLean, an apprentice toolmaker at the Division of Textile Industry, topped the poll recently in the Division's most popular girl contest. Runners-up were Margaret

Mr. I. McLEAN

Hocking and Cheryl Holt. The contest was held to raise funds to sponsor an Indian orphan through the Save the Children Fund.

Votes were a penny each and the competition raised nearly £11. First prize was to have been a mounted photograph of the winner, but in view of the unusual circumstances the Divisional Safety Committee recommended an additional prize of a hairnet.

Visitor

Professor Masao Hasegawa, Chief of the Biological Department of the Tokyo Metropolitan University, is at present spending three months working in the wood and fibre section of the Division of Forest Products. He is collaborating with Mr. W. E. Hillis in biosynthetic studies of stilbene formation and in biochemical studies of sapwood-heartwood formation.

This is Professor Hasegawa's second visit to the Division. In 1961 he spent nine months working with Mr. Hillis on the biosynthesis of wood extractives.

Community Aid Abroad

A Community Aid Abroad group has been established in the Division of Textile Industry at Geelong. The Geelong group, which has over one hundred members, will join with groups at Head Office and the Division of Forest Products to raise £440 for a poultry unit at Madras Christian College Farm. Between them, the three groups have already raised more than £100.

New Home For Wildlife

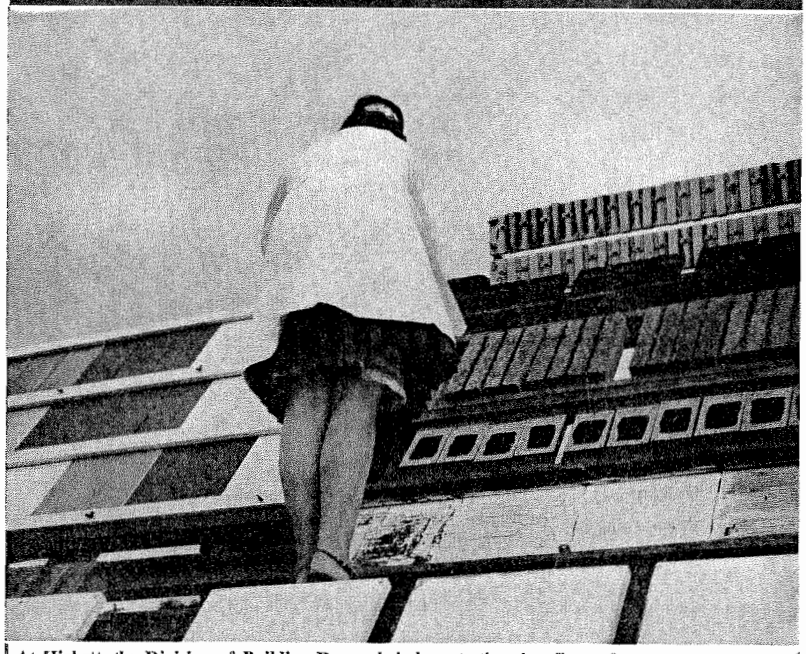
The Division of Wildlife Research has acquired new headquarters for its Western Australian Group at Helena Valley, about fifteen miles from Perth.

The property, which was formerly a Red Poll Stud, will house groups working on mutton birds, emus, black cockatoos, and eagles.

Ersatz

Soviet scientists claim to have produced a synthetic caviar that is indistinguishable from the real thing. According to a Soviet reporter who sampled the caviar, the man-made variety tasted exactly the same as that made by the sturgeon. "Its only shortcoming," he said, "is that you cannot produce fish from it."

BUILDING RESEARCH EXPOSURE SITE



At Highett, the Division of Building Research is busy testing the effects of exposure on all sorts of things. (Photograph by Eric Smith.)

Overseas Visits

Dr. G. D. Aitchison, Officer-in-Charge of the Soil Mechanics' Section, left last month for North America, Britain, Europe and Asia. He will visit a number of research centres and will attend the Conference on Expansive Soils at the University of Texas and the Conference on Soil Mechanics and Foundation Engineering at Montreal. He will return to Australia at the end of October.

Dr. W. W. Forrest of the Division of Biochemistry and General Nutrition left last month for Marseilles where he will spend six months at the Laboratoire de Chemie Bacterienne. Dr. Forrest will also visit India, Israel, Britain, the United States, and New Zealand.

Dr. J. M. Gillespie of the Division of Protein Chemistry leaves shortly for the United States where he will spend a year at the University of Indiana Medical School. He will also visit laboratories in North America, Britain and Europe.

Dr. H. G. Higgins of the Division of Forest Products leaves early this month for Thailand, England and Europe. Dr. Higgins will attend the International Symposium on Macromolecular Chemistry in Prague and the Third Fundamental Research Symposium of the Technical Section of the British Papermakers' Association in Cambridge. He will also visit organizations concerned with wood chemistry, pulp and paper research, and chemical utilization of wood, before returning to Australia at the end of September.

Dr. G. N. Lance, Officer-in-Charge of the Computing Research Section, will leave Canberra on 1st September for a four week visit to South Africa. Dr. Lance has been invited by the South African CSIR to discuss with them Australia's experience in the computing field and its bearing on computer developments pending in South Africa. He will also present a paper to the Second Conference organized by the South African Council for Automation and Computation which is being held in Pretoria from 13th-15th September.

Dr. L. C. Lloyd of the Division of Animal Health left Australia last month for Britain, Turkey, Senegal, Tchad, Nigeria, Sudan, Kenya and South Africa where he will visit veterinary research centres and have discussions on pleuropneumonia. He will be away for about four months.

Mr. P. L. Newland and Dr. C. C. Wood of the Soil Mechanics Section will leave this month to attend the Conference on Expansive Soils at the University of Texas. They will also visit laboratories in the United States, Britain and Europe.

Mr. M. J. Puttock of the Division of Applied Physics leaves this month for a three month visit to Britain, Belgium, North America, Thailand, and Japan where he will visit laboratories concerned with engineering metrology. He will also attend conferences in Belgium and England.

Dr. C. G. Stephens of the Division of Soils will leave shortly on a five month visit to the United States, Nigeria, Rhodesia and South Africa. Dr. Stephens will attend the Inqua Congress at Boulder, Colorado, and will lecture at several United States universities.

Dr. D. J. Swaine of the Division of Coal Research left last month for the United States, Britain, France, and Switzerland, where he will visit laboratories concerned with studying the mechanism of inorganic reactions at high temperatures. He will be away four months.

Mr. E. H. Waters of the Division of Building Research leaves early this month on a three month visit to Israel, Europe, Britain, North America, and New Zealand. Mr. Waters will visit building research centres in connection with his work on problems associated with the movement of water in the fabric of buildings and on the properties of mortar and renderings.

GUIDANCE AIDS FOR THE BLIND

A new ultrasonic torch to aid the blind is at present being tested by Mr. A. G. Driver, Laboratory Secretary of the Division of Physics and Miss E. E. Dickason of the National Standards Laboratory library.

The instrument has been developed in the University of Birmingham and a number of them have been brought to Australia for evaluation and examination with funds provided by the Reserve Bank.

The device produces a 10° ultrasonic beam.

There is continuous transmission of a sawtooth-shaped signal which is swept from 60 kc/s through 30 kc/s with a repetition rate depending on the setting of the range switch; a slow rate of 4-5 sweeps/second for the long range, and a fast rate of 8-10 sweeps for the short range.

Ideally the listener will only hear a signal when there is an object in the beam.

The display is produced by the difference in frequency between emitted and received signal and is therefore in the audible range, except for the flyback period when a filter rejects all frequencies above 3 kc/s.

What one hears is a series of pips (their rate depending on the sweep repetition rate) having a high pitch when the object is far away, and going down in pitch as the object comes closer.

Range is therefore indicated by pitch.

Apart from the fact that the equipment is too bulky, there are still a number of technical problems to be solved before the guide can come into general use.

Below: Mr. A. G. Driver of the Division of Physics demonstrates the new ultrasonic aid for the blind which is undergoing tests at the National Standards Laboratory.

New Appointees

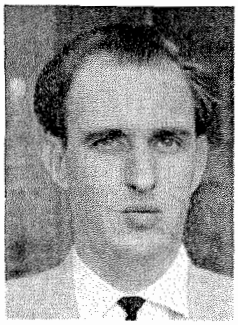
Mr. R. R. Couper has been appointed to the Division of Building Research where he will undertake experimental studies for the design of steam curing chambers. He will also work on the measurement and analysis of deformations in

Mr. R. R. COUPER

buildings. Mr. Couper obtained his Diploma of Engineering from Swinburne Technical College in 1956. Since then he has worked with several engineering and construction companies.

Dr. Marjorie V. Jago has been appointed to a research fellowship with the Division of Animal Health where she will work on the qualitive changes occurring in the synthesis of nuclear and cytoplasmic proteins in the liver cells of animals suffering from chronic pyrrolizidine alkaloid poisoning. After graduating B.Sc. from the University of Sydney in 1944, Dr. Jago taught science in Australia and the United States. She also spent three years with the Department of Agriculture in Fiji. Since 1952 she has undertaken research at the White Memorial Hospital, Los Angeles, the University of Melbourne, and the Ontario Cancer Institute in Canada. She obtained her Ph.D. from the University of Melbourne in 1958 for enzymic studies in relation to tumour development.

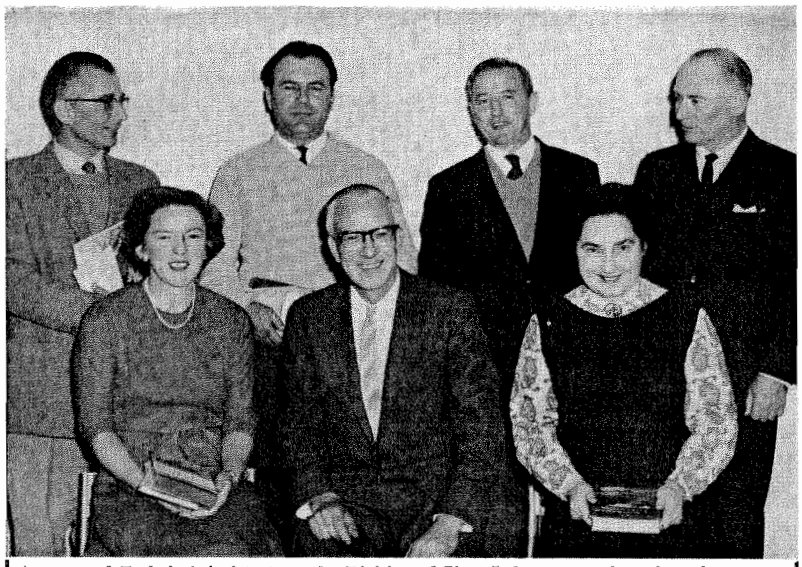
Dr. T. G. Kyle has been appointed to a research fellowship with the Division of Meteorological Physics where he will undertake research in atmospheric radiation. Dr. Kyle graduated B.Sc. from the



Dr. T. G. KYLE

University of Oklahoma in 1960 and M.Sc. from the same university in 1962. For the last three years he has been working on infra-red measurements and military development projects at the University of Denver where he recently obtained his Ph.D. for research on the absorption of solar radiation by carbon dioxide in the atmosphere.

Professor K. McEntee, Professor of Veterinary Pathology at New York State Veterinary College, Cornell University, has been appointed to a research fellowship with the Division of Animal Health where he will work on bovine infertility. After graduating D.V.M. from the New York State Veterinary College in 1944, Professor McEntee worked for a short while as a general practitioner and then accepted a commission in the Army Veterinary Corps. Since 1947, Professor McEntee has been engaged in research at the Department of Pathology and Bacteriology of New York State Veterinary College on reproductive diseases of dairy cattle.



A group of Technical Assistants at the Division of Plant Industry recently undertook a course at Canberra Technical College to learn something of the principles of plant culture, particularly under glasshouse conditions. The course was conducted at the request of the Division and several book prizes were awarded. Mr. Sylvester Knedlhans received the Plant Industry Prize, which was donated by Dr. O. H. Frankel of the Executive, and special prizes were given to Mrs. Ina Medikis and Mr. H. Tantala. The prizes were presented by the Chief of the Division, Dr. J. E. Falk, at an informal ceremony at Black Mountain. Our picture shows, from left to right: Mr. S. Knedlhans, Mrs. A. Jones (private student), Mr. H. Tantala, Dr. J. E. Falk, Mr. G. H. Featherston (course lecturer), Mrs. I. Medikis, and Mr. W. Smith (Principal, Canberra Technical College).

Dr. M. A. Naughton has been appointed to a research fellowship in molecular genetics with the Division of Animal Genetics. Dr. Naughton graduated B.Sc. from the University of St. Andrews in 1952. He spent the next two years as a research chemist with a pest control firm and the following two years as an assistant to the Nobel Prize Winner, Dr. F. Sanger. In 1956 he became a research scientist at the University of Cambridge where he obtained his Ph.D. in 1959 for his work on the structure and specificity of the proteolytic enzymes of the pancreas. Dr. Naughton then went to the United States where he spent three years in the Biochemistry Department of the Massachusetts Institute of Technology. Since 1962 he has been Associate Professor of Biophysics in the School of Chemistry at the John Hopkins University.

Mr. K. H. McIntyre has been appointed to the Division of Animal Physiology where he will study the effects of nutrition on wool growth during

Mr. K. H. McINTYRE

the reproductive cycle of breeding ewes. Mr. McIntyre graduated B.Rur.Sci. from the University of New England in 1963. Since then he has been a cattle husbandry officer with the Queensland Department of Primary Industries.

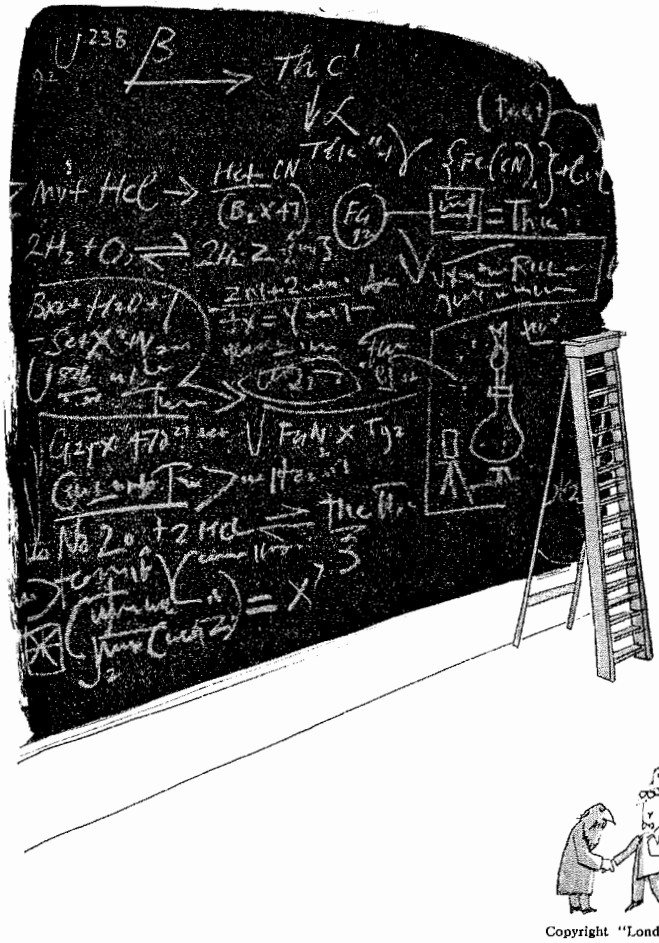
Mr. H. A. M. Sutherland has been appointed to the Division of Animal Physiology where he will investigate the development of improved methods of estimating the herbage intake of grazing animals, the factors affecting intake, and the relationship between intake and production. Mr. Sutherland graduated B.Rur.Sci. last year from the University of New England.

Mr. G. A. Richards has been appointed to the Secretariat Branch at Head Office where he will be deputy to the Officer-in-Charge of the appointments and classification

Mr. G. A. RICHARDS

section of the Staff Section. Mr. Richards will be concerned with the appointment, classification and promotion of professional and technical staff. After graduating B.Sc. from the University of Melbourne in 1955 and Dip.Ed. from the same university in 1956, he spent seven years as a physics teacher with the Victorian Education Department. For the last eighteen months he has been senior training officer in the Industrial Relations Branch of the Ford Motor Company of Australia.

Dr. P. C. Whiteman has been appointed to the Division of Tropical Pastures where he will study the environmental physiology of pasture legumes. Dr. Whiteman graduated B.Agr.Sc. with honours from the University of Queensland in 1960 and M.Agr.Sc. from the same university in 1962. Since then he has been working at the Botany Department of the Hebrew University, Israel, where he recently obtained his Ph.D. for research on resistances to water vapour and carbon dioxide exchange between the intact plant and the atmosphere.



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"Congratulations, Schrafft — a great toothpaste!"

Printed by CSIRO, Melbourne.

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CO RESEARCH

FOR CIRCULATION AMONG MEMBERS OF CSIRO STAFF — NUMBER 78, MELBOURNE, SEPTEMBER 1965

KEY POSTS FOR EXECUTIVE MEMBERS

Dr. Wark to Advise the Government

Dr. I. W. Wark, C.B.E., D.Sc., Ph.D., F.A.A., has retired from the Executive and takes up duty this week as full-time Chairman of the newly established Commonwealth Advisory Committee on Advanced Education.

Dr. Wark's main responsibility will be to recommend the distribution of funds to colleges of advanced education. He will be assisted by a small group of part-time members.

The establishment of the new committee, and the appointment of Dr. Wark to head it, were announced on August 8th by the Minister-in-Charge of CSIRO (Senator Gorton).

Senator Gorton said the committee would make recommendations on the distribution of funds available for educational projects of both a capital and recurrent nature.

The projects would first have to be recommended by institutes of colleges or State Governments and accepted by the Commonwealth as suitable subjects for support in colleges of advanced education.

Dr. I. W. WARK

Senator Gorton said the Commonwealth decision to assist the States in developing advanced education facilities followed consideration of the recent Martin report on tertiary education tabled in Federal Parliament.

The Martin report had indicated there should be an enlarged Universities Commission to advise on matters concerning universities, technical colleges and teacher training colleges.

However, the Government had decided instead to establish the Commonwealth Advisory Committee on Advanced Education.

As the Prime Minister, Sir Robert Menzies, announced in March, the Federal Government will spend £24 million over three years for "higher education colleges, providing courses to diploma level". The States, for their part, are asked to find £34 million.

The Government will make preliminary grants totalling £2,500,000 toward the new colleges this financial year.

