

Bald* also finds that potato rugose mosaic (viruses X+Y) reduces the yield to about 50 per cent that of healthy plants, and the reduction is proportional to the diminution of leaf area caused by the disease.

The economic significance and complex nature of the virus problem make it one of the major challenges to modern biological investigation. A patient amassing of the facts, as typified by the eight papers here reviewed, is manifestly the only sure way of approach, and it is not until this is accomplished on a wide scale that any great practical results can be expected.

JOHN GRAINGER

* *Brit. J. Exp. Path.*, 27, 81 (1946).

† *Ann. App. Biol.*, 33, No. 1, 13 (1946).

‡ *Ann. App. Biol.*, 33, No. 1, 66 (1946).

§ Bawden, F. C., and Kassanis, B., *Ann. App. Biol.*, 33, No. 1, 46 (1946).

¶ *J. Coun. Sci. and Ind. Res.*, 18, No. 3, 219 (1945).

‡ *J. Coun. Sci. and Ind. Res.*, 18, No. 3, 209 (1945).

‡ *Phytopath.*, 35, No. 8, 591 (1945).

‡ *Phytopath.*, 35, No. 8, 585 (1945).

BANANA LEAF SPOT

THE leaf spot disease of bananas, caused by *Mycosphaerella musicola* Leach (*Cercospora musae* Zimm.), long known as a destructive malady in the Australasian region, was not observed in the New World until 1934, when a small outbreak was observed in Trinidad. This was soon followed by news of the disease in Suriname, Jamaica and Central America, and the Caribbean region generally. In the course of the few years during which the disease waxed to epidemic proportions it was under constant observation. Hence it may fairly be claimed that among plant epidemics the leaf disease of bananas is among the most fully documented and best known scientifically. The progress of the disease has been marked by a number of important advances in our knowledge, such as the details of infection, the progressive development of symptoms in plantations, and the ultimate effects of the disease on commercial fruit intended for refrigerated transport overseas. Not least important, as a result of imaginative innovations on a gigantic scale, the large fruit companies operating in Central America showed how the disease could be controlled by frequent spraying with appropriate fungicides.

The Colony of Jamaica, with its many and varied types of banana plantation, large and small, on hillside and plain, presented special difficulties in the matter of disease control. It was realized that further investigations both of a fundamental and applied character were necessary if rational control measures were to be forthcoming. To this end Mr. R. Leach was appointed as mycologist for the investigation of leaf disease. His report, the result of four years of work, is now before us (R. Leach, "Banana Leaf Spot", Dept. Agric. Jamaica, Govt. Printer, Kingston, pp. 118, illustrated, 2s.). This work, largely based on direct field studies of the pathogen, covers a great deal of new and interesting ground and can only be dealt with summarily here. What, in brief, Leach set out to do was to obtain, by direct observation and experiment, a comprehensive knowledge of the main features of the disease on which basic principles of control could be developed. In the course of these studies, not only was the ascigerous stage of the pathogen discovered, but also it was found that there were differences in symptoms between ascospore and conidial infections; and that a peculiar relationship existed between soil conditions and the

type of fructification produced in the leaf spots. Certain soil conditions, which affect the metabolism of the leaves, are attended by the development of an abnormally large number of perithecia throughout the year, ascospore infection being reduced only during the colder months. The adverse soil factors include poor aeration, marked fluctuations in the oxidation/reduction conditions, and shallow tith layers. Hence the importance, particularly in Jamaica, of measures designed to conserve fertility by attention to drainage, maintenance of soil structure, etc.

The details of spot development, and their distribution on the leaf surface; the development, dissemination, germination and viability of spores; the factors affecting infection; the principles of control by spraying; the seasonal variation in disease intensity; and other matters have been the subject of close observation and experiment, the whole constituting a substantial body of fact and a real contribution to our knowledge of this important disease. Mr. Leach and the Jamaica Department of Agriculture are to be congratulated on having carried through to a successful conclusion this difficult and comprehensive series of investigations.

C. W. WARDLAW

FORESTRY IN UGANDA

IN the annual report of the Uganda Forestry Department for the year 1945 (Government Printer, Uganda, 1946), the objectives of the forest policy are laid down: first, to reserve in the State sufficient land either already under forest or capable of afforestation to maintain climatic conditions suitable to agriculture; to preserve water supplies; to provide forest produce for the agricultural industrial development, and to maintain soil stability in areas where the land is liable to deterioration if put to other uses; secondly, to manage the forest property of the State to the best financial returns, such as are consistent with the primary aims set out above; to encourage and assist the practice and science of forestry by native authorities, and private enterprise; and lastly, to foster by education and propaganda a real understanding among the people of Uganda of the value of forests to them and to posterity, and to educate selected Africans in technical forestry.

