

A simple theoretical treatment of the propagation of waves through the lower atmosphere shows that account must be taken of the various paths by which rays can pass from transmitter to receiver, these rays being subject to diffraction, refraction or reflection on the way. The received signal is the resultant of the various rays received, and it is clear that interference effects may result from the arrival of two rays simultaneously by different paths. Sudden changes in the temperature and water vapour content in the atmosphere produce corresponding changes in refractive index and so cause marked bending of the rays transmitted. In regions of temperature inversion these conditions may be specially marked, resulting in the ray being completely bent over and returned to earth in a manner analogous to reflexion from a discontinuity.

An explanation of the lack of fading in bad weather and of the pronounced fading in good weather is sought in the fact that, in anticyclonic conditions, temperature inversions and associated sudden changes in relative humidity are usually present at heights of 1-2 miles, whereas in cyclonic or depression conditions these are absent. While the existence and diurnal variations of temperature inversions may be different over land and over sea, the general structure of the atmosphere in an anticyclone is probably the same in the two cases; in particular, changes in water vapour content may obtain over sea, which give rise to refraction in the lowest layers, and thus cause sufficient bending of the direct rays to account for the received signal and its variations. As mentioned above, rapid fading occurred mainly on the wave-length of 5 m. and was usually superposed on flat or steady records and was present only in winter. It is thought that this is probably a shimmering effect due to turbulence in the atmosphere during bad weather. A similar effect had previously been noted by Ross Hull in the United States and was attributed to the same cause.

A more detailed study of the radio phenomena on the above lines has not been possible on account of the limitations imposed by the nature of the meteorological information available at the place and for the period of the wireless observations. In future investigations, this limitation may be at least partly removed, by improved meteorological technique for studying conditions in the lower atmosphere, and by making arrangements for special and close co-operation between those responsible for the wireless and meteorological observations.

FORTHCOMING EVENTS

Monday, January 4—Wednesday, January 6

AGRICULTURAL EDUCATION ASSOCIATION (at the Midland Agricultural College, Sutton Bonington, Loughborough). Conference.

Monday, January 4

SOCIETY OF CHEMICAL INDUSTRY (FOOD GROUP, PLASTICS GROUP AND LONDON SECTION) (in the Royal Institution, Albemarle Street, London, W.1), at 2.30 p.m.—Prof. E. K. Rideal, F.R.S.: "Catalytic Hydrogenation" (Jubilee Memorial Lecture).

Friday, January 8

INSTITUTION OF MECHANICAL ENGINEERS (at Storey's Gate, St. James's Park, London, S.W.1), at 5.30 p.m.—Mr. C. C. Pounder: "Some Types of Propelling Machinery available to Shipowners" (Thomas Lowe Gray Lecture).

NORTH-EAST COAST INSTITUTION OF ENGINEERS AND SHIPBUILDERS (at the Mining Institute, Newcastle-upon-Tyne), at 6 p.m.—Mr. C. Le Maistre: "War-Time Standardization".

Saturday, January 9

ASSOCIATION OF SCIENTIFIC WORKERS (in the Lecture Theatre of the London School of Hygiene, Keppel Street, London, W.C.1), at 2.15 p.m.—Conference on Problems connected with the Organisation, Application and Personnel of the Medical Sciences. (Chairman: Dr. D. McClean.)

APPOINTMENTS VACANT

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

LECTURER IN MECHANICAL ENGINEERING—The Principal, Heriot-Watt College, Edinburgh (January 7).

ASSISTANT TO THE ADVISORY OFFICER IN ANIMAL HUSBANDRY—The Secretary, West of Scotland Agricultural College, 6 Blythswood Square, Glasgow (January 8).

WOMAN PSYCHOLOGIST for service at the Child Guidance Clinic—The Chief Education Officer, Education Office, Council House, Margaret Street, Birmingham 3 (January 9).