The colleges will, in many cases, be developed from and around the tertiary sections of existing technical colleges in the States.

One of the committee's principal tasks will be to encourage their development, not only in technology, but also in the liberal arts.

Dr. Wark has rendered outstanding service to CSIRO over the past 26 years.

After a distinguished research career in Universities and in industry, he was entrusted with the formation of CSIR's Division of Industrial Chemistry in 1939.

Under his leadership the Division rapidly grew into a flourishing centre for research in pure and applied chemistry.

In 1958 the laboratory was divided into six independent Divisions and Sections, known corporately as the Chemical Research Laboratories.

Dr. Wark was Director of C.R.L. until his appointment to the Executive in 1960.

Dr. Wark brought to the Executive a wide knowledge of the physical sciences and a keen appreciation of the problems of Australian industry.

He has strongly urged the encouragement of research in industry, and the strengthening of industrial sophistication to improve Australia's export position.

In recent years many honours have been conferred upon him.

He has been elected President of the Royal Australian chemical Institute (1957-58), Treasurer of the Australian Academy of Science (1959-63), an Honorary Member of the Australasian Institute of Mining and Metallurgy (1960), and a Fellow of University College, London (1965).

Dr. Wark was created C.B.E. in 1963 for his outstanding services to science.

Appreciation

One of Dr. Wark's former colleagues at the Chemical Research Laboratories contributes the following.

My earliest recollection of Dr. Ian Wark was at a time — 30 years ago now — when he was the leader of a small industry-supported research group occupying a laboratory under the stairs in the old Chemistry School building at the University of Melbourne.

In retrospect it is easy to see that these circumstances contained most of the elements of his future career.

Ian Wark is by nature an academic, but an academic convinced that science should be practised with an eye to its ultimate use; he has always believed that there were advantages in close liaison between researchers in institutional and industrial laboratories and those in universities; he possesses to this day an ability to ignore any distracting activity or noise around him when concentrating on a problem; he displays a dedication to science and to his principles and objectives which is perhaps his most outstanding characteristic

His decision in 1939 to join CSIR as its Chief Chemist and to sacrifice the further embellishment of his substantial reputation as a physical chemist must have been determined by a conviction that Australia needed a major establishment directed to the chemical requirements of a developing nation.

The creation of the Division of Industrial Chemistry and its development into a group of Divisions as the Chemical Research Laboratories required vision and dedication; the success of the operation is demonstrated by the fact that the laboratory has enjoyed a world-wide reputation of no mean order for many years.

This was achieved only because Ian Wark understood the central importance of recruiting and holding first-class staff rather than simply filling a vacancy in the establishment. He made colossal efforts, often in the face of unnecessary handicaps, to provide funds and facilities to enable his research staff to perform creatively and efficiently.

By nature reserved — almost to the point of shyness in his earlier years — he was a source of encouragement and counsel to the frustrated and depressed researchers who always went to him when things were going wrong; he suffered the outbursts of his "bunch of prima donnas" with tolerance and tact; he arbitrated disputes with fairness and firmness.

His efforts on behalf of his staff went far beyond the specification of his responsibilities. Yet with all his concern for his staff he accepted Spartan and in fact quite substandard conditions for himself.

Ian Wark is as dedicated to his relaxations — fishing and golf — as he is to his professional activities.

In fishing he is a purist; anyone using anything but a fly to attract the attention of a trout is nothing less than a barbarian.

He practised his golf swing assiduously during lunch hour at Fishermen's Bend up to the day his No. 3 iron inadvertently entered the ladies' rest room through a closed window.

Throughout his career with CSIRO he has contributed with effectiveness and distinction to many scientific and related activities — the Royal Australian Chemical Institute, ANZAAS, the Australian Academy of Science, the National Committee for Chemistry and IUPAC, and committees concerned with scientific manpower, technical education, salaries of scientists, etc.

Ian Wark's interest in technological education is of long-standing and it is appropriate that he should have been chosen as the architect of the development of non-university advanced education in this country.

All his friends and colleagues wish him every success in his new post, and are confident that he will fill it with distinction.

Lord Casey's High Office

Lord Casey, P.C., C.H., D.S.O., M.C., will resign from the Executive this month to become Governor-General of Australia.

Lord Casey's association with CSIRO goes back to 1937, when he was first-appointed Minister-in-Charge of CSIR.

He relinquished the post shortly after the outbreak of the war to fill a series of important posts — Australian Minister to Washington, Member of the British War Cabinet (resident in the Middle East) and Governor of Bengal.

Lord Casey was re-elected to the House of Representatives in 1949 and once again became Minister-in-Charge of CSIRO.

He retained the portfolio until 1960, when he was elevated to the peerage.

Lord Casey then became a part-time member of the CSIRO Executive.

He immediately established an office at 314 Albert Street and began to improve his knowledge of the Organization.

During the last five years Lord Casey has taken a keen interest in the policies and achievements of CSIRO and of Australian science generally.

He has interested himself in many of the facets of work at Head Office, in the radio-telescope project, the Freedom from Hunger Campaign, and the Commonwealth Scientific Committee.

LORD CASEY

He has spoken at laboratory openings and field days and has even contributed to "Co-research".

Since his elevation to the peerage Lord Casey has made annual visits to Britain.

He has spoken every year in the House of Lords on the Commonwealth, on aviation, population control, and other subjects encompassed by his wide-ranging interests.

At a farewell cocktail party at Head Office last month, Sir Frederick White and Mr. G. B. Gresford paid tribute to Lord Casey's service to CSIRO and expressed the pleasure that all members of CSIRO felt in his appointment.

Lord Casey, in thanking the speakers, said that he intended to maintain his interest in the Organization, and hoped that during his term of office he would be able to see the results of CSIRO research being applied in many parts of Australia.

Over 800 people attended the CSIRO Ball at the Royale Ballroom, Melbourne, on August 5th. Mr. J. E. Cummins (left) presented a sash, a bouquet and a cosmetic gift pack to the Belle of the Ball, Miss Judy Cusworth of the Melbourne Regional Adminstrative Office. On the right is Miss Cusworth's partner, Mr. Dennis Basso.

SENATOR GORTON OPENS TOWNSVILLE LABORATORY

On Tuesday, 27th July, the Minister-in-Charge of CSIRO (Senator Gorton) officially opened the Pastoral Research Laboratory at Townsville.

The fully air-conditioned laboratory, recently completed at a cost of £180,000, was occupied only a week before the opening.

In his address to the 200 assembled guests, Senator Gorton said that the tropical pasture research based on Townsville would bring benefits to many developing countries as well as to Australia.

He said that Queenslanders would benefit particularly from the research, since it was estimated that some 260 million more acres in the State could support improved pastures.

But the overall benefits could extend right across dry tropical Australia and to overseas countries.

There were grounds for believing that, if the research programme was successful, cattle turn-off could be increased tenfold.

Even if this aim was never reached, and turn-off was only doubled, this would still be of immense significance to the growth of Australia.

Senator Gorton said that the new laboratory worked in close conjunction with "Lansdown", the 7,000 acre experiment station nearby. Each was of great importance to the other.

He had visited the station and had been greatly impressed with the enthusiasm of the scientists and the practical nature of their work.

The solution of one problem, he said, often poses another.

If the indications for development turned into reality, Australia's demand for superphosphate could double. The need to discover desposits of rock phosphate might then be as important as the need to discover oil.

Dr. I. W. Wark, in introducing the Minister, said that the staff of the new laboratory had a difficult task before it.

They were alone in the world. Theirs was the only laboratory so far established to concentrate on the improvement of pastures in the tropics.

It was an especial pleasure, he said, to have the Minister to open the laboratory.

Senator Gorton had authorized the project as Minister-in-Charge of CSIRO and had got it built as Minister for Works.

He hoped that Senator Gorton would take a good deal of pride and satisfaction in the laboratory.

The opening concluded with an address of thanks to the Minister by the Chief of the Division of Tropical Pastures, Dr. J. Griffiths Davies.

Dr. Davies said he had every reason to feel optimistic about the future of the laboratory.

He had not been to Townsville for 15 months and was amazed to see what a good start had been made at Lansdown.

The Government had provided a laboratory, a field station, and the wherewithal to collect a staff.

He was confident that the staff were making, and would continue to make, good use of their opportunity.

Senator Gorton and Mr. L. A. Edye (right) discuss pasture ecology research with Dr. P. Gillard (centre).

SCHOOL FOR RAINMAKERS

Eight delegates from Queensland, New South Wales, Victoria and A.C.T. attended a "School for Rainmakers" at the Division of Radiophysics last month.

The course embraced basic meteorology and the study of rain processes, seeding techniques, and their applications to drought and bushfire relief.

Here at Murraybank field station near Sydney, a group watches a demonstration of ice nuclei being produced.

A silver iodide generator passes solution to a combustion chamber where it is vaporised and burned. The resulting crystal smoke is then sucked through a diffusion wind tunnel and then passed to the atmosphere.

This demonstration approximates what happens when the generator is used on the seeding aircraft.

Some minutes after the burner was switched off members saw evidence of the seeding when a refrigerated chamber was opened in a nearby hut and countless ice crystals were seen to grow.

In the picture are, from left to right, Mr. Frank Skinner of the Queensland Department of Primary Industries, Mr. Garry Campbell, N.S.W. Department of Agriculture, Mr. Athol Hodgson, Victorian Forestry Commission, and, in the foreground, Mr. E. J. Smith of the Division of Radiophysics.

Crystal Conference

Four hundred leading scientists from twenty-seven countries gathered at Melbourne University on August 16th for an International Conference on Electron Diffraction and Crystal Defects.

The conference was sponsored by the Australian Academy of Science and was organized by the International Union of Pure and Applied Physics and the International Union of Crystallography.

Dame Kathleen Lonsdale, F.R.S., was President of the Conference, and delivered the Bragg lecture on August 17th.

Among the distinguished visitors were several of the early pioneers in the field, including Professor P. P. Ewald, Dr. L. H. Germer and Dr. M. Blackman. Dr. F. Seitz, President of the American Academy of Sciences, was also present.

Several CSIRO scientists were involved in the organization of the conference. Dr. W. Boas (Tribophysics) and Dr. A. McL. Mathieson (Chemical Physics) were members of the Organizing Committee.

Dr. A. D. Wadsley (Mineral Chemistry), Dr. A. F. Moodie (Chemical Physics), Dr. J. S. Dryden (Applied Physics) and Dr. J. V. Sanders (Tribophysics) were all members of the programme committees.

During the conference the CSIRO Film Unit made a half hour colour film of how X-ray diffraction has led to an understanding of the structure of crystals and of their defects.

The conference provided a golden opportunity to get many of the pioneers of the subject together at one place and at one time.

In the film, several of the older men recall their early breakthroughs.

An exhibition of £250,000 worth of scientific equipment was held at the University in conjunction with the conference.

Dr. E. G. Bowen, Chief of the Division of Radiophysics, opened the exhibition.

Dr. Bowen praised the work of Australian manufacturers of scientific instruments.

They had not merely imitated overseas designs, but had shown the initiative and confidence to back locally designed equipment, he said.

"It is a truism that the appearance of sophisticated measuring instruments always marks a turning point in the growth of scientific activity in any country," he said.

Fisheries Ball

The Division of Fisheries and Oceanography held its Annual Ball at the "Astron" on June 25th. The 120 guests included several people from the Sydney Administrative Office.

Left to right: Mrs. Ron Potent, Mrs. and Mr. Stan Ryan, Dr. G. L. Kesteven, Mr. J. Rawlings and Mr. Ron Potent.

DEATH OF DR. HEDLEY MARSTON

Dr. Hedley Ralph Marston, Chief of the Division of Biochemistry and General Nutrition, died in Adelaide on August 25th after a short illness.

Dr. Marston was born in Bordertown, South Australia, on 26th August, 1900.

In 1919 he was an honours-degree student in chemistry at the University of Adelaide when a chance encounter with Professor T. Brailsford Robertson, Professor of Biochemistry and General Physiology, re-directed his interest towards experimental physiology.

He became Professor Robertson's Demonstrator of Biochemistry, and for ten years was closely associated with and profoundly influenced by his teaching and research activities.

In 1927 the newly formed CSIR asked Professor Robertson to form a Division of Animal Nutrition to investigate nutritional problems associated with merino sheep.

Dr. Marston transferred to the Division and acted as its Chief in the interval between Professor Robertson's untimely death in 1930 and the appointment later that year of Sir Charles Martin, F.R.S., who had just retired from the Directorship of the Lister Institute in London.

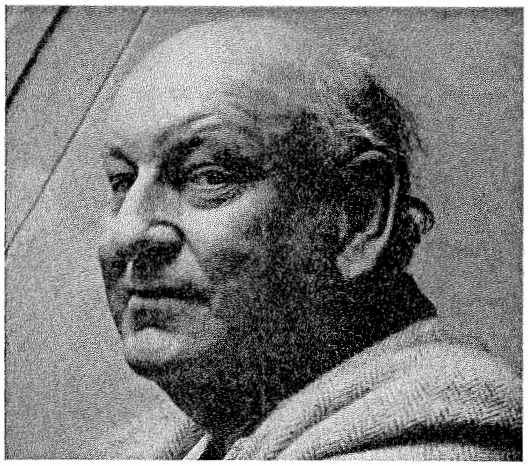
In 1932 Sir Charles returned to London and the Division of Animal Nutrition was amalgamated with the Division of Animal Health under one Chief, Dr. L. B. Bull.

Dr. Marston was appointed Chief Nutrition Officer and Officer-in-Charge of the Animal Nutrition Laboratory.

During 1936-37 he worked at the Biochemical Laboratory, Cambridge, at the invitation of Sir Frederick Gowland Hopkins, F.R.S., on the energetics of the fermentative reactions that take place within the ruminant's paunch.

In 1944 the Laboratory was again accorded the status of an independent Division, the Division of Biochemistry and General Nutrition, and Dr. Marston was appointed Chief.

Under him, the Division developed into an outstanding research institute for the study of the physiology, biochemistry and nutrition of ruminants, and of the wool sheep in particular.



Dr. H. R. MARSTON

Dr. Marston's research was mainly in the fields of energy metabolism and thermodynamics of food utilization by ruminants; of nutrition and wool production; of the importance of cobalt and copper for ruminant nutrition; and of the nutritional physiology and metabolic function of the cobalt-containing vitamin B_{12}.

He was elected a Fellow of the Royal Australian Chemical Institute in 1938 and a Fellow of the Royal Society of London in 1949.

He was a Foundation Fellow of the Australian Academy of Science and was its first Treasurer from 1954-1955.

In 1957 the Australian National University conferred upon him its first degree of Doctor of Science *honoris causa* and, in 1959, he was admitted to the degree of Doctor of Science of the University of Adelaide.

Dr. Marston was awarded the ANZAAS Mueller Medal in 1959 and in the same year he was the Annie Cunning Lecturer of the Royal Australasian College of Physicians.

He was elected a Fellow of the Australian Society of Animal Production in 1962.

Laboratory Craftsmen

In the hope of establishing improved liaison, and to bridge the gap between workshop staff and the Executive, the CSIRO Laboratory Craftsmen's Association has come into existence and prepares to make a public debut.

The Association's formation has progressed to a stage at which it is gaining membership and strength on a nation-wide scale and is attracting the interested attention of CSIRO staff generally.

Firmly based on well-tried methods and procedures, a Constitution has been drawn up and accepted by the majority of members.

In addition to an Association Council (the federal governing body) State branches have been formed in New South Wales, A.C.T. and Victoria, with representation in the other States.

All this adds up to a good start for the infant organization. Its coming of age will be the granting of registration by the Commonwealth Industrial Registrar through his Deputy in Sydney, thereby giving the Association status as an Industrial body.

This earnestly sought event, we hope, is not far distant. The Association's legal advisers in Sydney have the matter in hand and are working for the attainment of our objective.

In the meantime, it is strongly recommended to CSIRO Workshop staffs everywhere to inquire into and seek membership of the Association.

In New South Wales, contact Mr. Arthur Frost, who is State Secretary and can be found at the Division of Textile Physics, Ryde, Sydney. The man in Canberra is Mr. Sid Jackson at the Division of Entomology. In Victoria, Mr. E. Hindell at the Chemical Research Laboratories is looking after our interests at the moment. Mr. R. Morelly, the General Secretary, is at the Division of Applied Physics, Sydney.

These men are actively working in the Association's interests and are able to handle any inquiries that may be directed to them in their respective States.

We hope that all CSIRO workshop staff will join the new Association, and give it the support and encouragement it needs both in its present formative stage and in the future.

N.S.L. OPEN DAYS

The National Standards Laboratory held Open Days on 10th and 11th August. Over 2,500 people attended on these two days, and a large number of school children came to inspect the exhibits on 12th August.

Over 140 exhibits were on display in the main laboratory building and in the branch laboratory at Newtown.

Among the exhibits was a new piece of equipment for the absolute measurement of gravity. The apparatus, which is still in the experimental stage, tosses a cornercube (a half cube with highly reflecting internal surfaces) into the air.

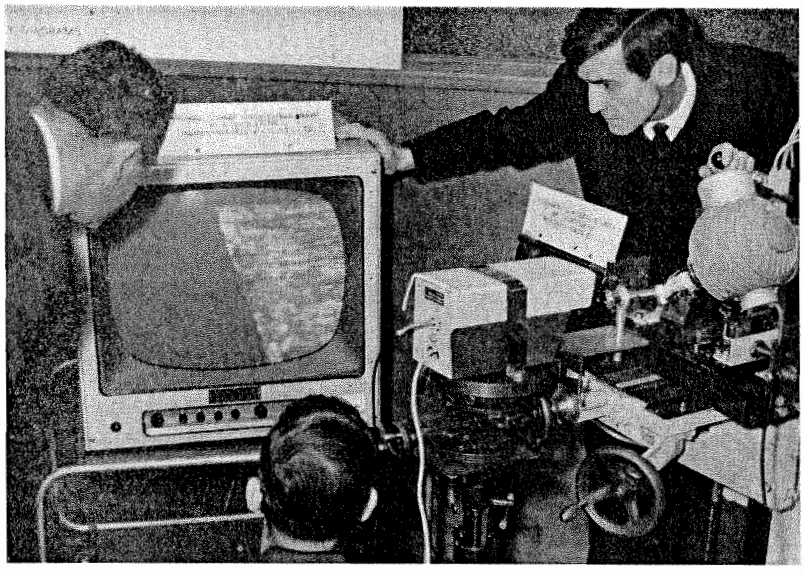
Interferometers are used to measure the time-lapses which occur as the body moves up and down under gravity past two reference points. It is expected that an accuracy of 1 part in a million will be achieved with this equipment.

