

SCIENTIFIC AND INDUSTRIAL RESEARCH IN AUSTRALIA

THE sixteenth annual report of the Department of Scientific and Industrial Research, Commonwealth of Australia, covers the year ended June 30, 1942. A large part of the Department's activities is now devoted to the solution of problems arising out of the War, and to assistance and advice to various Government Departments and other institutions and organizations concerned with the war effort, reference to which activities is confined to brief statements or omitted entirely. Among such investigations are those on flax production, vegetable seed production, the possibilities of native and exotic Australian plants for rubber production, the planting and testing of rubber-producing plants from various parts of the world, the storage of foodstuffs and wool and the development of special rations and high vitamin-content extracts for the use of the various Services.

Plant investigations in the field of vegetable fibres have included studies of the microbiology of dew retting and of the actual process of retting to ascertain whether improvement is possible in practice, investigations on pastures and weeds as well as on fruit, although that on general storage disorders has been curtailed. Potato investigations have included a study of virus disease, and a study of the effects of virus *X* on yield has been concluded. Tobacco investigations have been curtailed; but drug-plant investigations have included the extraction of hyoscyne and atropine, opium alkaloids, digitalis, ephedrine, ergot, quinine and strychnine, santonin and felix-mas, pyrethrum and native plants as sources of medicinal drugs.

Entomological investigations have covered insect pests in stored wheat and in stored wool, including tests of possible control methods, the insect control of noxious weeds, as well as sheep blow-fly. Other work has been concerned with the development of fly and mosquito sprays, the control of the Australian plague locust, and tests of insecticides designed to control the red-legged earth mite in pasture land. Nutrition investigations at the Animal Health Research Laboratory, Melbourne, have covered pleuro-pneumonia of cattle and mastitis in dairy cattle, while the McMaster Animal Health Laboratory has continued its studies on the administration of phenothiazine, investigations on the efficiency, and economy in the use, of anthelmintics and on external parasites of sheep.

The field staff of the Division of Soils has continued its work, but on a smaller scale, and the Division has also continued spectrochemical work on soils, including a survey of the metallic composition of surface soil at the Waite Institute, problems of anion exchange, with particular reference to the fixation of phosphoric acid, and the determination of small amounts of copper in soil and its availability to plants. No new major lines of investigation have been commenced by the Forest Products Division. Work has continued on the study of fundamental problems on behalf of the Australian pulp and paper industry on the investigation of wood structure in relation to properties, timber seasoning and timber physics, and on wood preservation, as well as on veneering and glueing.

The re-organization of the Division of Food Preservation and Transport has been completed, and all its officers are now engaged on problems of direct

importance to the war effort, and chiefly those relating to the canning and drying of foodstuffs. Many investigations on cold storage have been temporarily abandoned. The great expansion in vegetable canning has raised many problems in general canning technology which the Division has been called upon to solve, and the Division undertook a broad investigation into the effect of each step in the canning process on the loss of vitamins in canned vegetables, especially the green-leaf vegetables, cabbage and silver beet. The canning of bacon rashers has been a major investigation. The problem has been to give canned bacon a heat treatment adequate to prevent spoilage and yet not so severe as to destroy the quality of the pack, particularly in relation to texture and form of the rashers. Investigations into substitute materials for the manufacture of foodstuff containers have been carried out. With regard to dried foodstuffs, investigations during the year have been concerned with dried eggs and vegetables. In connexion with experiments on skin coatings for apples, nine different fungicides are being tested for use as control agents to prevent mould waste. Fruit storage investigations on apples have covered the preparation of emulsions of wax, oil, and mixtures of wax and oils, and of their effects on water-loss from fruit and on the resistance of the fruit to the diffusion of oxygen and carbon dioxide. Fundamental work is being conducted on the effect of the thickness of various skin coatings in relation to the size, maturity and the variety of fruit and the temperature of storage.