These objects and ambitions have been enumerated in one form or another in the British Empire ever since the Indian Forest Service was formed more than eighty years ago. In many parts of the Empire, however, extraordinarily little progress has been made, and by its unchecked utilization of available timber supplies both in and outside the Empire, which the late War necessitated, the attainment of these objectives might seem to be farther off than ever. But the institution of conservation boards in connexion with agriculture and forestry in many parts of the world gives hope that at length the policy so well outlined above, which practically covers the whole of the aims and objects of forestry, will be given effect to; and above all that the close interrelation between forestry and agriculture will at length be given some measure of recognition in Africa, both West and East.

It is a credit to Uganda that its Forestry Department is among the first to write and publish effective working plans for some of its forest areas. Local plans produced for local areas but not made public

afford little information as to the progress being made by a forestry department. As a last resort, professional progress of any standard is made manifest by means of a printed and published working plan, and in this Uganda has apparently taken a lead.

FORTHCOMING EVENTS

Monday, December 16

SOCIETY OF PUBLIC ANALYSTS AND OTHER ANALYTICAL CHEMISTS, BIOLOGICAL METHODS GROUP (at the Chemical Society, Burlington House, Piccadilly, London, W.1), at 6 p.m.—Annual General Meeting; at 6.30 p.m.—Miss M. Bruce: "The Assay of Anti-Thyroid Substances using ^{131}I "; Mr. E. C. Wood: "The Computation of Microbiological Assays of Amino-Acids and other Growth Factors".

INSTITUTION OF THE RUBBER INDUSTRY, MANCHESTER SECTION (at the Engineers' Club, Albert Square, Manchester), at 6.15 p.m.—Mr. J. M. Buist and Dr. D. A. Harper: "The Revision of British Standard Specifications for Vulcanised Rubber".

SHEFFIELD SOCIETY OF ENGINEERS AND METALLURGISTS (at the Royal Victoria Hotel, Sheffield), at 6.15 p.m.—Dr. Hugh O'Neill: "Some Recent Problems for Railway Metallurgists".

CHEMICAL SOCIETY, LEEDS BRANCH (in the Chemistry Lecture Theatre, The University, Leeds), at 6.30 p.m.—Prof. Harold C. Urey: "Isotopes".

Tuesday, December 17

ROYAL SOCIETY OF ARTS, DOMINIONS AND COLONIES SECTION (at John Adam Street, Adelphi, London, W.C.2), at 2.30 p.m.—Rt. Hon. Lord Edmon: "The Work of the Rhodes Trust".

EUGENICS SOCIETY (at the Royal Society, Burlington House, Piccadilly, London, W.1), at 5.30 p.m.—Mr. J. W. B. Douglas: "Social and Economic Problems of Childbearing in Britain—Report of a Questionnaire Inquiry".

INSTITUTE OF PHYSICS, ELECTRONICS GROUP (in Room 87, The Polytechnic, 309 Regent Street, London, W.1), at 5.30 p.m.—Prof. W. V. Mayneord: "Applications of Nuclear Physics in Medicine".

SHEFFIELD METALLURGICAL ASSOCIATION (at the Metallurgical Club, 198 West Street, Sheffield), at 6.30 p.m.—Dr. J. White: "The Physical Chemistry of Steelmaking Reactions".

SOCIETY OF DYERS AND COLOURISTS, HUDDERSFIELD SECTION (at Field's Café, Huddersfield), at 7.30 p.m.—Mr. A. Klinger: "A Survey of Continental Finishing".

Wednesday, December 18

INSTITUTE OF FUEL, YORKSHIRE SECTION (at the University, Leeds), at 2.30 p.m.—Dr. C. C. Hall: "Fischer-Tropsch Process—Present and Future".

CHEMICAL SOCIETY, NEWCASTLE-UPON-TYNE SECTION (joint meeting with the local sections of the ROYAL INSTITUTE OF CHEMISTRY, the SOCIETY OF CHEMICAL INDUSTRY, the INSTITUTE OF CHEMICAL ENGINEERS and the COKE OVEN MANAGERS' ASSOCIATION, in the Chemistry Lecture Theatre, King's College, Newcastle-upon-Tyne), at 6.30 p.m.—Dr. H. C. Craggs and Mr. H. M. Arnold: "Hydrogen Sulphide Removal by Ammoniacal Ferrocyanide Liquors".