This considerably improved accuracy will, in turn, help the laboratory to establish more exact measurement of secondary standards such as force and pressure.

Other exhibits on display included:

- A new method of observing the Sun in a narrow band of light frequencies. Servo-controlled Fabry-Perot interferometers, used in series, act as a narrow-bandpass filter. It is capable of being tuned to a desired wavelength.
- A means of absolute determination of optical radiation. Radiant energy from a light source falling on a black surface is measured by means of a thermopile. The surface may then be heated electrically and the energy inputs compared.
- Means of improving the visibility of painted white lines on the road. When very small glass beads are sprinkled on a white line on a roughened road surface there is a dramatic increase in visibility on both wet and dry roads.
- New equipment for calibrating transformer testing sets. High voltages are normally transformed down to small, more easily measured voltages before being compared to standards. The transformer's reduction must therefore be known very accurately.
- A device for giving a warning signal when a mobile crane approaches a power line. Crane operators working in confined spaces have on occasions made contact with high tension power lines, usually with fatal results.

Closed circuit television display of a demonstration of the plasticity of metals under machining conditions. With a microscope objective fitted to the camera Mr. Warren Hastings (Applied Mechanics Section) shows a greatly enlarged image of a cutting tool on the screen.



News In Brief

Doctorates

Dr. J. M. Swan, of the Division of Organic Chemistry, has been awarded the D.Sc. degree of the University of Melbourne. The degree was awarded for a thesis entitled "Studies on the Chemistry of Proteins, Peptides and Amino-Acids".

Mr. R. Postle, of the Division of Textile Physics, has been awarded the degree of Ph.D. by the University of Leeds, for his work on the geometry of the knitted structure.

Mr. D. Bouma, of the Division of Plant Industry, has been awarded the degree of Doctor of Agricultural Science by the State Agricultural University, Wageningen, Netherlands. His thesis was entitled, "Growth changes of plants following the removal of nutritional stress". Dr. Bouma was awarded a CSIRO Divisional Traineeship in 1964 and he is now at Wageningen working under Professor A. C. Schuffelen in the Department of Soils and Fertilizers of the University.

Honoured

Dr. W. Boas, Chief of the Division of Tribophysics, has been elected a Foreign Scientific Member of the Institute for Metallforschung of the Max Planck Gesellschaft in Germany. Dr. Boas worked in the Institute from 1928-32.

Rivett Lecture

The second David Rivett Lecture will be given in Canberra on 21st October. The lecturer will be Lord Adrian, a distinguished physiologist. Lord Adrian, who is 75, won the Nobel Prize in 1932. He is a former President of the Royal Society.

Computer Symposium

A symposium on the use of computers in medicine and biology sponsored by IBM Australia Pty. Ltd., will be held in the Department of Physiology of the University of Melbourne on October 28th-29th.

It is the object of the symposium to provide a forum for presentation of papers and detailed discussion.

This should enable investigators in the fields of medicine and biology who are relatively inexperienced in the use of computers to obtain a better understanding of the possible help which this new discipline may provide in their studies as well as to review present achievements and future trends for the more experienced worker.

Further details may be obtained from the Hon. Secretary, Dr. A. Shulman, C/- Department of Physiology, University of Melbourne, Parkville, N.2, Victoria.

Ball in Sydney

On the 8th October, Sydney Divisions and Sections are holding their first Annual Ball, at the Sky Lounge, Liverpool Street, Sydney.

Miss Jan Newton, of the Sydney Regional Administrative Office, is organizer-in-chief.

Parties are coming from all Divisions — some from as far afield as Camden, 40 miles out of the city.

A feature of the evening will be an exhibition of Scottish National dancing by a group from Textile Physics under the leadership of Gordon Stott.

This group would be pleased to hear from anybody interested in joining.

Seminar on Science Policy

Members of the staff of CSIRO are playing a leading role in a UNESCO organized Seminar now being held at St. Andrew's College, University of Sydney. The Seminar, which was opened by Sir Frederick White on 10th August, is on the subject of "Science Policy and Research Organization".

Eighteen senior science administrators, mostly from Asian countries, are attending.

The countries represented are Australia, Ceylon, Hong Kong, India, Japan, Korea, Malaysia, Nepal, New Zealand, Pakistan, Philippines, Taiwan, Thailand and Vietnam.

Mr. Leon Peres, of the CSIRO Secretariat, is Director of the Seminar. The Associate Director is Mr. A. Rahman of CSIR, India.

Several people from Head Office have given papers. They include Mr. C. S. Christian ("The Basic Role of Resources Surveys" and "Utilizing Foreign Aid"), Dr. O. H. Frankel ("Priorities in Agricultural and Biological Research") and Mr. G. B. Gresford ("National Science Policy" and "International Bodies and Aid Programmes").

Mr. D. T. C. Gillespie and Mr. L. G. Wilson gave papers on personnel administration. Mr. R. C. McVilly spoke on "Administrative Services" and Mr. W. R. Ferguson on "Designing and Constructing Research Laboratories".

Various people from CSIRO Divisions also took part. Dr. J. E. Falk (Plant Industry) and Dr. G. F. Humphrey (Fisheries and Oceanography) discussed the role of the research director.

Dr. J. R. Vickery (Food Preservation) led a discussion on the determination of laboratory programmes.

Miss Betty Doubleday (Head Office), Mr. P. H. Dawe (Soils) and Dr. G. W. Hill (Mathematical Statistics) discussed documentation and information systems, and Mr. G. R. Williams (Fisheries and Oceanography) gave a paper on laboratory services.

Several distinguished speakers from universities and other organizations also spoke at the seminar.

They included Dr. F. Seitz, President of the American Academy of Science; Sir Philip Baxter, Chairman of the Australian Atomic Energy Commission; Mr. L. Mattson, Director of the UNESCO Regional Centre for Science and Technology for South-East Asia; and Dr. V. A. M. Beerman, UNTAB representative in Australia.

The Seminar finishes on September 2nd.

Our picture shows some of the delegates relaxing at a party soon after their arrival. From left: Professor S. S. Singha (Nepal), Dr. A. Ghosal (India), Mr. Leon Peres, Dr. N. A. Khan (Pakistan) and Dr. K. Balajiva (Thailand).

From Abroad

Professor Ichiji Kawamura, Professor of Wood Chemistry in the Faculty of Agriculture, Gifu University, Japan, will arrive in Melbourne this month to spend twelve months in the Wood and Fibre Structure Section of the Division of Forest Products. He will work with Mr. D. E. Bland on the lignin of eucalypt woods. Professor Kawamura, who has worked on wood chemistry for over twenty-five years, will extend his studies on the effect of climate on the properties of hardwood lignin. Australia offers unique facilities for such a study because of its range of climate and these studies will be of special importance to the pulp and paper industry.

APPOINTMENTS TO STAFF

Mr. H. P. Black has joined the public relations staff of Head Office and will be stationed at the Executive Office in Canberra. From 1956-61 he was on the staff of the Antarctic Division of External Affairs. He has spent two periods in

Mr. H. P. BLACK

the Antarctic with A.N.A.R.E., as Officer-in-Charge at Macquarie Island (1957) and at Wilkes (1960). Since 1961 he has been Public Liaison Officer of the National Capital Development Commission.

Mrs. V. Elder has been appointed to the staff of the Division of Soils, and will be stationed in Canberra. As Valerie Goldsmith, she was on the staff of the Division of Forest Products from 1947 until 1964. In 1952 she completed a diploma in applied physics at the Royal Melbourne Institute of Technology. Later she spent a year in Britain working at the British Paper and Board Industry Research Association.

Mr. A. Low has been appointed to the Irrigation Research Laboratory at Griffith as a cotton breeder. After leaving school in 1943 Mr. Low served for three years with the East African Engineers in India and Ceylon. After the war he spent two years as a surveyor with the Tanganyika Railways before entering the University of Aberdeen, where he graduated B.Sc. with honours in 1952. Since graduation he has worked in the Sudan and Uganda with the Empire Cotton Growing Corporation.

Dr. J. K. Palmer has been appointed to the Division of Food Preservation where he will study the ripening of fruit and its behaviour during storage. Dr. Palmer graduated B.S. from Juniata College in 1948, M.S. from Pennsylvania State University in 1950, and Ph.D. from the same University in 1953. From 1952 to 1956 he worked at the Connecticut Agricultural Experiment Station and from 1956 to 1959 at the Virginia Institute for Scientific Research. For the last six years he has been Senior Biochemist in the Central Research Laboratory of the United Fruit Company.

Dr. P. M. Robinson is at present en route from Boston to take up a Research Fellowship in solid state physics at the Division of Tribophysics. After graduating Ph.D. from the University College of South Wales and Monmouthshire he came to Australia to spend three years at the Central Research Laboratories of John Lysaght (Australia) Ltd. at Newcastle. Since 1962 he has been working as a Research Associate in the Department of Metallurgy, Massachusetts Institute of Technology.

Dr. N. S. Scott has been appointed to the staff of the Plant Physiology Unit, Division of Food Preservation. Since graduating in agricultural science from the University of Adelaide in 1961 he has been working for his Ph.D. degree at the Waite Institute.

Mr. K. R. Bootle has been appointed to the Division of Fisheries and Oceanography where he will be responsible for the editing of scientific papers and the preparation of technical reports. Mr. Bootle

Mr. K. R. BOOTLE

graduated B.Sc. from the University of Sydney in 1945. For the last fifteen years he has been with the Forestry Commission of New South Wales, firstly as a country liaison officer, and then as utilization officer in the division of wood technology.

OVERSEAS VISITS

Mr. R. H. Clarke, of the Division of Meteorological Physics, left Melbourne on 11th August for an extended visit to the U.S.A. The main purpose of Mr. Clarke's visit will be to work with Dr. J. Smagorinsky in the Geophysical Fluid Dynamics Laboratory of the U.S. Weather Bureau in Washington. En route to Washington he will spend a month working with Professor C. W. Newton and H. van Leon of the National Center for Atmospheric Research, Boulder, Colorado. Mr. Clarke will also spend five months visiting a number of places of interest in Europe and plans to return to Melbourne in December, 1966.

Dr. J. A. Barker, of the Division of Physical Chemistry, leaves next week for a 12 weeks visit to Britain, Europe, and North America. He will investigate trends in theoretical chemistry and physics related to the work of the Division.

Mr. K. A. Harper, of the Division of Food Preservation, left last month for Scotland, where he will spend a year in the Department of Food Science at the University of Strathclyde, Glasgow. The visit is being made under an exchange arrangement, whereby Dr. Margaret Cragg, of the University staff, will spend a year with the Division of Food Preservation.

Mr. L. S. Herbert, of the Division of Chemical Engineering, left last month for a four months visit to Kuwait, Israel, Britain and North America. He will visit several laboratories interested in water desalination and see some working installations. Mr. Herbert will attend a conference on water desalination in Washington next month.

Dr. W. J. Scott, Assistant Chief of the Division of Food Preservation, left recently on a three months visit to North America, Britain and Europe. He will visit a number of meat research laboratories and attend conferences on public health and veterinary science at Nebraska, U.S.A., and Belgrade.

Mr. E. N. S. Trickett, of the Irrigation Research Laboratory, Griffith, leaves this week for a seven months visit to Britain and the United States. He will attend a symposium on "Plant Environment in Glasshouses" at the National College of Agricultural Engineering, Silsoe, and then work for a few months with British Telecommunications Research Ltd. at Taplow, Berks.

The Division of Land Research and Regional Survey held a Cabaret Ball at the Coach House Motor Inn, Canberra, on Friday, 13th August. Several people from the Division's three research stations in northern Australia were in Canberra for the Division's Annual Meeting. Above (left to right): Mr. G. R. Chaplin (Coastal Plains Research Station), Mrs. J. Davey (Canberra), Mr. J. Davey, Miss J. I. M. Young (Secretary to the Chief). (Photo by courtesy "Canberra Times".)

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CORESEARCH

FOR CIRCULATION AMONG MEMBERS OF CSIRO STAFF — NUMBER 79, MELBOURNE, OCTOBER 1965

MR. IVES JOINS EXECUTIVE

Mr. Walter Ives has been appointed to the Executive. He replaces Dr. I. W. Wark who retired recently from the Executive and took up duty as Chairman of the newly-established Commonwealth Advisory Committee on Advanced Education.

Mr. Ives began his career in 1934 as a messenger with the Australian Gas Light Company in Sydney.

He studied commerce part-time at the University of Sydney, graduating B.Ec. in 1938 and M.Ec. in 1942.

In 1939 he joined the Bank of New South Wales as a research officer in agricultural economics.

In 1942 he was appointed to the Rural Industries Division of the Department of War Organization and Industry where he was engaged in inquiries associated with proposals for the wartime rationalisation of the wheat industry.

During 1944-45 he was Secretary of the Interdepartmental Committee on Production Goals which was responsible for recommending the production targets to be established for the major primary industries and the steps needed to achieve these targets.

At the end of the War he became a senior research officer in the Bureau of Agricultural Economics, and in 1946 he joined CSIRO as Technical Secretary of the Division of Plant Industry.

Mr. Ives was made an Assistant Secretary at Head Office in 1949 and Secretary (Biological Sciences) in 1952.

From 1954-1956 he occupied the post of Chief Scientific Liaison Officer at the Australian Scientific Liaison Office in London.

He was appointed Executive Officer in 1959 and Associate Member of the Executive in 1962.

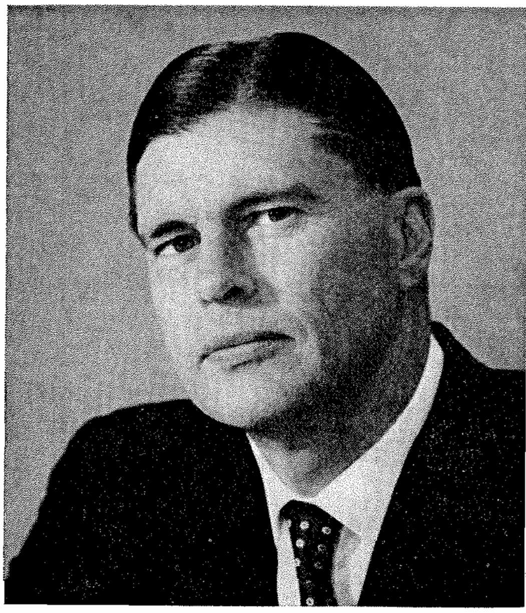
Mr. Ives is a member of the Council of the Australian Wine Research Institute and of the Australian Dairy Produce Research Committee and until recently was the Australian Liaison Officer of the Commonwealth Agricultural Bureaux.

He played a major role in the establishment of the CSIRO Computer Network and the Computing Research Section and is Chairman of the Advisory Committee on Scientific Computing.

For many years, Mr. Ives has shown a keen interest in the Australian Institute of Agricultural Science.

He was Honorary Treasurer in 1949 and President of the Victorian Branch in 1962-63, and was closely associated with the establishment of the Australian Journal of Experimental Agriculture and Animal Husbandry.

He has been Chairman of Directors of the CSIRO Co-operative Credit Society since its formation in 1957 and has taken a very active interest in it.



Mr. W. IVES

PROFESSOR BADGER TO RESIGN

Professor G. M. Badger has announced his intention of retiring from the Executive next January to become Deputy Vice-Chancellor of the University of Adelaide.

Professor Badger joined the Executive just over a year ago and his career up till that time was described in Coresearch No. 64.

His year with CSIRO has been a busy one. First and foremost, he has spent a great deal of time getting to know intimately those Divisions and Sections for which he has special responsibility.

As a former educationist, Professor Badger has been keenly interested in the training of research workers. He has been Chairman of the CSIRO Studentship Committee and an advocate of closer relationships between CSIRO and the Universities.

Professor Badger has served as a member of the Building Research Advisory Committee and the Executive Buildings and Works Committee. He has undertaken negotiations with the Public Service Board and the National Capital Development Commission over the proposed move of Head Office to Canberra.

His other interests have included public relations. He has spoken about CSIRO to a number of audiences and on the radio and he has urged improvements in our Annual Report.

Professor Badger has found time to fill two public offices during his term with CSIRO. He has been President of the Royal Australian Chemical Institute, and a member of the Government's Research Grants Committee.

POSITIONS VACANT

The following vacancies for professional appointments are current:

SCIENTIFIC SERVICES OFFICER (SSO 1/2) — CHEMIST/BIOCHEMIST—Division of Animal Physiology 245/320 (8/10/65).

RESEARCH SCIENTIST (RS/SRS) PHYSICIST—Division of Applied Physics 750/344 (8/10/65).

RESEARCH SCIENTIST (RS/SRS) — Division of Entomology 180/326 (8/10/65).

SCIENTIFIC SERVICES OFFICER (SSO 3/4)—Agricultural Liaison Unit 117/89 (15/10/65).

EXPERIMENTAL OFFICER (EO2/3)—Division of Physics 770/303 (15/10/65).

RESEARCH SCIENTIST (RS)—Division of Tropical Pastures 850/240 (15/10/65).

RESEARCH SCIENTIST (RS/SRS)—Soil Mechanics Section 920/68 (29/10/65).

RESEARCH SCIENTIST (SRS/PRS)—Division of Animal Genetics 682/28 (29/10/65).

RESEARCH SCIENTIST (SRS/PRS)—ECONOMIC BOTANIST—Division of Plant Industry 130/730 (29/10/65).

RESEARCH SCIENTIST (RS/SRS/PRS)—GEOMORPHOLOGIST—Division of Land Research 618/180 (31/10/65).

RESEARCH SCIENTIST (RS/SRS)—POSTDOCTORAL FELLOWSHIP IN ELECTRON MICROSCOPY—Division of Protein Chemistry 462/236 (12/11/65).

Spending on Research

Last month the Division of Plant Industry held the first of a series of six seminars on policy making for science and technology.

The seminar, which was led by Dr. I. Ross of the Department of Chemistry at Sydney University, looked critically at Australia's "balance sheet" of scientific research.

Three possible criteria for measuring research activity were examined:

- amount spent on research
- size of research body
- research output — for example, number of scientific papers produced.

It was felt that each of these was inadequate on its own but that the first two, if taken together, could give some sort of worthwhile measure of research activity.

Some of the problems involved in defining research expenditure and in obtaining estimates of it were discussed.

By dividing the research expenditure of various organizations by numbers of research workers, Dr. Ross arrived at the following comparative figures of "cost per research scientist per annum": CSIRO £20,000; Industry £8—12,000; Universities £7,000.