Fisheries investigations have covered a wide range with a view to the possible development of pelagic fisheries, including investigations on tuna, pilchards and anchovy, and the improvement of methods of mass catching of inshore fish such as salmon for cannery purposes. A survey of the distribution and biological characteristics of edible and other sharks has been inaugurated with the view of stabilizing or, if possible, increasing the supply of oils rich in vitamins from the recently established successful fish-oil industry. Research on agar has been intensified, and studies have been commenced on the preparation of carrageen (Irish moss).

The activities of the National Standards Laboratory have again been largely directed to defence work, including the examination of gauges and measuring equipment, calibration of testing machines, the testing of optical munitions instruments, measurement of the optical properties of melts of optical glass manufactured in Australia, and pyrometry calibration for the Ministry of Munitions. The Aeronautical Division has been increased considerably during the last two years, and is co-operating closely with the Australian Advisory Committee on Aeronautics. The development of methods of construction with synthetic resins is proceeding satisfactorily, and the position in regard to testing equipment for engines has been considerably improved. The Instruments Section has designed and constructed a noisemeter, a recording accelerometer and resistance strain gauges. The Division of Industrial Chemistry has carried out further investigations on the Freney-Lipson process for reducing the shrinkage of wool as well as on the Woolindras process. Attention has also been concentrated on fellmongering, including a physical method of following the depilation of sheepskins, the mechanism of sweating, chemical sterilization of sheepskins and identification of bacteria capable of depilating sheepskins. Attention has also been given

to physico-chemical investigations on the flotation of sulphide and non-sulphide ores, and to foundry sands; and an investigation on ethylene as a starting material for the synthesis of commercially valuable organic chemicals has been initiated, including the manufacture of ethylene chlorohydrin. Investigations in the field of synthetic resins have also been commenced, and the building up of a research organization for dealing with friction, lubrication, bearing and wear problems has been continued under which investigations on the theory of metallic friction and the role of shearing and ploughing and on the friction of thin metallic films have been carried out. Other investigations in this field have been concerned with the testing of bearing metals and bearings, the mechanism of lubrication, extreme pressure lubricants, cutting fluids, and the development of lubricants for drawing and pressing, as well as the lubrication and wear of piston rings and cylinders, and the wear and oil-contamination of producer-gas vehicles.

FORTHCOMING EVENTS

(Meeting marked with an asterisk * is open to the public)

Saturday, December 18

INSTITUTE OF PHYSICS (ELECTRONICS GROUP) (at the Royal Society, Burlington House, Piccadilly, London, W.1), at 2.30 p.m.—Dr. L. Jánossy: "Cosmic Rays".

ROYAL PHOTOGRAPHIC SOCIETY (SCIENTIFIC AND TECHNICAL GROUP) (Joint meeting with the ASSOCIATION FOR SCIENTIFIC PHOTOGRAPHY) (at 16 Prince's Gate, South Kensington, London, S.W.7), at 2.30 p.m.—Exhibition of Scientific Photographic Apparatus.

Monday, December 20

ROYAL GEOGRAPHICAL SOCIETY (at Kensington Gore, London, S.W.7), at 5 p.m.—Mr. Evert Baranger: "Some Problems of Central Asian Exploration" (Tenth Asia Lecture).

NORTH-EAST COAST INSTITUTION OF ENGINEERS AND SHIPBUILDERS (at the Mining Institute, Newcastle-upon-Tyne), at 6 p.m.—Mr. W. Muckle: "Some Considerations in the Application of Light Alloys to Ship Construction".

Tuesday, December 21

UNION DES INGENIEURS ET TECHNICIENS DE LA FRANCE COMBATTANTE (at the Institution of Mechanical Engineers, Storey's Gate, St. James's Park, London, S.W.1), at 4.30 p.m.—Colonel P. Baranger: "La Reconstruction et l'Education technique".*

ROYAL ANTHROPOLOGICAL INSTITUTE (at 21 Bedford Square, London, W.C.1), at 1.30 p.m.—Dr. Otto Friedmann: "Some Czechoslovak Folkways".