CHEMICAL SOCIETY (at the Royal Institution, Albemarle Street, London, W.1), at 7.30 p.m.—Prof. Harold C. Urey: "Some Problems in the Separation of Isotopes" (Eleventh Liversidge Lecture).

SOCIETY FOR VISITING SCIENTISTS (at 5 Old Burlington Street, London, W.1), at 7.30 p.m.—"The New Place of Science in Higher Education" (Speakers: Sir J. E. Lennard-Jones, F.R.S., Prof. R. V. Southwell, F.R.S., Mr. J. T. Saunders and Sir Thomas Merton, F.R.S.).

Thursday, December 19

PHYSICAL SOCIETY, COLOUR GROUP (at the Royal Society of Arts, John Adam Street, Adelphi, London, W.C.2), at 3.30 p.m.—Discussion on the "Report of Defective Colour Vision in Industry" (to be opened by Dr. A. H. Gale, Mr. R. F. G. Holness, Dr. J. Sharp Grant, Prof. L. C. Martin and Dr. M. Abrahamson).

INSTITUTION OF MINING AND METALLURGY (at the Geological Society of London, Burlington House, Piccadilly, London, W.1), at 5 p.m.—Dr. W. David Evans: "The Geology and Opencast Mining of the Jurassic Ironstones of Great Britain"; Mr. N. W. Wilson: "Notes on the Estimation of Tonnage and Grade of some Chromite Dumps".

LONDON MATHEMATICAL SOCIETY (at the Royal Astronomical Society, Burlington House, Piccadilly, London, W.1), at 5 p.m.—Symposium on "The Geometry of Numbers" (arranged by Prof. H. Davenport, F.R.S.).

ROYAL STATISTICAL SOCIETY (at the London School of Hygiene and Tropical Medicine, Keppel Street, London, W.C.1), at 5.15 p.m.—Dr. John Wishart: "Statistical Aspects of Demobilization in the Royal Navy".

CHEMICAL SOCIETY, SOCIETY OF CHEMICAL INDUSTRY and ROYAL INSTITUTE OF CHEMISTRY, EDINBURGH AND EAST OF SCOTLAND SECTIONS (in the Biochemistry Lecture Theatre, the University, Teviot Place, Edinburgh), at 5.30 p.m.—Prof. Harold C. Urey: "Some Problems in the Separation of Isotopes" (Eleventh Liversidge Lecture).

INSTITUTION OF ELECTRICAL ENGINEERS (joint meeting with the INSTITUTION OF MECHANICAL ENGINEERS, at Savoy Place, Victoria Embankment, London, W.C.2), at 5.30 p.m.—Mr. C. H. Sparks: "The Future of Pulverized-Coal Firing in Great Britain".

ROYAL AERONAUTICAL SOCIETY (at the Institution of Civil Engineers, Great George Street, London, S.W.1), at 6 p.m.—Mr. J. Smith: "The Evolution of the Spitfire".

TEXTILE INSTITUTE, YORKSHIRE SECTION (at the Midland Hotel, Bradford), at 7 p.m.—Dr. A. B. Wildman: "The Microscopy of Fibres—Aids to their Identification".

Friday, December 20

INSTITUTION OF MECHANICAL ENGINEERS (at Storey's Gate, St. James's Park, London, S.W.1), at 5.30 p.m.—Mr. A. Sykes: "Progress in Turbine Gear Manufacture in Recent Years"; Mr. Cecil Timms: "The Measurement of Errors in Gears for Turbine Reduction Drives".

INSTITUTE OF FUEL, SCOTTISH SECTION (at the Royal Technical College, Glasgow), at 5.45 p.m.—Dr. E. A. C. Chamberlain: "Some Aspects of Domestic Heating Appliances".

SOCIETY OF DYERS AND COLOURISTS, SCOTTISH SECTION (at St. Enoch Hotel, Glasgow), at 7 p.m.—Discussion on the Report of the Committee on "The Dyeing Properties of Direct Cotton Dyes" (to be introduced by Mr. John Boulton).

APPOINTMENTS VACANT

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

LECTURER (man or woman) IN BIOLOGY—The Director of Education, Education Department, The Guildhall, Swansea (December 19).

SCIENTIFICALLY QUALIFIED OFFICER (temporary) in the Blood Transfusion Service in the North-West Region—The Regional Establishment Officer, Ministry of Health Regional Offices, Sunlight House, Quay Street, Manchester 3 (December 21).