Several speakers questioned the validity of such a direct comparison, pointing out that Universities were able to choose their own areas of research whereas bodies such as CSIRO were obliged to undertake research in certain definite fields, some of which demanded very high expenditures.

It was estimated that the number of research workers in Australia was roughly: Government 3,000; Industry 500-1,000; Universities 1,400 staff plus 1,200 graduate students.

To date, about one thousand people had obtained their Ph.D.'s in science in Australia.

The following table shows, on a percentage basis, the different fields of science in which the Ph.D.'s were awarded.

Mathematics	3
Physics	16
Chemistry	25
Biochemistry	7
Geology	7
Botany	6
Zoology	6
Other biological	6
Agricultural	6
Veterinary	3
Engineering	10
Materials science	2
Other	3

About 150 people a year were now graduating Ph.D. from Australian universities and this figure was expected to double in five years' time.

In spite of this Australia was still drawing heavily on other countries for its scientific manpower.

It was estimated that the cost of producing a Ph.D. ranged from £20,000 to £50,000.

The following table was also presented which analyses on a percentage basis the place of employment of Australia's Ph.D.'s.

Government establishments	11
Industry	4
Universities	48
Permanent overseas	20
Overseas post-doctorates	10
Other	7
	100

The University sector was further dissected as follows:

Home University	31
Another University in same State	4
Interstate University	13
	48

It was pointed out that the system was intensifying itself because one third of all senior graduates were returning to their old University.

The expected doubling of the annual Ph.D. rate in five years seemed to portend a surplus in some fields unless there was an unusually strong demand from the industrial sector.

There was, however, little sign at this stage of such a demand developing.

Concrete Expert

Dr. S. Rosenhaupt, a structural consultant and former Head of the Structures Section of the Israeli Institute in Haifa, is at present spending three months with the Division of Building Research to advise on research into the structural properties of concrete masonry.

Dr. S. ROSENHAUPT

Dr. Rosenhaupt is a world authority in this field. His visit has been made possible by a grant from the Cement and Concrete Association of Australia.

Institute Fellows

Dr. R. M. Moore, Assistant Chief of the Division of Plant Industry, and Mr. N. H. Shaw of the Division of Tropical Pastures have been elected Fellows of the Australian Institute of Agricultural Science.

Dr. Moore's fellowship was in recognition of his research on weeds, pastures, and livestock grazing systems.

He pioneered studies of the ecology of weeds and of their control by ecological methods. He also undertook the first complete study of grazing systems and their effects on animal and pasture production.

Mr. Shaw's fellowship was in recognition of his services to the pastoral development of the spear grass region of Queensland, to the development of agrostology in northern Australia, and to the Institute.

His research in the spear grass region showed that beef-production could be increased five-fold by including Townsville lucerne in native pastures, and ten-fold by using fertilizer as well.

£19,238,000 FOR CSIRO

CSIRO will have a total Budget for 1965/66 of £19,238,000 for capital and non-capital expenditure of which £14,681,000 will be provided directly by the Government, and £4,557,000 by Industry Committees and other contributory sources.

Treasury Funds

Of the amount of £14,681,000 provided under the Treasury Appropriation £12,800,000 is for salaries and running expenses, £1,778,000 for capital expenditure and £103,000 for repairs and maintenance of buildings.

The allocation for salaries and running expenses represents an increase of £597,589 over the expenditure in 1964/65.

Inescapable salary increases arising from increments, reclassifications, and new salary determinations, will absorb £227,000, leaving £370,589 available for other purposes.

Of the latter amount, the Executive had to provide a sum of £139,000 to meet commitments concerned with:

- Cabinet decisions relating to the Coastal Plains Research Station at Darwin and the Pasture Research Laboratory at Townsville.
- Increases in grants to the Standards Association of Australia, National Association of Testing Authorities and minor international associations.
- Additional maintenance expenditure by way of service charges in respect of new accommodation.

Two new projects including 14 positions approved this year account for £30,000. The projects are pest management (Division of Entomology) and cattle pastures research (Division of Tropical Pastures).

The remaining £201,589 has been used by the Executive to meet increased expenditure on current research activities:

- To raise maintenance allocations and provide for computer time.
- To provide for increases in overtime and the employment of vacation students.
- To finance 136 new positions.

Apart from the additional positions for new projects, expansion of current activities (a total of 150), and the new positions associated with Cabinet decisions, a further 58 positions without funds have been provided for staff who have been employed for some years as "temporaries".

The capital allocation from the Treasury is divided into two categories — those items controlled by CSIRO and those handled by the Departments of Works and Interior.

The first group absorbs £645,000. This will be spent mainly on the development of field stations (£190,000), scientific computing equipment (£130,000), and the purchase of major items of equipment each costing over £5,000 (£315,000).

Of the sum of £1,017,000 provided for projects under the control of the Department of Works, £800,000 will be needed for buildings under construction.

An amount of £36,000 has been provided in the vote of the Department of the Interior for the acquisition of sites and buildings for CSIRO during 1965/66.

Other Funds

The joint Commonwealth/Industry Research Funds provide the major portion (£3,497,000) of the funds made available to CSIRO from non-Treasury sources.

The Australian Wool Board has allocated £2,797,503 comprising £1,517,403 for wool production research and £1,280,100 for wool textile research.

The allocation for wool production research is made up of £1,446,203 for annual running expenses and £71,200 for capital items.

The provision for annual expenditure represents an increase of £53,300 (about 4%) over the amount made available for this purpose in 1964/65.

Inescapable salary increases absorb about £35,000, the balance being available to meet increased needs for travelling and maintenance.

The Wool Board has recommended to the Minister for Primary Industry that 13 new positions be allocated to CSIRO for wool production research.

No decision has yet been given on the Board's submission and at this stage no funds have been included in our 1965/66 Estimates for this purpose.

The provision (£71,200) for capital expenditure is £74,900 less than the 1964/65 allocation and it will be used for several small building projects and developmental expenditure.

The amount allocated for wool textile research comprises £141,900 for salaries and annual running expenses, including 22 new appointments and £138,200 for capital expenditure.

The allocation for annual expenditure represents an increase of £50,000 (about 5%) on the amount provided for 1964/65; approximately £18,000 of this sum is needed for salary increases.

The capital provision of £138,000 is £25,000 more than the amount provided in 1964/65; £99,000 of this will be spent on textile processing plant and the balance on minor buildings, small works and some major items of laboratory equipment.

Grants for cattle and beef research total 395,000. Of this sum £120,700 is for projects associated with tick research including £75,100 for the development of field station facilities in Queensland.

An amount of £109,500 has been allocated from the Dairy Research Trust Account for projects associated with dairy farm and dairy manufacturing research.

Grants for wheat research and tobacco research projects total £100,000 and £95,000 respectively.

Sigus Around Melbourne. Number one of a series by Building Research photographer Eric Smith.

The Time of the Peacock

"The Time of the Peacock", a collection of short stories by Mena Abdullah and Ray Mathew, has just been published in Sydney by Angus and Robertson.

Miss Abdullah has been an accounting machinist at the Sydney Regional Administrative Office for the last twenty years.

She has had a number of stories and poems published in Australian newspapers and magazines, and several of her stories have been included in various anthologies.

Mr. Mathew was a clerk at the Regional office from 1953 until 1955 when he left for England where he now lives.

He has published collections of poems and short stories and has had several plays produced in Australia and England.

Reviewing the book in the Sydney Morning Herald, Thea Astley wrote: *"Reading the dozen keenly perceptive stories in this collection, one is made horribly aware that there is enormous disparity in the precise inheritance from race to race."*

"Herein lies the value of this book, which reveals in a series of family snapshots the exact nature of that inheritance as it involves a group of Punjabi Moslems settled in the Australian countryside."

"They have tried to transfer, untouched, their language, their customs, their especially moving dignity; but the crude feelers of the Anglo-Saxon personality invade and wound their unassimilated personalities which still retain after two generations the pathos of the exotic and the unaccepted."

"Inevitably, one is reminded of Tagore and, although the comparison may appear pretentious, there are certain justifications in the rhythm of the prose, the poetic repetitions, the lilt of dialogue which reproduces wonderfully the directness of children."

"It would be pleasant indeed, to think that this publication (made possible by assistance from the Commonwealth Literary Fund) could find its way into the school syllabus as a text for advanced classes."

"The quality of the writing, the suitability of the themes and the humanity of its arguments might atone a little to those teachers who have watched countless pupils writhe their way through collections like Henry Lawson's 'Fifteen Stories'."

SUMMARY OF ESTIMATES OF EXPENDITURE FOR 1965-66

	Estimates 1965-66 £	Expenditure 1964-65 £	Increase or Decrease £
Under CSIRO control			
Salaries and running expenses	12,800,000	12,202,411	597,589
Buildings, works, plant and developmental items	645,000	1,962,484	—1,317,484 (a)
Total under direct control of CSIRO	13,445,000	14,164,895	—719,895
Under Department of Interior control			
Acquisition of sites and buildings	36,000	32,286	3,714
Under Department of Works control			
Fittings and furniture	80,000	89,532	—9,532
Repairs and maintenance of buildings	103,000	92,824	10,176
Buildings, works	1,017,000	1,113,836	—96,836 (b)
Total CSIRO — Treasury Funds	14,681,000	15,493,373	—812,373
Contributory Funds			
Investigations — salaries and general running expenses	4,027,100	3,661,410	365,690
Buildings, works, plant and developmental items	529,900	419,804	110,096
Total funds CSIRO — all sources	19,238,000	19,574,587	—336,587

(a) The expenditure in 1964/65 included a payment of £1,429,645 for the major part of the equipment for the computer network. An amount of £130,000 has been provided in 1965/66 to meet the final cost of the equipment.

(b) Although the cash allocation for 1965/66 is less than the cash expenditure for 1964/65, the works programmes for both years are almost identical in terms of money. The decrease is entirely due to the anticipated date of commencement of one major project being late in the year.

From Abroad

Dr. R. Hodges, Senior Lecturer in Organic Chemistry at the Massey University of Manawatu, New Zealand, is spending nine months with the Division of Coal Research working with Dr. J. S. Shannon on mass spectrometry.

Dr. Hodges was until recently attached to the Ruakura Animal Research Station, New Zealand.

SAFETY NOTES

Most of us believe we know all there is to know about lifting, why not? We've done it all our lives. It's as simple as breathing and walking.

However, it really isn't as simple as that.

There is a right and wrong way, and lifting the wrong way can lead to serious trouble. Not only at work, but at home.

There is no fundamental difference in lifting a can of solvent from the laboratory floor or lifting junior up from the kitchen floor.

If you keep your legs straight, and lift with your back muscles, you are inviting trouble.

A strained back is very painful, and very slow healing.

Lift with your feet apart, preferably one in front of the other to give better balance.

Bend your knees and have the load between your legs. Straighten the back and look ahead, not down.

Lift with the stronger leg muscles, not the back muscles.

If the load is too heavy, get help.

Much pain and suffering will be avoided if you remember the above next time someone asks you, "Do you want a lift?"

J. W. Hallam, Safety Officer

News In Brief

Goldacre Award

Dr. J. Giovanelli of the Division of Food Preservation's Plant Physiology Unit has become the first recipient of the Peter Goldacre Award of the Australian Plant Physiology Society.

The award is for outstanding achievements in plant physiology by persons under 35 years of age. It commemorates the late Dr. P. L. Goldacre, who was a member of the Division of Plant Industry from 1947 until his untimely death in 1960 at the age of 34 years.

Doctorate

Mr. M. J. Ridge of the Division of Building Research has been awarded the degree of Doctor of Science by the University of Melbourne.

Chairman

Mr. W. T. Cooper of the Division of Coal Research has been elected Chairman of the Australian Membership of the Institute of Fuel for 1965-66.

Commission Member

Mr. I. Brown of the Division of Physical Chemistry has been elected to the Commission on Data and Standards of the International Union of Pure and Applied Chemistry.

In the Money

One out of every three people employed by CSIRO in New South Wales is now a member of the Laboratories Credit Union Co-operative according to the Union's latest annual report.

During the last financial year, £37,581 was received from depositors, increasing total deposits by members to a figure of £109,703. Over the same period a total of 276 loans were granted, representing an amount of £72,772.

Since 1955 the Credit Union has granted 2,000 loans, the total value being £311,261.

All CSIRO staff located in New South Wales are eligible for membership of the Credit Union. Enquiries should be directed to the Secretary, Mrs. J. H. Ryan, at the Sydney Regional Administrative Office, Grace Bros. Building, Broadway, N.S.W.

Washington Post

Mr. C. S. Elliot will be retiring from CSIRO shortly and will complete his term as Scientific Attache and head of the Scientific Liaison Office in Washington on November 26th.

Mr. J. E. Cummins will be Scientific Attache for the six months following Mr. Elliot's retirement.

Concrete Facts

"Concrete Technology and Practice", a new handbook for civil engineers, architects, supervisors, concrete practitioners, manufacturers, and students, has just been published simultaneously in Sydney, Melbourne, London, New York, Amsterdam and Tokyo.

Written by **Mr. W. H. Taylor** of the Division of Building Research, it is a right up-to-date, comprehensive technical handbook on all aspects of concrete work.

Some of the important subject fields covered by the book are:

- Properties of cements and aggregates; design of mixes; handling, placing, curing and finishing.
- Lightweight precast, prestressed and refractory concretes.
- Standard Specifications and test requirements.
- Fundamentals and processes of construction and fabrication of concrete structures and products.
- Concrete masonry, reinforcement, formwork and plastics.
- New developments, systems, procedures, products.

With more than 600 pages of text, with a complete table of contents and fully indexed, this classic work contains 32 pages of photographs, and more than 100 line diagrams, and 100 tables.

It is admirably produced, with a clear, readable type most attractively presented. The cost is £5.

Small Change

The Division of Land Research and Regional Survey has had its name changed to the Division of Land Research.

Below. The Secretary of the Credit Union, Mrs. J. Ryan, at work in the Union Office.

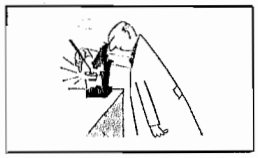
A number of CSIRO officers took part in the Australian Arid-Zone Research Conference at Alice Springs last month. The Conference was concerned with the ways in which plants, animals and humans adapt themselves to arid environments and with utilization of water resources, range management, and animal production in the arid zone. Our picture above shows (from left to right): Mr. A. C. Doery (Agricultural Liaison Unit), Miss Helen Newton Turner (Animal Genetics), Dr. R. Slatyer (Land Research), Mr. R. D. Croll (Agricultural Liaison Unit), and Dr. I. W. McDonald (Chief, Animal Physiology). Dr. Slatyer was Chairman, Mr. Croll a member, and Mr. Doery Secretary of the Conference Organizing Committee.

U.N. Assignment

The Secretary, Mr. G. B. Gresford, left last month for overseas where he will act as a consultant to the United Nation Advisory Committee on the Application of Science and Technology to Development.

Mr. Gresford will be away for three months. He will visit the U.N. Headquarters in New York, UNESCO in Paris, the Food and Agriculture Organization in Rome, and the International Atomic Energy Agency in Vienna.

In Geneva he will have discussions with the World Health Organization and other specialized agencies of the U.N. before attending the fourth session of the Advisory Committee which will be held there in mid-November.



The Advisory Committee was established by the Secretary General of the U.N. to follow up the work of the 1963 United Nations Conference on the application of science and technology to development.

The Advisory Committee has recommended a carefully-planned campaign by science upon some of the basic problems of developing countries, such as exploration and utilization of natural resources, provision of adequate food supplies and better housing and urban planning.

Exchange Scheme

A senior officer of the Japanese Science and Technology Agency has an 18-year-old daughter who would like to spend a few months with an Australian family.

He is hoping that an Australian scientist may have a daughter who would like to spend a few months in Tokyo, so that an exchange may be arranged.

If any member of the CSIRO staff would like to hear more about this proposition, please contact the Editor of "Coresearch".

Hidden Talent

Back in the War years the National Standards and Radiophysics Laboratories ran a revue at Sydney University.

Producers **Robert Coulson** and **Ernest Adderley** were pretty tough in their auditioning.

There was one girl on the clerical staff at Radiophysics who could sing a bit, but after auditioning her they decided she didn't quite make the grade.

Last August, however, they decided to send her the following telegram in Adelaide:

"Congratulations Miss Joan Sutherland. If we ever run another revue we will guarantee you a spot without further auditioning."

Small World

Dr. W. E. Savige of the Division of Protein Chemistry spent five months at the University of Perugia near Rome earlier this year in connection with his research on the yellowing of wool by sunlight.

While driving to Umbria one week-end, he was impressed by a particularly well kept vineyard and decided to stop and compliment the owner. He was immediately invited in and plied with food and litres of home-made wine when he happened to notice a familiar face on the wall.

It was a photograph of **Primo Mancini,** a laboratory assistant at the Division of Protein Chemistry for the last three years. Turned out to be his parents who owned the vineyard.

Paris Visit

Mr. C. S. Christian of the Executive visited Paris for a week last month to attend a meeting of the newly formed UNESCO Advisory Committee on Natural Resources Research. Mr. Christian was recently appointed a member of the Committee.

David Rivett Medal

The David Rivett Medal, a bronze medal instituted by the CSIRO Officers' Association in memory of the late Sir David Rivett, is awarded biennially, for outstanding research in CSIRO.

The first award, which was made in 1964, was for work in the biological sciences. The next award will be made in 1966 for work in the physical sciences.

All officers under the age of 40 at the time of the award are eligible to apply for the medal. The period covered by the research is the ten years preceding the award, and a substantial part of the work must have been carried out while the candidate was an officer of CSIRO.

Candidates for the award should submit their applications to the General Secretary of the Officers' Association, The Patch, Victoria, on or before the 31st December this year.

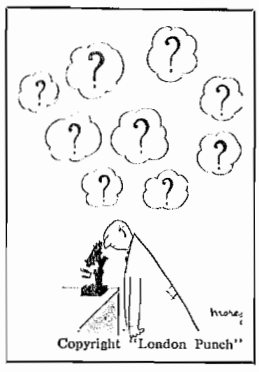
Submissions should include a statement of not more than one hundred words setting out in general terms the nature of the candidate's work, a list of the candidate's papers published or to be published in the ten years before the award, and copies of these papers.

If the examiner considers that none of the candidates in the field for which the award is offered are of sufficient merit, the award will be withheld and the next award offered for work in the alternative field.

Thought for the Month

"But they are to know, that in so large, and so various an Art as this of Experiments, there are many degrees of usefulness; some may serve for real, and plain benefit, without much delight; some for teaching without apparent profit; some for light now, and for use hereafter; some only for ornament, and curiosity. If they will persist in condemning all Experiments, except those which bring with them immediate gain, and a present harvest; they may as well cavil at the Providence of God, that he has not made all the seasons of the year, to be times of mowing, reaping and vintage."

