

increases the efficiency of utilization of the telephone lines, the programme is subject to interruption by telephone calls, and it is found that a high level of broadcasting power, such as is used in the first method, cannot be transmitted directly through the lines.

A third method makes use of telephone lines, or lighting and power distribution lines, on which the programme is superimposed by means of a high-frequency carrier wave. In Japan this method has been adopted as the basic principle on which a wired broadcasting network may be established. While the percentage of telephone installations in Japan is low, the percentage of electric lighting is very high, being about 90 per cent, which is second to Switzerland's 99 per cent. The use of lighting and power lines together with telephone lines, therefore, would make it possible to develop an almost complete country-wide network.

Experiments on wired broadcasting in Japan have been going on since 1926 in the form of a carrier system over power and lighting lines. In 1935, broadcasting on high-frequency carriers was proposed by the Ministry of Communications. It is interesting to note that when wired broadcasting on high frequencies was introduced, the aims stressed were the relieving of the congestion in allotted wave bands due to the development of broadcasting, and the distribution of clear, stable, high-quality programmes. In the present crisis, the mission of wire broadcasting has been extended to the important tasks of protecting broadcasts from outside interception and preventing false broadcasts.

In surveying the possibilities in Japan of telephone lines as circuits for wired broadcasting it is found that the number of telephones per 100 persons is 3.80 in cities having populations of 50,000 or more, and 0.84 in towns of smaller population; hence the reception of broadcasts over telephone subscribers' lines is effective only in cities having a high percentage of subscribers. The use of telephone lines is especially necessary in cities where power cables are employed for supplying electricity. Thus telephone lines ought to be utilized as much as possible in the busiest sections of a city and in districts where power cables are used, whereas overhead power and lighting lines ought to be used in the suburbs, in towns and villages, and in cities having overhead power distribution lines. It was considered best to standardize the carrier frequency at 130 kilocycles. This value would be the frequency for the distribution of wired broadcasts to listeners all over the country.

FORTHCOMING EVENTS

[Meetings marked with an asterisk are open to the public.]

Tuesday, June 17

INSTITUTE OF PHYSICS (London and Home Counties' Branch) (in the Lecture Hall of Messrs. Kodak, Ltd., Harrow), at 6 p.m.—Dr. D. A. Spencer: "The Applications of Photography in Engineering".

Wednesday, June 18

BIRKBECK COLLEGE (Bream's Buildings, Chancery Lane, London, E.C.4), at 6 p.m.—Foundation Oration by His Grace the Lord Archbishop of York: "Education and Peace".

Thursday, June 19

CHADWICK PUBLIC LECTURE (at the Chelsea Physic Garden, Swan Walk, London, S.W.3), at 4 p.m.—Dr. J. Ramsbottom: "The Inter-relation of Man and Fungus in Health and Disease".*

ASSOCIATION OF SCIENTIFIC WORKERS (Birmingham Branch) (at the University, Birmingham), at 7 p.m.—Prof. J. D. Bernal, F.R.S.: "Science and Society".*

APPOINTMENTS VACANT

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

HEAD OF THE ELECTRICAL SECTION of the Engineering Department of the Oldham Municipal Technical College—The Director of Education, Education Offices, Oldham (June 20).

BOROUGH ELECTRICAL ENGINEER—The Town Clerk, Town Hall, Woolwich, London, S.E.18 (June 21).

LECTURER IN GENERAL SCIENCE including BIOLOGY and GARDENING—The Principal, St. John's Training College, York (June 23).

DEPUTY TOWN ENGINEER AND SURVEYOR—The Borough Engineer and Surveyor, Town Hall, Barking, Essex (June 24).

PRINCIPAL OF THE CAMBRIDGESHIRE TECHNICAL SCHOOL—The Education Secretary, Cambridgeshire Education Committee, Shire Hall, Cambridge (June 24).

LECTURER IN THE MECHANICAL AND CIVIL ENGINEERING DEPARTMENT—The Secretary, Technical College, Sunderland (June 28).