ASSISTANT LECTURER IN ENGINEERING in the Bradford Technical College—The Director of Education, Town Hall, Bradford (December 21).

SCIENCE GRADUATE (Zoology) for bureau literary work—The Director, Imperial Bureau of Animal Health, Veterinary Laboratory, New Haw, Weybridge, Surrey (December 25).

ASSISTANT LECTURER IN MATHEMATICS, ASSISTANT LECTURER IN PHYSICS, and an ASSISTANT LECTURER IN CHEMISTRY—The Registrar, University College, Singleton Park, Swansea (December 27).

PROFESSOR OF CIVIL ENGINEERING, PROFESSOR OF MECHANICAL ENGINEERING, and PROFESSOR OF ELECTRICAL ENGINEERING, at the Thomason College of Engineering, Roorkee, U.P., India—The Office of the High Commissioner for India, General Department, India House, Aldwych, London, W.C.2, quoting No. 290 (December 28).

ORGANIC CHEMIST at Long Ashton Research Station—The Secretary and Registrar, The University, Bristol 8 (December 28).

ASSISTANT LIBRARIAN in the Medical Department—The Director, Appointments Department, British Council, 3 Hanover Street, London, W.1 (December 28).

BIOLOGIST, and a JUNIOR ASSISTANT PHYSICIST, in the Biophysics Research Group, and a JUNIOR ASSISTANT PHYSICIST in the Clinical Physics Department—The Secretary, Mount Vernon Hospital and Radium Institute, Northwood, Middx. (December 28).

EXPERIMENTAL OFFICERS (with qualifications in (a) Mechanical Engineering, (b) Electrical Engineering including radio, or (c) Mathematics including preferably aerodynamics), for abstracting and indexing of scientific and technical papers and reports, and an ASSISTANT EXPERIMENTAL OFFICER to assist in a technical library, at the Guided Projectiles Establishment, Westcott, Berks.—The Director of Scientific and Technical Administration (D), Room 27, Ivybridge House, John Adam Street, Strand, London, W.C.2, quoting No. D.1/46 (December 28).

GENERAL SECRETARY—The Secretaries, Chemical Society, Burlington House, Piccadilly, London, W.1 (December 31).

SENIOR LECTURER or LECTURER IN BIOLOGY and RURAL SCIENCE at the Burdop Park Emergency Training College for Men, Wroughton, Wilts.—The Director of Education, County Hall, Trowbridge, Wilts. (December 31).

RESEARCH ASSISTANT to take part in the Economic Survey of Northern Ireland and its relationship to the economy of Great Britain—The Secretary, Queen's University, Belfast (December 31).

LECTURER IN MINING, and a LECTURER IN ELECTRICAL ENGINEERING, at the Cannock Chase Mining College—The Director of Education (Dept. F.E.), County Education Offices, Stafford (January 1).

ASSISTANT CHIEF CHEMIST (Ref. F.1281.A), and a CHEMIST (Ref. F.1282.A), for large Oil Refinery in the South of England—The Ministry of Labour and National Service, Technical and Scientific Register, Room 572, York House, Kingsway, London, W.C.2, quoting the appropriate Ref. No. (January 4).

SENIOR POSTS (2) in the Television Section of Research Department—The Engineering Establishment Officer, British Broadcasting Corporation, Broadcasting House, London, W.1 (January 8).

LECTURER IN STATISTICS—The Secretary, The University, Aberdeen (January 15).

SENIOR LECTURER and a JUNIOR LECTURER IN ANIMAL HUSBANDRY at the Imperial College of Tropical Agriculture, Trinidad—The Secretary, Imperial College of Tropical Agriculture, Grand Buildings, Trafalgar Square, London, W.C.2 (January 20).

LECTURER IN CHEMISTRY at Natal University College—The Secretary, Universities Bureau of the British Empire, 24 Gordon Square, London, W.C.1.

ENTOMOLOGIST to carry out a survey of the tsetse areas of the Southern Sudan and undertake research work—The Sudan Agent in London, Wellington House, Buckingham Gate, London, S.W.1, endorsed "Veterinary Entomologist".

BOYANIST to carry out a survey of the grazing areas of the Sudan—The Sudan Agent in London, Wellington House, Buckingham Gate, London, S.W.1, endorsed "Pasture".

LECTURER or ASSISTANT LECTURER IN MATHEMATICS—The Registrar, University College, Exeter.