Sprat, 1722



Screen News

The 314 Film Society will screen "Julius Caesar" at 8.00 p.m. on October 21st at Head Office.

The Forest Products Film Society will screen "The House I Live In" at 8.00 p.m. on October 26th at the Division of Forest Products.

New Appointees

Mr. W. A. Burridge has been appointed to the Computing Research Section in Sydney where he will be concerned with the programming of financial and administrative data. Since graduating B.Sc. in Applied Psychology from the University of New South Wales

Mr. W. A. BURRIDGE

in 1962 Mr. Burridge has been a guidance officer at the Sydney Technical College. From 1950 until 1962 Mr. Burridge held a number of clerical positions with the CSIRO Regional Administrative Office in Sydney and the Division of Food Preservation.

Dr. R. W. Downes has been appointed to the pasture plant breeding group of the Division of Plant Industry where he will be concerned with the development of improved strains of white clover and rye grass. Dr. Downes graduated B.Agr. Sc. with honours from the University of Queensland in 1958 and M.Agr.Sc. from the same University in 1960. He

Dr. R. W. DOWNES

obtained his Ph.D. from Cornell University in 1961 for a study of variation in height and maturity in Timothy grass. From 1961 to 1964 he worked with the Queensland Department of Primary Industries at Mareeba, on the development of improved pastures. For the last twelve months he has been seed production officer with the De Kalb-Shand Seed Co., Tamworth.

Dr. P. J. Hardy has been appointed to a research fellowship in plant biochemistry with the Horticultural Research Section. Dr. Hardy will study the chemical constituents of grapes, particularly those concerned with food value, flavour and taste. Dr. Hardy graduated B.Sc. with honours from the University of Nottingham in 1962 and obtained his Ph.D. from the same University last year for a study of sugar metabolism in potato tubers.

Dr. J. D. Esdaile has been appointed to the Division of Chemical Engineering where he will be concerned in developing techniques for the thermodynamic evaluation of ternary and higher order liquid metallic solutions. Dr. Esdaile graduated B.E. in Metallurgy and Chemical Engineering from the University of Adelaide in 1954 and Ph.D. from the same

Dr. J. D. ESDAILE

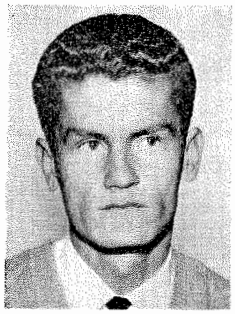
University in 1964 for work on the thermal chemistry of the lead-oxygen-sulphur system. He was employed as a metallurgist with Broken Hill South Ltd. during 1955 and as a chemical engineer with Australian Paper Manufacturers Ltd. in the following two years. Since 1958 Dr. Esdaile has been Lecturer in Extraction Metallurgy with the South Australian Institute of Technology.

Dr. J. A. Hemsley has been appointed to the Division of Animal Physiology where he will work on the nutrition of sheep with special reference to the physiology of undernutrition. Dr. Hemsley graduated B.Sc.Agr. with honours from

Dr. J. A. HEMSLEY

the University of Western Australia in 1961. Since then he has been studying for his Ph.D. at the University where his research has been on problems concerned with the utilization of poor quality roughage by sheep.

Dr. W. J. Peacock has been appointed to the Division of Plant Industry where he will work in the field of physiological and developmental genetics. Dr. Peacock graduated B.Sc. with honours from the University of Sydney in 1958 and obtained his Ph.D. from the same University in 1962 for his work on cytogenetics. For the last three years he has been working in the Department of Biology at the University of Oregon, first as a Post-Doctoral Fellow and then as Visiting Associate Professor. Earlier this year he spent several months as a research consultant in the Biology Division of the Oak Ridge National Laboratory.



Mr. D. A. LOVETT

Mr. D. A. Lovett has been appointed to the Division of Food Preservation where he will study heat and mass transfer and its application to the cooling, drying and heat processing of meat and meat products. Mr. Lovett graduated B.Sc last year from the University of Sydney.

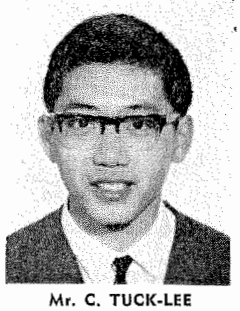
Dr. A. M. Taylor has been appointed to the Division of Applied Mineralogy where he will work on the mineralogy and geochemistry of silica and secondary silicate minerals. Dr. Taylor graduated B.Sc. with honours from the University of Otago, New Zealand,

Dr. A. M. TAYLOR

in 1956 and M.Sc. from the same University in 1958. He obtained his Ph.D. from Pennsylvania State University in 1962 for his work on crystal chemical relations in the Pzeolite group. For the last three years he has been a research chemist with the Silicate Research Group of the Union Carbide Corporation in the United States.

Dr. U. Perito has been appointed to a research fellowship in electronic engineering with the Division of Applied Physics where he will be concerned with the application of lasers to interferometry. Dr. Perito obtained his Doctorate of Physics from the University of Pavia in Italy in 1963. For the last two years he has been working on low temperature radiation damage at the S.O.R.I.N. Nuclear Centre at Saluggia, Italy.

Mr. C. Tuck-Lee has been appointed to the Division of Coal Research where he will be concerned with the applica-



Mr. C. TUCK-LEE

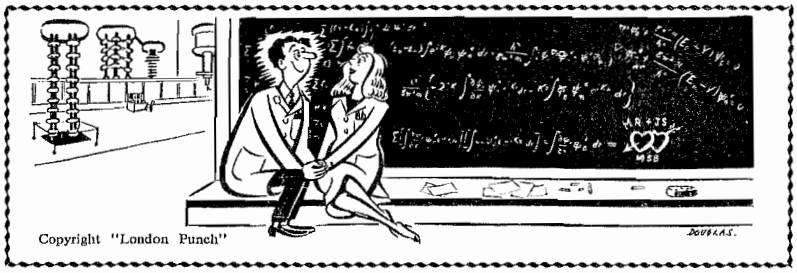
tion of electron microscopy, electron diffraction, and convential and hot stage light microscopy to the study of the inorganic constituents of coals. Mr. Tuck-Lee graduated B.Sc. last year from the University of Sydney.

RABBITOHS ROUT ALL COLOURS

Brilliant sunshine and a large crowd were in attendance for the annual clash of the CSIRO Rugby League giants, Canberra "All Colours" and Sydney "Rabbitohs" at the Turner Oval, Canberra, on Saturday, 28th August. The greater all-round strength of the Rabbitohs allowed them to retain the "Cox Shield" by winning 11 points to 6.

The Rabbitohs, shown above, are: Back row (from left to right)—M. Roarty, P. McFadyen, W. Lebon, G. Ayres, C. Poulson, K. Carr, J. McGrath, I. Farrell. Front row: M. Sinclair, K. Baker, D. Davies, P. Starr, M. Filan, J. Self.

The All Colours, below, are: Back Row (left to right)—A. Hewitt, J. Broadfoot, P. Hanish, B. Abbey, J. Layton, P. Moore, M. Chinnick, F. Bradley. Front row—A. Blewitt, L. Hall, F. McGuren, J. Feehan, A. Williams (Referee), G. Yapp.



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CORESEARCH

FOR CIRCULATION AMONG MEMBERS OF CSIRO STAFF — NUMBER 80, MELBOURNE, NOVEMBER 1965

How Decisions Are Made

At the second seminar organized by the Division of Plant Industry on policy making for science and technology, Dr. S. Encel presented a paper on "Pressures: how decisions are made".

Dr. Encel, who is Reader in Political Science at the School of General Studies of the Australian National University, is the author of a number of books and articles on political decision-making and political sociology.

He is particularly interested in the sociology of science and the impact of science on government policy.

Dr. Encel pointed out that policy decisions by governments influenced the outlook and behaviour of large numbers of people and groups, and were therefore subject to pressures and conflicting interests.

The eventual policy decision reflected or induced an equilibrium situation.

Those parts of policy that were directed towards science or on which science had an important impact were also subject to pressures if only for the simple reason that the appropriations governments now allowed science were significant proportions of government expenditure.

Dr. Encel said that the question of what kind of science should be supported was a policy question about which scientists differed. It was inevitable, therefore, that laymen should also differ.

Important as this sort of policy decision was, more "political" decisions had to be taken at many community levels.

These ranged from the amount of resources that could be devoted to science and technology in competition with all other national activities, to the many decisions that had to be taken in dividing up this investment between the various possibilities that lay between idle curiosity and the emergence of a new product or process.

As one passed from category to category in this continuum—from idle curiosity, through directed research and development to production—there was an immense scaling up in the costs of the decision that had to be made, and this reflected an increasing degree of risk and uncertainty in the investment.

There were also important policy matters involved in deciding whether some of the costlier stages in the process could be reduced by importing research results and technology or whether the research should be conducted at home.

We were now in the days of "big science" where enormous investments were required for such things as linear accelerators, and the scientists themselves were appealing to governments to adjudicate between alternative programmes and competing interests.

Two of the most important areas of policy conflict were: Firstly, where was the research to be done? What should be the role of the Universities? How and to what extent should industry be encouraged to undertake research? And secondly, who should control decision-making within scientific organizations? Should they be laymen or scientists?

There were many other areas which showed the possibility of conflicts of interest in science policy.

The important question was whether science policy decisions should be made in a different way.

Were the conventional methods of arriving at decisions through competing pressures suitable for making decisions about policy for science and about the contribution that science could make to either aspect of public policy?

Many countries had recognized the need for political and administrative innovations to cope with this matter.

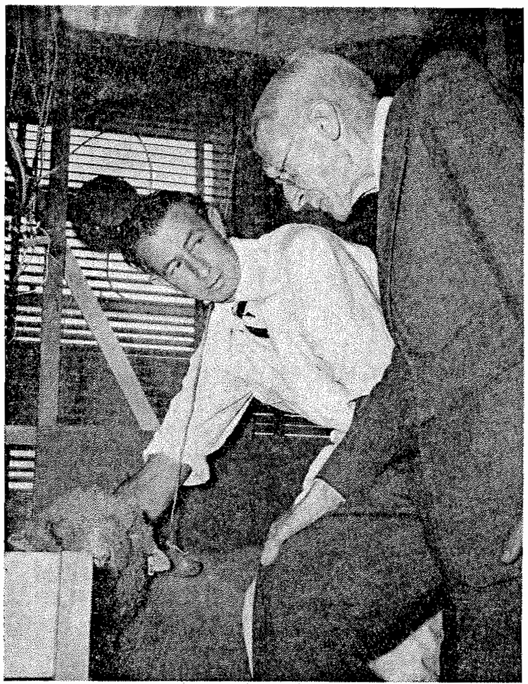
The Ministry of Technology in Britain had been created to see that there was adequate investment in those categories towards the production end of the continuum.

Research development corporations endeavoured to minimize the risks involved in development and a whole range of policy instruments had been adopted—taxation concessions, research contracts—to stimulate innovation within industry.

These matters were just as important in Australia as in other countries and we could ask whether the apparatus for taking decisions about science in Australia was adequate for the purpose.

DAVID RIVETT MEMORIAL LECTURE

Lord Adrian of Cambridge delivered the second David Rivett Memorial Lecture "Progress with the Human Nervous System" in the Canberra Theatre, on Thursday, 21st October.



While in Sydney Lord Adrian visited the Division of Animal Physiology. He is shown above with Mr. H. M. Radford of the Division discussing an experiment on the role of the central nervous system in controlling reproduction in sheep.

Lord Adrian is one of the greatest living British scientists.

As a young man, he intended to become a physician. However, he was influenced by Dr. Keith Lucas, his director of studies at Cambridge, to undertake research in physiology.

After qualifying in medicine and serving in the first World War, he returned to Cambridge to take up a research career.

He applied the techniques of electronics to the study of the nervous system. In his early days he worked on the isolated nerve, and was the first to record the electrical response in a single nerve fibre.

As opportunities arose through the development of new techniques, for which he was largely responsible, he studied the physiological reactions in the spinal cord, and finally those in the brain itself. His experimental results have been used to build up a concept of the underlying mechanisms of sensation.

Perhaps Lord Adrian's best known work has been on brain action potentials. He clamped electrodes to human heads and demonstrated the significance of the voltage rhythms he recorded. This work laid the foundation for the use of electro-encephalography as a diagnostic and research tool.

Lord Adrian has spent all of his professional life at Cambridge, where he has been Foulerton Research Fellow, Professor of Physiology, Master of Trinity College and Vice-Chancellor.

His outstanding services to science have been recognized in many ways. He has been Royal Medallist, Copley Medallist and President of the Royal Society. The Order of Merit was conferred on him in 1942 and a barony in 1955. He shared the Nobel Prize for physiology and medicine with Sir Charles Sherrington in 1932.

Lord Adrian arrived in Australia early last month and spent more than three weeks here before returning to Britain. Much of his time was taken up with visits to Australian laboratories including the Division of Animal Physiology.

Extracts from Lord Adrian's address may be found on page 2 of this issue.

VICTORIAN GOVERNOR AT MERBEIN

Sir Rohan Delacombe, the Governor of Victoria, and Lady Delacombe, visited the Merbein laboratories of the Horticultural Research Section last month to see something of the Section's work on vine breeding and selection, nematodes, orchard ecology, and the processing of dried sultanas. Our picture shows Mr. M. R. Sauer (left) explaining his work on nematodes to Sir Rohan and Lady Delacombe. The Officer-in-Charge of the Section, Dr. J. V. Possingham, is on the right.

Scientists on Television

Four distinguished scientists who have recently visited Australia will be interviewed on television this month by Dr. Peter Pockley of the A.B.C.

Dame Kathleen Lonsdale, F.R.S., Professor of Chemistry at University College, London, will discuss her pacifist and religious views in relation to science. She will also talk about women in science.

Mr. A. Rahman, Director (Survey and Planning) of C.S.I.R., India, will speak of science's role in combating hunger, disease, poverty and ignorance.

Professor J. Tuzo Wilson, Director of the Institute of Earth Sciences at the University of Toronto, will speak about future developments in geophysics and about science in Canada.

Dr. Frederick Seitz, President of the U.S. National Academy of Sciences, will discuss science and government in the United States, space projects, and the distribution of research effort.

All telecasts will be at 9.30 p.m., at fortnightly intervals.

Starting dates are 25th October (South Australia and Tasmania), 1st November (Queensland, except Rockhampton), 3rd November (New South Wales and Victoria), 8th November (Rockhampton) and 15th December (Western Australia).

PROGRESS IN THE HUMAN NERVOUS SYSTEM

Until twenty years ago the main obstacles to research on the brain were experimental difficulties, frustrations due to home-made apparatus and primitive surgery. Now when experiments fail to give an answer to our questions, it is not so much because of any technical difficulty, but because they have not been properly designed to do so; the frustration arises because we do not know what are the right questions to ask.

Since the first war we have learnt a great deal about the units of the nervous system — the neurones, a term which covers the nerve cells and the long fibres or short-branching processes attached to them.

The investigation of the activities of the neurone has now reached the molecular level. It is part of the new division of science where biophysics meets biochemistry and pharmacology.

However, when we leave the single neurones and study their organization in the body the problems we are investigating are of a quite different character.

We are then dealing with the brain and spinal cord, the central nervous system with its connections to sense organs and muscles.

It is a system of thousands of millions of neurones arranged to control the body so that it will move as a whole with a single purpose.

It has to plan and direct the particular sequence of operations which is best suited to the circumstances of the moment and the messages which it sends out to the muscles must form a co-ordinated pattern which is constantly changing as one movement succeeds another.

In 1885, Sherrington, then a young man at Cambridge, began his series of researches into reflex activity.

He studied particularly the simplest examples, where the brain has been destroyed but the spinal cord can still bring about an orderly movement in response to a stimulus, a movement involving both the contraction of some muscles and the relaxation of others.

One of his early investigations gave a clue to one factor which is of the greatest importance in producing such orderly movements.

The nerve trunk which runs to a muscle may contain many hundred nerve fibres, but a third to a half of them are afferent.

Their function is not to make the muscle contract, but to transmit information to the spinal cord about the contraction.

We are still working out the full implications of this elaborate signalling system, and it is only since the last war that we have realized just how elaborate and how important this feedback is.

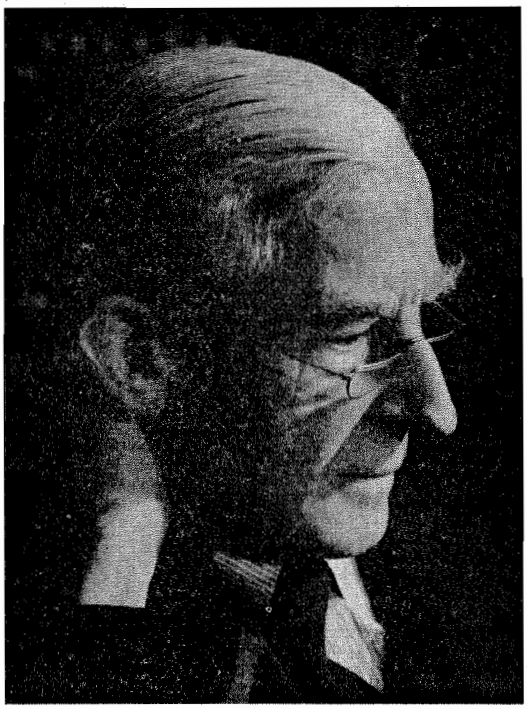
One of the simplest spinal reflexes studied by Sherrington was the flexion of the leg produced by pinching or pricking the foot.

It can be regarded as protective behaviour which would remove the foot from damage and in terms of the units concerned — sense organs, nerve fibres, cell networks and muscle fibres — the sequence of physical and chemical changes can be described, at least in outline.

But in the intact standing animal the behaviour set up by the prick would involve much more than the single limb.

The weight of the body would have to be shifted from four legs to three; in fact any limb movement would alter the running and jumping and righting itself if it is placed on its back.

The forebrain is not needed for these postural reflexes; an animal with the cerebral hemispheres destroyed but the brain stem intact has enough of the nervous system left to control the pattern of muscular contractions needed for standing, posture and almost every part of the muscular system would be involved in changing it.



LORD ADRIAN

This is far short of the full range and variety of intelligent behaviour, but it goes part of the way towards it.

It involves elaborately co-ordinated patterns of muscular activity controlled by information from a number of sense organs, some indicating the relation of the body to its environment and some the tensions in individual muscles and limbs.