APPOINTMENTS VACANT

APPLICATIONS are invited for the following appointments on or before the dates mentioned:

SCIENCE TEACHER at the Flint Day Continuation School—The Director of Education, County Education Offices, Mold, Flintshire (December 24).

LECTURER IN SCIENCE at the F. L. Calder College of Domestic Science (to be responsible for the teaching of Science applied to Domestic Subjects and of Hygiene)—The Director of Education, Education Offices, 14 Sir Thomas Street, Liverpool 1 (December 27).

ASSISTANT TEACHER OF MATHEMATICS at the Selby Art School and Technical Institute—The Secretary to the Managers, Education Offices, Garforth, near Leeds (December 31).

SPECIALIST TEACHER OF STAMMERING—The Director of Education, Education Offices, Burnley (December 31).

LECTURER IN HIGH VOLTAGE ENGINEERING, and an **ASSISTANT LECTURER IN MECHANICAL ENGINEERING**—The Registrar, College of Technology, Manchester 1 (December 31).

TEACHER IN ENGINEERING SUBJECTS (possessing Graduate or equivalent qualifications in Mechanical Engineering and Industrial experience) at the Melton Mowbray and District County Technical College—The Director of Education, County Education Office, Grey Friars, Leicester (January 6).

GRADUATE (temporary) FOR MECHANICAL OR CIVIL ENGINEERING SUBJECTS, together with **MATHEMATICS**, at the Denbighshire Technical College, Wrexham—The Director of Education, Education Offices, Ruthin, Denbighshire (January 8).

Acting full-time DEMONSTRATOR OF ANATOMY—The Dean, Medical College, St. Bartholomew's Hospital, London, E.C.1 (January 11).

ENTOMOLOGIST in the Department of Agriculture, Salisbury, Southern Rhodesia—The Official Secretary, Office of the High Commissioner for Southern Rhodesia, 42B Strand, London, W.C.2 (January 31).

LECTURER ON PHYSICS—The School Secretary, St. Mary's Hospital Medical School, London, W.2 (February 1).

ASSISTANT ENGINEERS (CIVIL) for the Government Railways in West Africa—The Ministry of Labour and National Service, Central (Technical and Scientific) Register, Advertising Section, Alexandra House, Kingsway, London, W.C.2 (quoting Reference No. E.778A).

DOCKYARD MANAGER for the Sudan Railways (candidates should be fully trained Marine Engineers holding University Engineering Degree or A.M.I.Mech.E. or A.M.I.N.A.)—The Ministry of Labour and National Service, Central (Technical and Scientific) Register, Advertising Section, Alexandra House, Kingsway, London, W.C.2 (quoting Reference No. C.1966a).

ASSISTANT MASTER or MISTRESS to teach GEOGRAPHY, and an **ASSISTANT MASTER FOR ENGINEERING**, in the Burton-upon-Trent Technical Institute and Junior Technical School—The Secretary and Director of Education, Education Offices, Guild Street, Burton-upon-Trent.

CHIEF TECHNICAL OFFICER—The Secretary, Warwickshire War Agricultural Executive Committee, 6 Guy's Cliffe Avenue, Leamington Spa.

TEACHER (temporary) OF MATHEMATICS to junior engineering students—The Principal, County Technical College and School of Art, Newark, Notts.

GRADUATE ASSISTANT to teach PHYSICS (Industrial and teaching experience desirable), and a **GRADUATE ASSISTANT** for subjects up to Higher National Certificate standard in MECHANICAL ENGINEERING (candidates must have had practical experience in Engineering and be able to teach ELECTRICAL ENGINEERING to the Ordinary National Certificate standard), at the West Hartlepool Technical College and Technical Day School for Boys—The Chief Education Officer, Education Offices, Park Road, West Hartlepool.

SPEECH THERAPIST in School Clinics for the Remedial Treatment of Stammering and other Speech Defects—The Director of Education, Education Offices, Todmorden, Yorks.

GRADUATE ASSISTANT MASTER FOR ENGINEERING SUBJECTS WITH MATHEMATICS in Day Technical School and Evening Institute—The Principal, Technical Institute, 28 Beckenham Road, Beckenham, Kent.