REGIUS PROFESSOR OF GEOLOGY at Edinburgh University—The Private Secretary, Scottish Office, Fielden House, 10 Great College Street, London, S.W.1 (January 11).

SCIENCE GRADUATE (BOTANY), with experience in abstracting and knowledge of languages desirable—The Deputy Director, Imperial Bureau of Plant Breeding and Genetics, Cambridge (January 16).

RUSSIAN TRANSLATOR to work on literature in Agricultural Botany—The Deputy Director, Imperial Bureau of Plant Breeding and Genetics, Cambridge (January 16).

HONOURS GRADUATE TO TEACH BIOLOGY in the Bede Collegiate Girls' School—The Director of Education, 15 John Street, Sunderland (January 18).

LABORATORY STEWARD for the Veterinary Laboratory—The Veterinary Investigation Officer, University College of North Wales, Bangor (January 18).

THREE JUNIOR ELECTRICAL INSPECTORS OF MINES—The Ministry of Labour and National Service, Central (Technical and Scientific) Register (Section D.521), Sardinia Street, Kingsway, London, W.C.2.

REPORTS and other PUBLICATIONS

(not included in the monthly Books Supplement)

Great Britain and Ireland

Why India? By Reginald Reynolds. Pp. 28. (London: War Resisters' International.) 6d. [2112]

Gas Research Board. Communication GRB7a: 33rd Report of the Refractory Materials Joint Committee. Abridged edition. Pp. 8. (London: Gas Research Board.) [2112]

Institution of Gas Engineers. Communication No. 249: Report of the Committee of Enquiry on Gas Quality. Pp. 10. Communication No. 250: Report of the Committee of Enquiry on Sulphur Removal. Pp. 10. Communication No. 251: Report of the Committee of Enquiry on Standardization of Appliances, Part 1: Domestic Gas Cookers. Pp. 16. Communication No. 252: Report of the Committee of Enquiry on Coke Quality, Part 1: Sizing of Coke. Pp. 8. Communication No. 253: 3rd Report of the Chairman's Technical Committee, 1941-42. Pp. 18. Communication No. 254: 19th Report of the Gas Education Committee, 1941-42. Pp. 24. (London: Institution of Gas Engineers.) [2112]

Other Countries

U.S. Department of Agriculture. Technical Bulletin No. 828: Further Studies on the Removal of Spray Residues from Eastern-Grown Apples. By M. H. Haller, C. C. Cassil, Edwin Gould and A. L. Schraeder. Pp. 32. (Washington, D.C.: Government Printing Office.) [2112]

British Honduras. Abridged Report of the Forest Department for the Year ended 31st December 1941. Pp. 4. (Belize: Forest Department.) [2112]

Forest Research Institute, Dehra Dun. Indian Forest Leaflet No. 22: Possible War-Time Sources of Vegetable Rubber in India. By T. V. Dent. Pp. iv+16. 4 annas; 6d. Indian Forest Leaflet No. 26: Rectangular Plywood Containers. Pp. ii+2+1 plate. 4 annas; 6d. Indian Forest Leaflet No. 27: Notes on some Aspects of Erosion Control. By Jagdamba Prasad. Pp. v+18. 4 annas; 6d. (Dehra Dun: Forest Research Institute.) [2212]

University of Bombay: Department of Chemical Technology. Annual Report, 1941-42. Pp. iv+28. (Bombay: The University.) [2212]

Smithsonian Miscellaneous Collections. Vol. 103, No. 5: New Upper Cambrian Trilobites. By Charles E. Resser. (Publication 3693.) Pp. iii+136. (Washington, D.C.: Smithsonian Institution.) [2412]

Annual Report of the Agricultural Department, Dominica, 1941. Pp. 4. (Roseau: Agricultural Department.) [2412]

Catalogues

A Catalogue of Books and Periodicals on Entomology, together with a Selection of Recently Acquired Books on General Natural History. (No. 606.) Pp. 24. (London: Bernard Quaritch, Ltd.)