Our understanding of how this behaviour is produced dates from over forty years ago.

At the Physiological Congress at Edinburgh in 1923, Magnus of Utrecht demonstrated the righting reactions which occur when a guinea pig is rolled over on its side.

The sequence is started by the change in the input from the otolite organs or from the body surface and after that the patterns, sensory and motor, are constantly shifting.

If one attempt at righting the body fails another is tried; it is only when the normal posture is re-established that the nervous system comes back into equilibrium.

While postural behaviour can be broken down into a number of simple reflexes, the analysis is to some extent misleading.

It is the synthesis of these elements into a co-ordinated pattern which is the essential function of the central nervous system, and in animals with larger brains this is more evident.

In their behaviour the immediate reflex elements are usually overshadowed by reactions which depend on past as well as on present events.

Their behaviour patterns are far more varied because they involve memory and learning from experience.

Since the Congress in 1923 the reflex postural side of behaviour has been worked out much more thoroughly by records from sense organs and nerve cells as well as from muscles, but we are still very far from taking the further step of being able to give an equally satisfactory analysis of the kind of behaviour has been learnt, ate with learning, and in man with thought.

Although the discovery of the structure of the genetic code suggests at least one possible way of storing memories it has been singularly difficult to find positive evidence of any material changes which have occurred in the brain when some new pattern of behaviour has been learnt, or some new memory stored up.

In spite of this, the study of the learning process has made considerable advances and can now rank as one of the most promising developments of the life sciences.

The Congress at Edinburgh in 1923 was made memorable not only by Magnus with his analysis of postural behavour, but by Pavlov and his analysis of the higher level of behaviour into unconditioned and conditioned reflexes.

Until 1927 when Pavlov's book appeared in English, little work was done on conditioned reflexes outside the U.S.S.R.

There was far more interest in the study of abnormal behaviour (human at least) by psychoanalytic techniques.

Since then Pavlov's theories have been better understood and more widely accepted and the technique of research on conditioning has been improved, particularly since the last war.

But this kind of analysis of high level behaviour has had to contend both with other kinds of analysis and with non-analytical ways of looking at it and it cannot be said that Pavlov's way has been accepted as the best.

There has, however, been a modification of the conditioned reflex explanation which has been highly successful, at any rate in its practical applications.

The modification dates originally from Bechterev, a contemporary of Pavlov's, who began the study of association reflexes at much the same time.

It is now known as 'operant conditioning' or 'instrumental conditioning' and its principles are embodied in some forms of teaching machine already in use in the U.S.A.

The important feature of operant conditioning is that an elaborate pattern of behaviour is built up by 'schedules of reinforcement'.

Food or some other reward is given whenever some particular random movement is made and so it soon comes to be made more often.

The food is then given only when the first movement is followed by the movement which is next in the schedule and more and more can be added by progressive reinforcement.

Skinner at Harvard is the chief exponent of the technique of reinforcement and in his hands it succeeds so well that it may take much less than an hour to train a pigeon in some complicated routine of behaviour.

In the classical or Pavlovian conditioning there is no waiting for a particular movement to occur.

Food is given to produce the unconditioned reflex of salivation and if a sensory stimulus, like the sound of a bell, is given at the same time there will soon be the conditioned response of salivation whenever the bell rings.

With classical conditioning the end result is usually a simple autonomic response, though a specific sensory pattern may have been conditioned to arouse it: with operant conditioning the end result may be an elaborate pattern of movement built up by reinforcing a series of random movements.

There is no reason to suppose that learnt behaviour in animals or in man is due exclusively to one type of conditioning, in fact Konorski has combined both methods in some of his animal training.

I spoke earlier about the way in which postural behaviour could be analysed into a succession of simple reflexes, reflexes of the straightforward mechanical kind studied by Sherrington and now at the cellular level by Eccles; and I said that although postural behaviour can be fairly elaborate we were still very far from being able to analyse intelligent, learnt behaviour on the same lines.

But I am not sure that I was right. Skinner has shown how learnt behaviour can be put together out of simple components using a reward to reinforce each item of the programme.

Synthesis is not quite the same as analysis and one cannot enter into the thoughts or feelings of the pigeon when it is earning its food, but it looks as though a good deal of high level behaviour is to be thought of as a sequence of actions none of which differs radically from those involved in the righting reflexes which preserve the normal posture of the body.

But operant conditioning may well be more important for its practical consequences than for what it tells us about the nervous system.

For it is responsible for some of the present development of teaching machines and of what is called programmed instruction.

This development will, I think, be something that will have great consequences for education — it may even rank with the introduction of computers as one of the great technical advances of our time.

Teaching machines are one of the practical consequences of research on the nervous system.

There are, of course, other consequences in the medical field, such as the new drugs for psychiatric conditions and new diagnostic and surgical methods.

I expect we shall soon be in a position to profit by better knowledge of the chemical control which may be exercised in the brain by specific molecules.

In fact I think that our behaviour and that of the higher mammals will soon come to be pictured as a succession of patterns: each constructed of simple units, reflexes unconditioned or conditioned with feedback arrangements at all levels, and each pattern forming an organized whole which dominates the scene for a time and then gives way to another evoked by environmental or internal change.

But I do not think that such a picture or indeed any picture of the human nervous system is ever likely to be completely satisfactory.

It is built to respond to so many external and internal, present and past events that we shall never be able either to trace cause and effect in detail or to reach agreement about general principles.

And I do not think we ought to be completely satisfied by any picture which lets us forget the conscious mind and think only of the muscular machine.

I believe that those who attempt to understand the human nervous system will never be wholly satisfied but will continue to find some reward in the new knowledge they gain.

I believe too that for most of us the reinforcement will be much stronger if the new knowledge can be put to some good use.

We have evolved remarkable biological systems which keep us standing upright and enable us to teach our children reading, writing and arithmetic without using any rotating parts or printed circuits.

We may be able now to get more uniform results from the machinery we can build, but most of us feel a loyalty to our species and would be secretly sorry to find our human skills entirely superseded by transsistorised circuitry.

News In Brief

Professorships

Dr. G. B. Sharman of the Division of Wildlife Research has been appointed to the Foundation Chair of Zoology at the University of New South Wales.

Dr. J. M. Swan of the Division of Organic Chemistry has been appointed to the Foundation Chair of Organic Chemistry at Monash University.

Both Dr. Sharman and Dr. Swan will take up their new appointments next January.

Associate Member

Mr. L. Lewis of the Industrial and Physical Sciences Branch at Head Office has been appointed Associate Member of the Executive. Mr. Lewis was formerly Executive Officer.

Mr. L. LEWIS

Doctorates

Mr. I. Brown of the Division of Physical Chemistry has been awarded the degree of Doctor of Science by the University of Adelaide for his work on the thermodynamic properties of non-ideal liquid mixtures.

Mr. S. F. Smerd of the Division of Radiophysics has been awarded the degree of Doctor of Science by the University of Liverpool for his work on solar radio astronomy.

Mr. E. F. Bradley of the Division of Plant Industry has been awarded the degree of Doctor of Philosophy by the Australian National University for his studies of wind drag on the earth.

Highland Flingers

More than 340 people attended the first CSIRO Ball in Sydney last month. One of the highlights of the evening was the performance of the Scottish National Dancers.

Shown below from left to right are Mrs. and Mr. G. Stott, Mrs. and Mr. J. Neill, Mrs. and Mr. C. Quinnell and Mrs. and Mr. J. Young. Mr. Stott and Mr. Quinnell are members of the Division of Textile Physics.

President

Dr. J. Hosking of the Division of Building Research has been elected President of the Australian Ceramic Society.

For Overseas

The temporary appointment of Mr. J. E. Cummins to the Scientific Liaison Office in Washington was announced in Coresearch last month. Mr. Cummins, who is Treasurer and Executive Officer of the Ian Clunies Ross Memorial Foundation, will leave for the United States shortly.

While there he will maintain his interest in the Foundation and will follow up a number of matters on its behalf. The office of the Foundation will continue to operate in his absence and enquiries and correspondence should still be forwarded to the Executive Officer of the Foundation at 314 Albert Street, East Melbourne.

New Name

The name of the Division of Biochemistry and General Nutrition has been changed to the Division of Nutritional Biochemistry.

Transfer

Dr. G. W. Arnold of the Division of Plant Industry has transferred from Canberra to Perth where he will take charge of the Division's activities in Western Australia.

Screen News

The 314 Film Society will screen "Bicycle Thieves" at 8 p.m. on November 18th at Head Office.

The Food Preservation Film Society will screen Cocteau's "La Belle et la Bete" at 7.30 p.m. on November 23rd at the Division of Food Preservation, North Ryde.

The Forest Products Film Society will screen "The Birds" at 8 p.m. on November 24th at the Division of Forest Products, Melbourne.

Decimal Currency

On 14th February next year —"C day" — the new dollars and cents will appear in circulation alongside the familiar £.s.d. All of CSIRO's financial transactions will then be conducted in decimal currency.

For the past twelve months a committee has been looking at the problems involved in the change-over.

Arrangements have been completed for the replacement or conversion of accounting machines, all accounting forms and procedures have been reviewed, and the printing of decimal currency forms is under way.

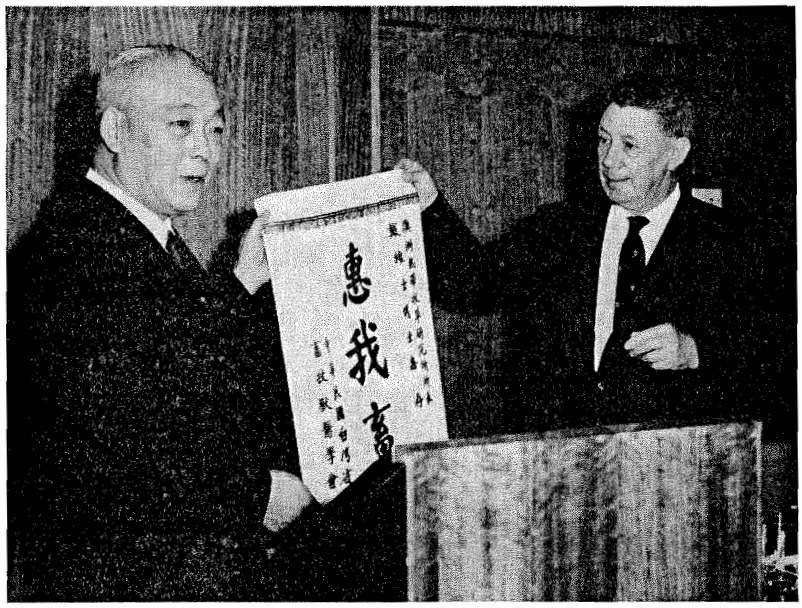
Plans for staff training have also been drawn up. Training will be spread over the 2½ months before C-day and will be directed mainly at staff in the salaries, finance and expenditure, and purchasing groups.

The conversion of salaries and accounting records from £.s.d. to decimal currency is under way to make the changeover as smooth as possible.

"I've nothing against you personally — I just don't like that damn geneticist taking me for granted."

Copyright "London Punch".

A one-day decimal currency seminar will be held at each of the three regional offices early in December. Representatives from each Division and Section in the particular region will be invited to take part.



Last September members of the Economic Goodwill Mission of the Republic of China to the Commonwealth of Australia visited the Division of Tropical Pastures at the Cunningham Laboratory, Brisbane. They presented banners to the Chief of the Division, Dr. J. G. Davies, and to Dr. R. Milford and Mr. C. T. Gates, who had visited Taiwan in recent years and advised on pasture problems there. Our picture shows the leader of the delegation, Mr. Wilfred Ling, Deputy Director of the Central Trust of China, presenting one of the banners to Dr. Davies.

LOAN MAXIMUM RAISED

The CSIRO Co-operative Credit Society has raised its loan maximum from £2,000 to £3,000. The decision to do this was taken at the Society's Eighth Annual Meeting at Head Office on 20th October.

Mr. W. Ives, Chairman of Directors, said that the new £3,000 loans would be mainly for buying homes.

Many of the Organization's officers had been experiencing a good deal of difficulty in obtaining suitable finance for housing, he said, and the Directors of the Society were therefore glad that the Society was now in a position to help further.

Reporting another successful year of operation, Mr. Ives mentioned that loans totalling more than three-quarters of a million pounds had been made to Members of the Society since it began in 1957.

Nearly one-quarter of a million pounds had been lent in the last financial year alone.

At least 60% of the loans were to help officers buy homes.

Membership of the Society had increased steadily throughout the year and was now at a record level of 1530.

Investment in the Society had also continued to increase and as at the 31st August its gross assets amounted to £387,836, 46% higher than the year before.

Because of the rapid growth in the Society's activities a decision was taken at the meeting to increase the number of Directors from five to seven.

Mr. Ives said that the whole purpose of the Society was to provide a safe and profitable investment for those with money to lend and a source of funds for those who found it difficult to get financial assistance elsewhere except at a very high price.

The Society's rate of interest on loans was 4½% flat compared with a current rate on second mortgages of about 10% flat

SAFETY NOTES

In the last twelve months or so there has been at least one case of acute benzene poisoning and one of mercury poisoning both involving qualified professional staff.

Had normal precautions been taken, neither of these serious poisonings would have happened.

All staff should look objectively at their current experimental procedures to eliminate any possibility of poisoning either themselves or some unsuspecting assistant.

The screening of the film "Toxic Solvents" may serve as a reminder to staff of the hazards from their materials.

Remember, with benzene, if you can smell it, it's dangerous; with mercury, no warning is given until symptoms of poisoning appear.

Be aware of the dangers of the materials you are handling, and make sure your assistants are aware of them, too.

Materials which have toxic vapours should only be handled in an efficient fume cupboard. If this is not practicable, adequate ventilation or respiratory protection must be provided.

J. W. Hallam, Safety Officer.

Visitors

Professor J. A. Basinger of the Department of Atmospheric Sciences at the University of Washington is spending four and a half months with the Division of Meteorological Physics. Professor Basinger will work with members of the Division on problems of the surface layers of the atmosphere particularly in relation to evaporation and the transfer of turbulence.

Dr. Daphne Osborne of the Department of Agriculture, Oxford University, is spending four months with the Division of Plant Industry in Canberra. Dr. Osborne is well known for her work on plant growth substances, particularly their interaction in the control of leaf abscission and fruit setting.

New Appointees

Mrs. J. M. Beauchamp has been appointed to the Division of Building Research where she will carry out research on the conduct and management of building operations. After graduating B.Sc. from the University of New Zealand in 1960,

Mrs. J. M. BEAUCHAMP

Mrs. Beauchamp spent two years at the Institute of Nuclear Sciences of the New Zealand D.S.I.R. Since 1963 she has been working in the Physics Department of the University of Melbourne where she recently obtained her M.Sc.

Mr R. M. Jones has been appointed to the Division of Tropical Pastures where he will work on the development of improved pastures for dairy cattle in south east Queensland. Since graduating B. Sc. Agr. with honours from the University of Sydney in 1959, Mr Jones has worked with the Soil Conservation Services of New South Wales, mainly on scald and claypan reclamation. In 1961 he was awarded a Rotary Foundation Fellowship and spent twelve months at the University of Witwatersrand, South Africa, where he obtained his M.Sc.

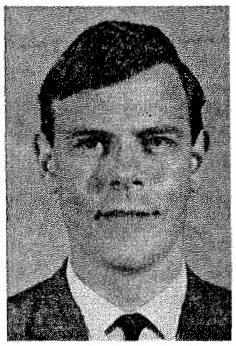
Dr G. M. Bhatnagar has been appointed to a Post-Doctoral Fellowship with the Division of Protein Chemistry where he will carry out research on the resistance of wool proteins to enzyme attack in relation to the setting of wool. Dr. Bhatnagar graduated B.Sc. in 1955, M.Sc. in 1957 and Ph.D. in 1961 all from the University of Luck-

Dr. G. M. BHATNAGAR

now, India. In 1960 and 1961 he was a senior research fellow at the Aligarh University and in the following two years he carried out research at the National Chemical Laboratory, India. Since 1963 he has been working on denaturation of chymotrypsins at the Institute of Medical Research of the Chicago Medical School.

Professor S. N. Fazekas has been appointed to the Division of Animal Genetics where he will direct the strategy of the Division's investigations into developmental genetics at the molecular level. Professor Fazekas graduated M.D. with honours from the Medical School of Budapest University in 1943. He became Assistant Professor in the University's Department of Histology and Embryology in 1944 and obtained his Sc.M. in 1946. In 1947 he came to Australia and spent the next five years working at the Walter and Eliza Hall Institute. He was appointed Senior Research Fellow in the Department of Microbiology at the Australian National University in 1952, Reader in 1958, and Professor of Virology in 1960. The same year Professor Fazekas was elected a Fellow of the Australian Academy of Science and in 1963 was awarded the Pasteur Medal by the French Immunology Society for his work on the immunology of viruses.

Mr. P. A. Grant has been appointed to the Industrial and Physical Sciences Branch at Head Office where he will provide additional assistance for Divisions on patenting matters. After obtaining his Fellowship Diploma in Electrical Engineering from the Royal Melbourne Institute of Technology in 1956, Mr. Grant worked with a firm



Mr. P. A. GRANT

of patent attorneys. He qualified as a patent attorney in 1960 and spent two years in California with the F.M.C. Corporation and a year in England in private practice. For the last two years he has been internal patent attorney with Philips Industries in Sydney.

Mr. N. E. G. Gilbert has been appointed to the Division of Mathematical Statistics. He will be located at the Division of Entomology in Canberra and will work with the Division's population ecologists on basic studies of the determination of insect abundance and on the development of ecological principles and procedures to improve present methods of control. Mr. Gilbert graduated

Mr. N. E. G. GILBERT

B.A. from the University of Cambridge in 1951 and obtained his Diploma of Mathematical Statistics from the same University in 1952. From 1952 to 1954 he was with the Statistics Department at Rothamsted Experimental Station and from 1955 to 1961 with the John Innes Institute. After two years at the University of Edinburgh he obtained his Diploma in Biophysics in 1962 and returned to the John Innes Institute.

GRIFFITH MEN IN HOCKEY TRIUMPH

This year the female staff of the Irrigation Research Laboratory at Griffith entered a team in the Griffith and district hockey competition. The team was beaten only in their first match and then in the final. Not to be outdone the male staff formed a team and issued a challenge to the girls. After a rough and tumble seventy minutes the men emerged the victors, possibly because of their rather loose interpretation of the rules.