REPORTS and other PUBLICATIONS

(not included in the monthly Books Supplement)

Great Britain and Ireland

British Rubber Producers' Research Association. Publication No. 37: Rubber, Polyisoprenes and Allied Compounds, Part 4: The Relative Tendencies towards Substitutive and Additive Reaction during Chlorination. By G. F. Bloomfield. Pp. 8. Publication No. 38: The Course of Autoxidation Reactions in Polyisoprenes and Allied Compounds, Part 3: The Oxidation of Rubber in the Presence of Acetic Acid or Acetic Anhydride. By G. F. Bloomfield. Pp. 6. (London: British Rubber Producers' Research Association.) [81]

Transactions of the Royal Society of Edinburgh. Vol. 61, Part 1, No. 2: The Archaean Rocks of the Rodil District, South Harris, Outer Hebrides. By Dr. Charles F. Davidson. Pp. 71-112+3 plates. (Edinburgh and London: Oliver and Boyd, Ltd.) 6s. 3d. [81]

Board of Education. Educational Pamphlet No. 119: Sex Education in Schools and Youth Organisations. Pp. ii+22. (London H.M. Stationery Office.) 6d. net. [81]

Recruitment and Supply of Teachers: a Short Term Policy for an Emergency. Pp. 12. (London: National Union of Teachers.) [81]

Other Countries

Smithsonian Institution. War Background Studies, No. 15: Iceland and Greenland. By Austin H. Clark. (Publication 3735.) Pp. iv+104+21 plates. (Washington, D.C.: Smithsonian Institution.) [410]

Proceedings of the American Philosophical Society. Vol. 87, No. 2 (August 16, 1943): Symposium on Post-War Problems: Papers read before the American Philosophical Society, Midwinter Meeting, February 19-20, 1943. Pp. iii+121-198. (Philadelphia: American Philosophical Society.) [410]

British Honduras. Abridged Report of the Forest Department for the Year ended 31st December 1942. Pp. 8. (Belize: Government Printer.) [510]

Trinidad and Tobago: Forests Department. Administration Report of the Conservator of Forests for the Year 1942. Pp. 6. (Trinidad: Government Printer.) 6 cents. [1110]

Government of India: Department of Labour. Triennial Review of Irrigation in India, 1936-1939. Pp. 62. (Delhi: Manager of Publications.) 2.6 rupees; 4s. [1110]

Bericht über das Geobotanische Forschungsinstitut Rübel in Zürich für das Jahr 1942. Von E. Rübel und W. Lüdi. Pp. 88+7 plates. (Zürich: Geobotanische Forschungsinstitut Rübel.) [1210]

Government of Travancore. Administration Report of the Government Museum for 1117 M.E. Pp. ii+6. (Trivandrum: Government Press.) [1310]

U.S. National Museum. Bulletin 100, Vol. 14, Part 2: Contributions to the Biology of the Philippine Archipelago and adjacent Regions—Descriptions and Figures of New Fishes obtained in Philippine Seas and adjacent Waters by the United States Bureau of Fisheries Steamer *Albatross*. By Henry W. Fowler. Pp. iii+63-92. (Washington, D.C.: Government Printing Office.) 10 cents. [1310]

Proceedings of the United States National Museum. Vol. 93, No. 3167: New Species of Buprestid Beetles of the Genus *Agilus* from Trinidad. By W. S. Fisher. Pp. 375-380. Vol. 93, No. 3168: Some Fungus Beetles of the Family Endomychidae in the United States National Museum, mostly from Latin America and the Philippine Islands. By H. F. Strohecker. Pp. 381-392. (Washington, D.C.: Government Printing Office.) [1310]

Academy of Natural Sciences of Philadelphia. Monograph No. 4: The Scrophulariaceae of the Western Himalayas. By Francis W. Pennell. Pp. viii+164+25 plates. (Philadelphia: Academy of Natural Sciences.) [1310]