ASSISTANT TO THE ENGINEER-IN-CHIEF—The General Manager and Secretary, Mersey Docks and Harbour Board, Dock Office, Liverpool (June 30).

REPORTS AND OTHER PUBLICATIONS

(not included in the monthly Books Supplement)

Great Britain and Ireland

Memoirs of the Cotton Research Station, Trinidad. Series B: Physiology, No. 14: Concerning the Upward Movement of Soil Solutes, by T. G. Mason and E. Phillis; Studies on the Partition of Mineral Elements in the Cotton Plant, 2: Preliminary Observations on Potassium, Calcium and Magnesium, by E. Phillis and T. G. Mason; On the Expression of Sap by Low Pressure, by E. Phillis and T. G. Mason. Pp. 36. (London: Empire Cotton Growing Corporation.) 2s. 6d. [235]

Other Countries

United States Department of the Interior: Geological Survey. Bulletin 899-B: Geologic Structure and Occurrence of Gas in part of Southwestern New York. Part 2: Subsurface Structure in part of Southwestern New York and Mode of Occurrence of Gas in the Medina Group. By G. B. Richardson. Pp. iii+69-93+plates 5-8. 30 cents. Bulletin 922-J: Chromite Deposits in the Seiad Quadrangle, Siskiyou County, California. By G. A. Kynearson and C. T. Smith. (Strategic Minerals Investigations, 1940.) Pp. iv+281-306+plates 40-44. 30 cents. Bulletin 922-O: Chromite Deposits of the Pilliken Area, Eldorado County, California. By F. G. Wells, L. R. Page and H. L. James. (Strategic Minerals Investigations, 1940.) Pp. iv+417-460+plates 66-69. 35 cents. Bulletin 922-P: Chromite Deposits in the Sourdough Area, Curry County, Oregon. By F. G. Wells, L. R. Page and H. L. James. (Strategic Minerals Investigations, 1940.) Pp. iv+461-494+plates 70-71. 30 cents. (Washington, D.C.: Government Printing Office.) [205]

United States Department of the Interior: Geological Survey Professional Paper 196-A: Geology and Biology of North Atlantic Deep-Sea Cores between Newfoundland and Ireland. Summary of the Report; Foreword, by C. S. Piggott; General Introduction, by W. H. Bradley; Part 1: Lithology and Geologic Interpretations, by M. N. Bramlette and W. H. Bradley; Part 2: Foraminifera, by Joseph A. Cushman and Lloyd G. Henbest. Pp. xv+56+10 plates. (Washington, D.C.: Government Printing Office.) 30 cents. [205]

United States Department of Agriculture. Circular No. 594: The Use of Traps against the Japanese Beetle. By Walter E. Fleming, Emory D. Burgess and Warren W. Maines. Pp. 12. 5 cents. Miscellaneous Publication No. 417: Bark Beetles of the Genus *Hylastes* Erichson in North America. By M. W. Blackman. Pp. 28. Technical Bulletin No. 757: Parasites of the Birch Leaf-Mining Sawfly (*Phyllostoma nemorata*). By Phillip B. Dowden. Pp. 56. 10 cents. (Washington, D.C.: Government Printing Office.) [205]

Proceedings of the United States National Museum. Vol. 89, No. 3101: The Polyclad Flatworms of the Atlantic Coast of the United States and Canada. By Libbie H. Hyman. Pp. 449-496. Vol. 89, No. 3102: New Species of Heterocerous Moths in the United States National Museum. By William Schaus. Pp. 497-512. Vol. 89, No. 3105: Notes on Birds of the Guatemalan Highlands. By Alexander Wetmore. Pp. 523-582. (Washington, D.C.: Government Printing Office.) [205]

Nyasaland Protectorate. Annual Report of the Forestry Department for the Year ended 31st December 1940. Pp. 8. (Zomba: Government Printer.) 1s. [205]