The successful men's team shown above, are: Back row (from left to right) — R. Trewin (Umpire), E. R. Hoare, P. Cary, J. Loveday, G. Chapman, J. Bleijie. Front row — A. Gunn, E. T. Linacre, L. Bisa, M. Flynn, P. Hughes.

The girls' team, shown below, are: Back row (from left to right) — Judy Barrett, Jeanette Leonard, June McMahon, Suzanne Muirhead, Rosemary Heath, Kaylene Sell. Front row — Lyn Beaumont, Lynette Trennery, Robyn Taylor, Rhonda Bartholomew (captain), Juanita Batros.

Mr. P. D. Praetz has been appointed to the Division of Mathematical Statistics where he will undertake statistical research and assist officers of Adelaide Divisions in the design and analysis of experi-

Mr. P. D. PRAETZ

ments. Mr. Praetz graduated B.A. with honours from the University of Melbourne in 1961 and M.A. from the same University in 1962. Since then he has worked with a firm of consulting actuaries and statisticians.

Dr. J. T. Neilson has been appointed to the Division of Animal Health where he will work on the physiology and the *in vitro* culture of internal parasites of sheep. Dr. Neilson graduated B.Sc. in agricultural chemistry with honours from the University of Glasgow in 1961. He recently obtained his Ph.D. from the same University for his work on biochemical and immunological aspects of helminth disease.

Dr. J. B. Whiteoak has been appointed to the Division of Radiophysics where he will undertake research in solar, cosmic and hydrogen-line radio-astronomy. After graduating B.Sc. from the University of Melbourne in 1957, Dr. Whiteoak worked at the Mt. Stromlo Observatory. He obtained his Ph.D. from the Australian National University in 1961 and in 1962 held a temporary research position with the Division of Radiophysics. In the last three years he has worked at the Mt. Wilson and Palomar Observatory and at the Department of Radioastronomy of the California Institute of Technology.

Dr. J. B. Russell has been appointed to a Post Doctoral Fellowship with the Division of Organic Chemistry where he will study biologically-active plant metabolites. Dr. Russell graduated B.Sc. with honours from the University of Canterbury, New Zealand in 1960 and

Dr. G. B. RUSSELL

Ph.D. from the same University in 1963. For the last two years he has been with the Plant Chemistry Division of the New Zealand D.S.I.R.

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CORESEARCH

FOR CIRCULATION AMONG MEMBERS OF CSIRO STAFF — NUMBER 81, MELBOURNE, DECEMBER 1965

New Tactics In War On Insects

Although the use of insecticides had a number of disadvantages, it was difficult to envisage the time when it would no longer be sensible to use them, Dr. D. F. Waterhouse told the Advisory Council when it met in Melbourne last month.

Dr. Waterhouse, Chief of the Division of Entomology, was speaking to the Council on new perspectives in insect control.

There was no doubt, he said, that insect control was far better today than it had ever been and that much of the striking improvement in the last twenty-five years had been due directly to the use of insecticides.

Nevertheless, he cautioned, insecticides had their disadvantages.

- They seldom brought about a permanent lowering of pest numbers and had to be applied regularly.
- Many insects were resistant to them.
- They provided a series of hazards to non-target organisms such as man and wildlife.

It was possible that new, more highly specific materials which were more toxic to pests and less toxic to non-target organisms might be developed.

However, another approach which was proving increasingly valuable was to use methods that obviated the need for insecticides or which kept their use to a minimum.

Dr. Waterhouse described a number of alternative methods of insect control including the use of resistant varieties of plants and animals, biological control, and the adoption of cultural practices such as rotational destocking of pastures to control cattle tick.

He also mentioned the successful eradication of the screw-worm fly from Curacao and Florida by the release of enormous numbers of male flies which had been sterilized by ionizing radiation.

The introduced sterile males outnumbered the naturally occurring normal males by between ten and twenty to one so that most of the matings which took place resulted in no progeny.

One fascinating prospect which was being looked at by the Division of Entomology was the possibility of introducing harmful genes into an insect population.

This could be one way of significantly lowering populations of the sheep blowfly and the bush fly, said Dr. Waterhouse.

The possibility of using insect hormones still awaited exploitation, Dr. Waterhouse continued, but meanwhile the immediate prospects were very good indeed for using pheromones.

Pheromones were chemical substances produced by insects and released into the open to transmit messages between individuals of the same species.

The virgin female gipsy moth, for example, produced about one hundred millionth of a gramme of sex attractant.

This was enough to activate perhaps one hundred thousand million males.

In the United States a campaign known as "Operation Confusion" was waged against the gipsy moth.

Millions of tiny cubes, each impregnated with hundreds of times the amount of female sex attractant contained in a single female, were dropped from aircraft.

With such an overwhelming ratio of these pseudo-females to true females, it was estimated that the chances would be very high that the flightless females would leave no progeny because they would not be found by the utterly confused males.

Dr. Waterhouse said that the type of control he had been speaking about was best described as pest management — the intelligent manipulation of nature for man's lasting benefit.

He concluded by saying that the leads for pest management were most likely to come from Government-financed research institutes and universities, because there was little profit incentive to attract industry.

Furthermore, developments were likely to occur more slowly than in insecticide work since a far more thorough study of each pest and its biological and physical environment was necessary.

Dr. M. Day, Assistant Chief of the Division of Entomology, told the Advisory Council that insects were often extraordinarily difficult to control because they were among the toughest creatures on earth.

Man, for example, was killed by exposure to 400 roentgen units of radiation.

Six to eight thousand units were required just to sterilize an insect and this in no way impaired its longevity or behaviour.

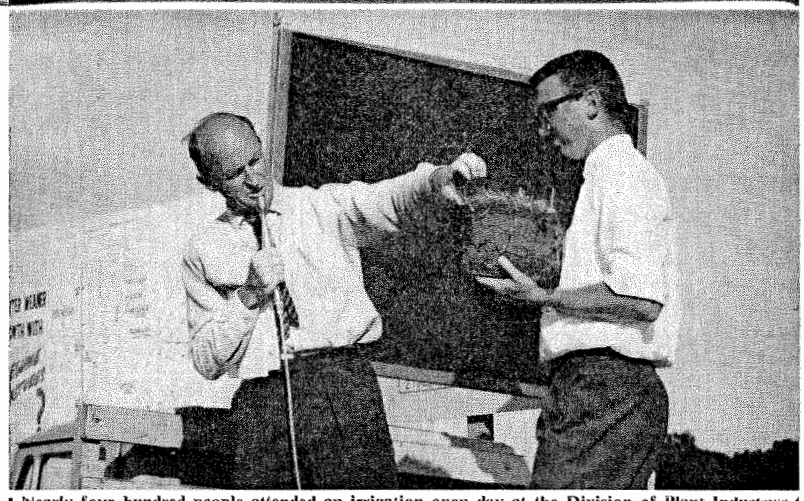
An astronaut in a "g" suit was exposed to about 6 g at blast-off. He "blacked-out" at less than 10 g.

An insect, on the other hand, could breed continuously and normally at 15 g and could withstand 6000 g without deleterious effects

One desiccated larval insect had even been taken to the temperature of liquid helium (—270°C) and later underwent normal development when returned to room temperature.

Yet in spite of their toughness, said Dr. Day, each insect had its own little Achilles heel.

FIELD DAY AT DENILIQUIN



Nearly four hundred people attended an irrigation open day at the Division of Plant Industry's Fawkner Memorial Field Station at Deniliquin on Wednesday, 27th October. The visitors saw the results of recent work at the Station which has shown that gypsum can have a much wider use than was formerly thought possible, particularly on light soils where water penetration is a problem. They also saw some of the research being carried out on weaner growth, lucerne improvement, wheat and wool production under irrigation, and weed control. Our picture shows Mr. C. Kleinig (left) and Mr. J. Noble during a demonstration of the response to gypsum on light textured soils.

Tackling the Regrowth Problem

Dr. R. M. Moore, an Assistant Chief of the Division of Plant Industry, will transfer shortly to the Division of Tropical Pastures where he will lead research on the scrub regrowth problem in Queensland.

Some 80 million acres of cleared country in the pastoral region of southern Queensland

Dr. R. M. MOORE

are affected by the regrowth of the native tree and shrub species of the original forest and woodland.

As a result, stock-carrying capacities have been reduced.

Large areas of northern New South Wales are also affected and the Division of Plant Industry will shortly commence investigating the problem in the north-west of the State.

Dr. Moore will study the regeneration of trees and shrubs from seed and regrowth from stems and roots.

These ecological studies may lead to the development of management practices which will solve the regrowth problem.

Earlier this year, Dr. Moore was elected a Fellow of the Australian Institute of Agricultural Science in recognition of his outstanding contributions to research on the ecology of weeds and pastures.

He has a particular interest in the effects of the grazing animal on native vegetation.

EXECUTIVE APPOINTMENT

Dr. K. L. Sutherland, D.Sc., Ph.D., F.A.A., Director of Research for the Colonial Sugar Refining Company Limited, has been appointed a part-time Member of the Executive.

He fills the vacancy created by the resignation of Lord Casey on his appointment as Governor-General.

Dr. Sutherland graduated B.Sc. from the University of Melbourne in 1937.

Dr. K. L. SUTHERLAND

He received his M.Sc. from the same University in 1941 for his research on the froth flotation of minerals.

He joined the CSIRO Division of Industrial Chemistry in 1940 and continued his work on flotation, concentrating particularly on the kinetics of the process.

In 1947 he was awarded the Davy-Faraday Fellowship of the Royal Institution and worked in London for two years.

He was subsequently awarded the degrees of D.Sc. by the University of Melbourne and Ph.D. by the University of London.

In 1950 he returned to the Division of Industrial Chemistry as leader of its Physical Chemistry Section.

This Section became the Division of Physical Chemistry in 1958, and Dr. Sutherland was appointed Chief of the Division.

In 1959 he resigned from CSIRO to take up his present position with C.S.R.

Dr. Sutherland was awarded the Grimwade Prize (1943), the Rennie Medal (1943), the Syme Prize (1948), and the H. G. Smith Memorial Medal (1957).

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

TWO SHARE SYME PRIZE

The University of Melbourne has awarded the David Syme Research Prize for 1965 jointly to Dr. J. M. Swan of the Division of Organic Chemistry and Mr. L. R. Clark of the Division of Entomology.

The award is made annually for distinguished scientific research carried out in Australia.

Dr. Swan received the award for his research in the general field of organic synthesis with a view to finding compounds of agricultural and pharmaceutical value.

Dr. Swan will leave CSIRO next month to occupy the Foundation Chair of Organic Chemistry at Monash University.

Mr. Clark shared the Syme Research Prize for his work on the factors which determine the abundance of lerp insects (Psyllids) on the eucalypts of the New South Wales southern tablelands.

The results of Mr. Clark's research are of theoretical importance in the field of population dynamics, the branch of biology which deals with the natural regulation of animal numbers.

They suggest that none of the theories put forward to explain the limitation of insect numbers provides a satisfactory general explanation.

But Mr. Clark's investigation is expected to make it possible to combine the principal elements of these theories into a flexible working hypothesis of the natural regulation of insect numbers.

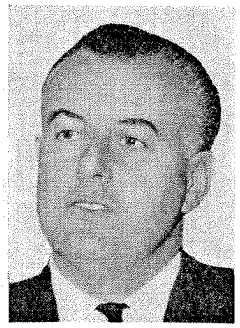
HOUSE OF REPRESENTATIVES DEBATES CSIRO ESTIMATES

The Deputy Leader of the Opposition, Mr. E. G. Whitlam, told the House of Representatives last October that our ability to maintain our place and our standards within the increasingly competitive world of the future depended in no small measure on the quantity and quality of our basic and applied scientific research and technology today.

Mr. Whitlam was speaking during the debate on the 1965-66 estimates of CSIRO and the Department of National Development.

The Australian Labor Party was the only party, he said, which had proclaimed a science policy.

The next Labor Government would see to it that the voice of science and technology was heard by Cabinet through a Minister for Science assisted by an Australian Science Council composed largely of scientists and technologists.



Mr. E. G. WHITLAM

Labor believed that scientists and technologists had a vital role to play in Australia's future development.

Furthermore, the next Labor Government would give Parliament a real voice in the implementation of policy through a standing committee on science, provided with a suitably staffed secretariat.

Mr. Whitlam then went on to speak of the relations between CSIRO and the Universities.

Much would be gained, he said, by an interchange of personnel between the CSIRO or Government scientific departments and the universities.

However, superannuation was not transferable and the interchange was therefore blocked.

Referring to the possibility of CSIRO getting so large that it might become bureaucratised, Mr. Whitlam said that the Labor Party intended to ask the proposed Australian Science Council to look into the matter and to examine that whole of the Government's activity in civil science to see if it could be organized more effectively.

Mr. Whitlam felt that Government scientific and civil engineering staffs should, as far as possible, be removed from the aegis of the Public Service Board which inevitably thought in bureaucratic terms, and remodelled along the lines of CSIRO.

After stressing the importance of providing scientists with adequate laboratory accommodation and the desirability of CSIRO having a triennial budget, Mr. Whitlam criticised the situation whereby research programmes started with industry funds had to be approved by outside bodies.

This added to the administrative duties of research scientists while limiting their freedom of action, he said.

The arrangement was based on the curious assumption that the best people to tell scientists how and where to conduct their research were laymen.

We had the ludicrous contrast of the Robertson Committee of 10 prominent academics administering £1 million of Federal money for research while the Australian Wool Board, which contained no scientists and was advised by committees on which there were few scientists, administered £2,600,000 of wool research money.

Significantly, it was the Wool Board that had taken it upon itself to insist that the CSIRO should do no work on blends of wool with synthetic fibres, despite scientific opinion that this was a field which held promise for future wool utilization.

The only people competent to design research programmes were the scientists themselves and if they could be trusted to spend wisely the £13¼ million provided by the Treasury they could also be expected to use wisely the £4¼ million from other sources without having to justify their progress in detail to lay bodies.

One way to get more value from money spent on research was to give the CSIRO Executive a freer hand with the quite large amounts of taxpayers' money that were administered by such bodies as the Wool Board.

Mr. Whitlam concluded by referring to some of the problems associated with development.

Mr. C. W. Bridges-Maxwell (Liberal Party — N.S.W.) said that Mr. Whitlam had spoken as if Australia was the only country that did not have a science policy.

Mr. C. W. BRIDGES-MAXWELL

However, after reading the report of a conference held in Vienna earlier this year on "Science and Parliament", he considered that no country had an effective science policy.

He went on to say that while CSIRO's annual report and the explanatory notes on the estimates were interesting documents, they did not answer such major questions as were we expending enough on research?

Were we spending too much or were we spending too little?

What were the major problems that CSIRO was trying to solve?

Mr. Bridges-Maxwell said that Parliament needed information on what was happening in other research organizations in Australia if it was to make a proper evaluation of the work that was being done and needed to be done in research.

It was disturbing, he said, that there should be such a wide disparity between the information upon which Cabinet based its decisions and the information available to private members upon which to ratify, amend or discuss those decisions.

This lack of information and inequality of knowledge was not peculiar to Australia but attempts were being made in some overseas countries at least to remedy the situation.

The House of Commons had an unofficial committee called the Parliamentary and Scientific Committee.

In 1962 the Committee comprised 130 members of the House of Commons, drawn almost equally from both sides, 63 peers and representatives of 127 scientific organizations.

The Committee was self-supporting and the organizations represented contributed a certain amount, depending on what they wanted from the Committee in terms of information.

Members of Parliament payed a nominal 10s. membership; this allowed the operation of a small secretariat.

There was a two way flow of information. Reports were published. Copies of debates and questions in the House were sent to the member organizations.

SENATE DEBATE

The CSIRO estimates for 1965-66 were debated in the Senate on 11th November, but due to the large amount of other business before the Senate the debate lasted a little over ten minutes.

The Minister-in-Charge of CSIRO, Senator Gorton, answered questions from Senators Mulvihill, Bull and Wood.

Mr. Bridges-Maxwell suggested that Parliament set up a similar committee with some minor adaptations to meet Australian conditions.

Branches could possibly be formed within the State Parliaments so that there would be an exchange of knowledge between the Parliaments.

If this were done it might be feasible to hold an annual or biennial conference at which non partisan matters of common interest could be discussed.

Mr. Bridges-Maxwell then went on to say that science was becoming increasingly important not only in the community at large but in virtually every matter that come before Parliament.

He quoted a remark by David Sarnoff, President of the Radio Corporation of America, "Science is much too serious a matter to be left to scientists".

Sarnoff may have been right, he said, because of the involvement of government with science, but today science was weaving its web into every facet of our lives — into government and into industry.

This was as it should be if we were to continue our growth as a nation and maintain our standard of living, but members of Parliament needed to understand to a far greater extent not only science but also the problems of scientists.

The Government would have to depend to a greater extent on its expert advisers, and private members would also have to draw on expert knowledge.

Some major decisions that had changed the course of world events had resulted from scientific knowledge.

If Roosevelt had not acted on Einstein's letter on atomic energy, he said, the history of the last three decades would be completely different.

Unless parliamentarians understood science and came to terms with scientists, some day somebody might say "Politics is much too serious a matter to be left to politicians".

If that happened our democracy would fall.

Mr. A. A. Armstrong (Country Party — N.S.W.) said that in his work in primary industry he had become acquainted with much of the scientific research of CSIRO, and that he had yet to find one scientist in the Organization who had not tried to be practical and to get results that would be of use to primary industry.

Although expenditure on scientific research in Australia had been compared with expenditure by various great powers, it had to be remembered that the greater part of expenditure by other countries was devoted to rocketry and weapons research.

Australia did not have the resources to engage in this large scale and costly research.

A large amount was also spent overseas on developing new products and improving productive techniques.

Only large concerns could afford the intense research effort and large expenditure involved in this.

The achievements of the scientist were of no value unless the people who were going to use them were thoroughly acquainted with what had been achieved.

The co-operation of industry was required and this often demanded considerable resources.

In the field of agriculture it depended largely on further research and extension work by the State Government departments.

Better liaison between the scientist and the extension officer were vital.

Mr. E. W. Harding (A.L.P. —Queensland) said that CSIRO was one of the most useful bodies we had in Australia and its achievements could never be assessed in money value.

Mr. Harding referred to the Division of Tropical Pastures and to its Townsville Laboratory, which, he said, was making a valuable contribution to the development of northern Queensland and to the city of Townsville.

Mr. G. W. Shaw (Country Party — Queensland) said that CSIRO had grown in stature over the years until it now held an honoured position in the scientific field not only in Australia but in the whole world.

