

other adaptation and that this work requires detailed and expert study. The Publishers' Association has now recommended to its membership the establishment of a consortium of publishers familiar with the export fields concerned or otherwise interested in the low-priced book scheme, which would pool the experience and resources of the trade in Britain and, in co-operation with local trade interests overseas, might further assist the Government's programme.

Dr. Hill also stated that an encouraging increase in the flow of British publications into Yugoslavia has occurred since the agreement with the Yugoslav Government was announced on April 14, and that the text of an agreement with the Israeli Government, providing for imports up to £400,000 a year of British books, periodicals, newspapers and certain kinds of gramophone records, was laid before the House on October 25. The Government of Indonesia is considering British proposals for an agreement to facilitate the import of British publications, and steps have been taken to overcome the difficulty arising from the system of import control used in Chile, which has led to an unsatisfied demand there

for British books. The British Council has undertaken a considerable extension of its library services, and of the half-million books distributed by the Council in the past 18 months to its own libraries or other institutions all over the world, by far the greatest number have gone to Africa and Asia, especially to India, Pakistan and Ceylon. The range of learned periodicals covered by these libraries has also been greatly extended and many more presentations have been made to institutions such as medical schools.

In India and Pakistan, the Council's multiple holdings of widely used text-books has been very greatly increased, and in the past four months some 45 Indian universities and colleges have begun to use this scheme; the Council's services in these countries have also been improved by recruitment of a number of professional librarians to advise locally on the choice and direction of material and to organize the reference use of the libraries. Important presentations of books and periodicals have been made to colleges and other institutions in Nigeria, Ceylon, Burma, Viet Nam, Malaya and Indonesia.

THE POST OFFICE RESEARCH STATION

SOME of the scientific and engineering work of the Post Office Research Station at Dollis Hill, London, was shown during its open days, September 22-23. This Research Station serves the telephone and radio systems of the British Post Office, and also works on the mechanization of the postal service.

The Post Office (in collaboration with the National Physical Laboratory and the Royal Observatory) broadcasts signals of standard time-interval and frequency, having precisions of the order of ± 2 parts in 10^{10} . This has required the production of quartz crystals of great precision and stability, and the development of techniques for mounting them and maintaining them in oscillation at constant temperature. Further improvement in these time and frequency standards may require the use of caesium-beam resonators, one of which was shown working.

Transmission along wave-guides at frequencies such as 35,000 Mc./s. is a possible method of long-distance communication. The intended mode of transmission is H_{01} ; all others must be suppressed since they have different velocities of propagation. Suppression can be achieved either by using for the wave-guide a close-wound helix, so that its longitudinal resistance is high, or by internal coating of a solid guide with a dielectric other than air. The first of these methods is being investigated by other workers; the Post Office is studying the use of dielectric coatings.

Parametric amplifiers operate through the variation of the electrical magnitude of some component by means of a local source of power—the 'pump'. They are particularly useful at frequencies greater than about 200 Mc./s. A parametric amplifier was shown working, based on a variable-capacitance diode, and suitable for a tropospheric-scatter system working at about 900 Mc./s.; a similar amplifier, for 960 Mc./s., had been used to receive signals from the United States by way of the balloon satellite *Echo I*.

For some years the Post Office has specialized in work on metallic magnetic materials. Samples of silicon-iron were shown in which special crystalline textures had been produced by suitable rolling and heat treatment. Methods shown for work on magnetic properties included measurement of saturation flux by reversal of the specimen itself in a stationary field—a method suggested by Ewing and apparently overlooked since his time—and an apparatus displaying the variation of magnetization with direction in anisotropic material.

For many purposes the Post Office is introducing transistors into its apparatus, but, as its need for reliability is unusually strict, it is interested in the probable life of transistors and in the causes of their premature failure. One investigation of this kind has led to the detection of leakage through seals, even when the leakage-rate is of the order of 10^{-11} litre micron per second. Improvements in thermionic valves are still being pursued, however, and gains in both performance and reliability have been achieved: a valve suitable for submarine cable systems, having a conductance of 25 mA./V., yet operating at only 40-50 V. high tension, has been produced by winding both control grid and screen grid on a single former.

The chemical laboratories have produced a range of organic phosphors, intended for making code markings in postal sorting work. They are based on cyanuric-acid-formaldehyde condensation compounds, and offer a wide range of colours. They are easily handled and can be incorporated into printing inks and other such media.

The influence of high-speed computers as an aid to physical and engineering research was clearly in evidence. Although the Research Station has no computer of its own, it hires time on other computers and has its own staff who can prepare computer programmes.

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