Referring to the decision to close down the CSIRO Sugar Research Laboratory, he said that he hoped CSIRO would maintain its association with the sugar industry by providing finance for the Sugar Research Institute.

Dr. W. T. Gibbs (Liberal Party — Queensland) said that much of CSIRO's work had a fundamental bearing upon the development of Australia.

The only responsible way in which one could set about solving the problems affecting national development was to institute exhaustive investigations by experts.

Mr. M. D. Cross (A.L.P. — Queensland) said that there was a need for some comprehensive document setting out particulars of the scientific research done in Australia.

Both the Department of National Development and CSIRO had done good work within the restrictive frameworks within which they operated today.

There were numerous problems in the fields covered by both organizations and by the various State departments which were not being adequately looked at today.

For example, there was the problem of co-ordination and integration of scientific investigation to prevent overlapping in research.

Any proper research programme required flexibility in its budget allocation.

It should be possible, he said, to guarantee an organization like CSIRO a certain amount of money each year for a period of say five years and to allow the organization some flexibility in the way it spent the money.

Mr. M. D. CROSS

Mr. Cross said that the Labor Party's main proposals for science and technology were:

- A Minister with direct responsibility for science and technology.
- An Australian Science Council, with a rotating membership of senior academic, industrial and governmental scientists and a secretariat to assist Parliament and the Minister on science and technology.
- A Parliamentary Standing Committee on Science and Technology charged with reviewing policy on science and technology, and the scientific aspects of general governmental policy.
- Increased expenditure on scientific and technological research and development, and the introduction of long term budgeting for this.

Mr. J. A. Pettitt (Country Party — N.S.W.) said that perhaps no other organization had done more for Australia than CSIRO.

Its work on myxomatosis had helped production in Australia more than any other single development for which it had been responsible.

CSIRO had also done tremendous work in the development of secondary industries, he said, particularly in fields such as the processing of textiles.

Australia was running no risk at all in spending vast sums on an organization that had done such magnificent work as CSIRO.

News In Brief

Professorship

Dr. P. Mason of the Division of Protein Chemistry has been appointed Professor of Physics in the School of Mathematics and Physics at Macquarie University. Dr. Mason will take up his new appointment early next year.

Visitor

Professor H. G. Hecht of the Department of Chemistry at Texas Technological College has been selected as Fulbright Exchange Scholar by the Aus-

Professor H. G. HECHT

tralian American Educational Foundation. He is spending nine months with the Division of Chemical Physics where he is carrying out research in theoretical chemistry.

Fair Advice

The Chairman, Sir Frederick White, has been chosen to head a twelve-man advisory council to help develop plans for Australia's part in the World Exhibition in Montreal in 1967.

Announcing Sir Frederick's appointment, the Prime Minister, Sir Robert Menzies, said that the exhibition would be the centrepiece of celebrations to mark the centenary of Canadian confederation.

It was expected to attract from 30 to 50 million visitors in the six months from April to October, 1967.

Institute Chairman

Mr. W. T. Cooper of the Division of Coal Research has been chosen to succeed Professor N. Y. Kirov as National Chairman of the Institute of Fuel, Australian Membership.

Biography

Mr. Rohan Rivett has begun work on a biography of his father, the late **Sir David Rivett.** Mr. Rivett expects that his book will take about two years to complete.

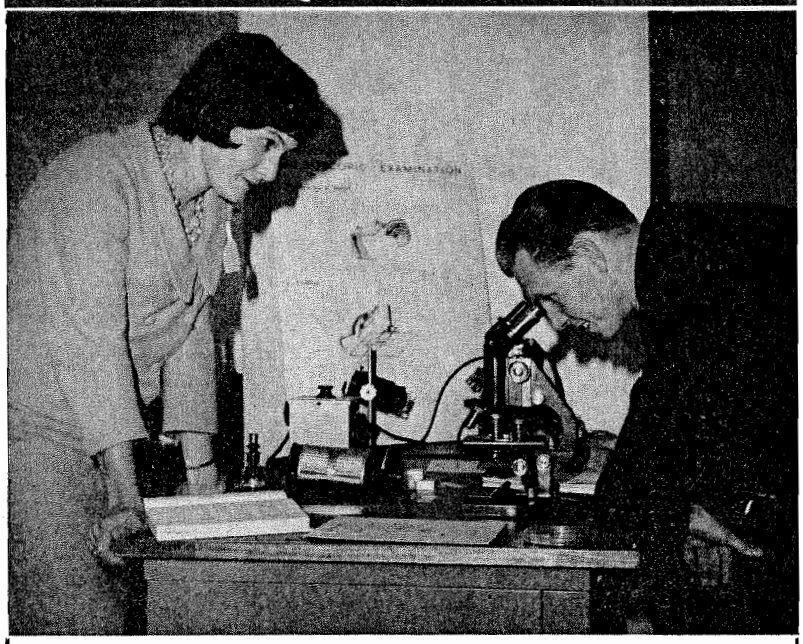
Trial and Tribulation

Mr. N. Hamilton of the Division of Building Research came third in the CSIRO car trial last October (see last page). Overcome with elation he succeeded in getting booked by the traffic police on the way home.

Plant Pathology Conference

The Organizing Committee of the 1966 Australian Plant Pathology Conference has decided to hold the Conference at Toowoomba, Queensland, from 30th October to 4th November.

NEW TECHNIQUES IN FOOD SCIENCE



Last month the Division of Food Preservation held two technical days at Dairy Research, Highett to demonstrate new laboratory techniques for use in the food industry. About one hundred people from all branches of the food industry in Victoria, South Australia, and Tasmania attended. Our picture shows one of the visitors examining a slide in a demonstration of the microbiological examination of canned foods. On the left is Miss Andrea Voigt, one of the guides provided by the Division of Dairy Research.

Screen News

The 314 Film Society will screen "The Love Cage" at Head Office on Thursday, 16th December, at 8 p.m.

ANALOGUE COMPUTER COMMISSIONED

The first model delivered of the world's most powerful series of analogue computers was officially commissioned in Melbourne on 23rd November by the Chairman, Sir Frederick White.

Known as the EAI 8800, the computer, valued at just over £100,000, has been installed at the Division of Chemical Engineering.

Developed by Electronic Associates Inc., of New Jersey, the 8800 has been ordered in quantity in the United States and Europe, but the system for CSIRO is the first to be delivered anywhere in Australia or overseas.

The capacity of the system can be greatly increased if the volume of work demands.

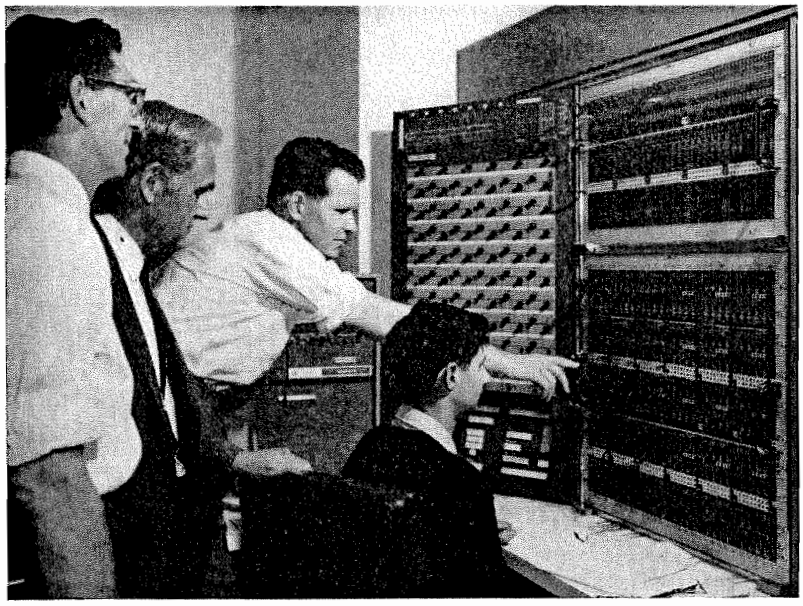
The analogue system will be housed and operated by the Division of Chemical Engineering but will be freely available to all Divisions.

The analogue machine is better described as a simulator rather than a computer, since it does not compute in the usual numerical way, but simulates a physical system by setting up an analogous electrical system.

The continuous variables of the problem are represented in the analogue by voltages.

Last October, thirty people from CSIRO and from several outside organizations attended a training course conducted by EAI for users of the 8800.

Our picture below shows, from left to right, Mr. R. A. Rizzoli of Monsanto, Dr. H. R. C. Pratt, Chief of the Division of Chemical Engineering, and Mr. M. J. Cumming and Mr. D. C. Dent of the same Division discussing the operation of the new computer.



Computing at a Distance

Last October, Mr. M. Kovarik of the Division of Mechanical Engineering "talked" to a computer several miles away by microwave signals and got an answer back.

Mr. Kovarik has been looking at the problems of would-be computer users who cannot afford computers of their own. One approach is to transmit information to a computer by microwave link.

The computer, having worked out the answer can then transmit it back through the same channel.

Mr. Kovarik beamed his questions from his laboratory at Highett to the Organization's Control Data 3200 computer at the Division of Chemical Physics, Clayton.

The computer replied immediately.

The microwave link will be used to explore the possibilities of distributing the power of a large computer between several users without any delay.

At present, research workers at Highett have to send a driver seven miles to Clayton with any questions for the computer.

Often the questions are not returned by car for more than twenty-four hours.

A teleprinter or telephone cannot carry the patterns which a computer needs to work on.

The only alternative to a microwave link is a co-axial cable which is costly and difficult to install.

With the microwave link, 30 characters can be sent and received each second.

The microwave link is expected to acquire fluency in several computer languages.

At present, however, it only understands a few orders such as "77-77", which means "stop whatever you are doing in the next micro-second".

It is not yet possible to ask the computer meaningful questions but the link should be fully operational by Christmas.

The microwave equipment used was picked up at an R.A.A.F. disposals sale.

SAFETY NOTES

Mouth-to-Mouth Resuscitation

Mouth-to-mouth resuscitation should be applied immediately a person has stopped breathing, or is breathing weakly, as a result of drowning, electric shock, lightning, suffocation, heart attack or serious accident.

Where possible, lay patient on his back. If this can't be done start resuscitation where he is. Every moment counts. In the case of electric shock switch off power first. Have someone call a doctor.

Turn patient's head from side to side and clear his mouth and throat. Tilt his head back as far as possible to open his air passage and to keep his tongue out of his throat.

Pinch patient's nose closed and take a quick deep breath.

Place your mouth over patient's mouth and breathe into him until his chest rises. For babies, place your mouth over both mouth and nose and just puff.

Remove your mouth and let patient's chest fall. Listen for gurgling which indicates an obstruction in the throat.

Make your first ten breaths fast and then continue at ten to fifteen per minute. Continue until patient recovers.

In drowning cases over-inflation of lungs may cause damage so blow only until chest begins to rise.

J. W. Hallam, Safety Officer

APPOINTMENTS TO STAFF

Dr. C. W. Ford arrived recently from Britain to join the Division of Tropical Pastures. He will study seasonal changes in the carbyhydrates of subtropical legumes and pastures. Dr. Ford graduated B.Sc. with honours from the University of Edinburgh in 1961. He obtained his Ph.D. from the same university in 1964 for his work on carbohydrates synthesized by diatoms.

Dr. D. G. Hawthorne has been appointed to the Division of Applied Mineralogy where he will work on mineral-organic complexes. Dr. Hawthorne graduated B.Sc. from the University of Melbourne in

Dr. D. G. HAWTHORNE

1959 and M.Sc. from the same university in 1961. He recently obtained his Ph.D. from the University of Melbourne for his work on the chemistry of the naptho (1,8-b,c)—thiophene system.

Dr. C. H. Burton has been appointed to a post-doctoral fellowship in physics with the magnetic and dielectrics group of the Division of Applied B.Sc. with honours from the University of Queensland in 1962, Dr. Burton has been

Dr. C. H. BURTON

Physics. Since graduating studying at the University for his Ph.D.

Miss J. D. Hayhurst will arrive in Sydney shortly from Britain to take up an appointment with the Computing Research Section. She will be concerned mainly with helping users of the Control Data 3200 computer in Sydney with their programming problems. Miss Hayhurst worked with the Division of Food Preservation from 1955 until 1963 when she graduated B.Sc. with honours from the University of New South Wales. For the last two years she has been a research assistant at the Imperial College of Science and Technology, London.

Dr. J. D. Hesketh arrived in Canberra from the United States last month to take up a post-doctoral fellowship in plant physiology at the Division of Plant Industry. He will work on photosynthesis and respiration in crop and pasture plants, particularly in relation to environmental conditions. Dr. Hesketh graduated B.Sc. from the University of Maine in 1956 and M.Sc. from Cornell University in 1958. He obtained his Ph.D. from Cornell in 1961 and after three years at the Connecticut Agricultural Experiment Station was appointed Assistant Professor of Plant Breeding at the University of Arizona in 1964.

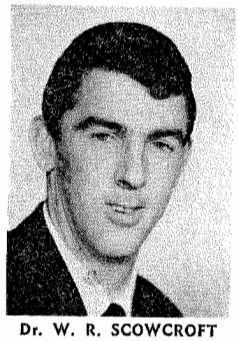
Dr. A. J. Morton has been appointed to a post-doctoral fellowship in solid state physics with the Division of Tribophysics where he will study crystal defects and their effects on physical properties such as electrical resistivity and plastic deformation. Dr. Morton

Dr. A. J. MORTON

graduated B.Sc. with honours from the University of New South Wales in 1960 and Ph.D. from the same university in 1963. He was awarded a CSIRO Overseas Studentship in 1963 and has spent the last two years at the Department of Mining, Metallurgy and Petroleum at the University of Illinois.

Mr. K. J. Hole arrived in Sydney recently from Britain to join the Division of Coal Research. He will work on the kinetics of free radical reactions relevant to combustion and pyrolitic reactions in the gaseous phase. Mr. Hole graduated B.Sc. with honours from the University College of South Wales and Monmouthshire in 1962 and for the last three years has been studying the kinetics of thermal decomposition reactions.

Mr. M. N. McLeod has been appointed to the Division of Tropical Pastures. He will carry out plant analyses at the Cooper Laboratory at Lawes as part of the Division's work on the evaluation of tropical pasture plants. Mr. McLeod graduated B.Sc. from the University of Queensland in 1949 and has been a biochemist with the Commonwealth Department of Health for the last sixteen years.



Dr. W. R. SCOWCROFT

Dr. W. R. Scowcroft has been appointed to the Division of Plant Industry as a senior geneticist in the field of quantitative inheritance. Since graduating B.Sc.Agr. from the University of Sydney in 1961 he has been studying at the Department of Genetics of the University of California where he recently obtained his Ph.D.

Mr. R. K. Kunimoto a recent science graduate of the University of Hawaii has been appointed to the Division of Entomology and will work in Hawaii on the biological control of lantana. Mr. Kunimoto will study the feeding behaviour and host range of a number of insects which attack lantana.

Dr. P. S. B. Stewart arrived in Australia last October from England to join the Division of Chemical Engineering where he will work on the desalination of sea water and brackish waters. Since graduating B.Sc.

Dr. P. S. B. STEWART

with honours from the University of New South Wales in 1962, Dr. Stewart has been studying for his Ph.D. in the Department of Chemical Engineering at the University of Cambridge.

On Sunday, 17th October, fifty-eight adventurous motorists and their crews from eight Melbourne Divisions took part in a CSIRO car trial in the Dandenong ranges just outside Melbourne. The winner was Mr. C. Wagg of the Division of Meteorological Physics with a loss of 27 points. The team event was won by Head Office. Our picture shows Miss Helen Agius and Mr. P. Dorling of the Division of Forest Products checking an entrant at one of the control points.

As a result of the interest shown in the event an attempt is being made to form a car trial committee to organize future events. Mr. R. Thompson of the Division of Forest Products would be glad to hear from anyone interested.

Finance for Housing

Some ten years ago, an arrangement was made with the A.M.P. Society to provide CSIRO officers with housing finance.

Since then 111 officers have been granted housing loans totalling £444,330.

Members of the Organization recommended by CSIRO may borrow up to 80% of the value of the security offered.

This is more generous treatment than that normally extended to other clients of the A.M.P. Society.

The officer must take out an insurance policy to cover the amount of the housing loan. An existing life insurance policy with the Society is satisfactory collateral.

Current interest rates are 6¼% per annum for a loan up to £4,000 and 6½% for a loan over £4,000 but not exceeding £6,000. Over £6,000 the rate is 7%.

Interest is calculated on the basis of a reducing monthly balance and interest rates are subject to change from time to time.

There is no formal limit on the amount of a housing loan. This is governed by the valuation placed on the security offered and the Society's assessment of the officer's ability to meet the loan repayments and the instalments on his insurance policy.

As a general rule the Society is not anxious to advance money on a property outside the metropolitan area of a capital city.

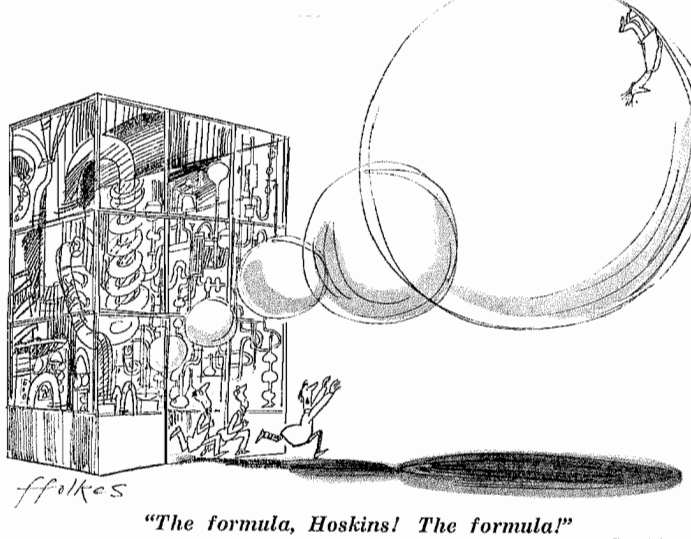
This rule is relaxed, however, in the case of some of the larger provincial cities such as Geelong, in which the A.M.P. Society has its own offices.

The period of the loan can be for 15, 20, or 25 years, depending on the financial situation of the officer concerned.

Valuation fees are charged by the Society on the basis of £5 for existing homes and £8 for propositions involving new buildings.

Any officer wishing to take advantage of the housing finance available from the A.M.P. Society should contact the Finance Manager, Mr. R. W. Viney, Head Office, 314 Albert Street, East Melbourne.

All enquiries will be treated as confidential.



"The formula, Hoskins! The formula!"

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