

All three departments will contribute to the centre's fourth function of aiding fundamental education activities in its region. This aid will be carried out through missions by single experts or teams, the organization of conferences and study seminars and the exchange of information and documents—an important factor in this field where educators often work completely cut off from normal sources of information.

Since the purpose of these new regional centres is to train teachers and produce materials suitable for the particular requirements of each region, the operation has been decentralized to the greatest possible extent. In Paris, a co-ordinating body at Unesco House will supervise the activities of these centres. This body will also provide advanced training for students who show exceptional promise at regional centres.

The total cost of the programme, spread over twelve years, would be 20,000,000 dollars. A substantial part of the funds needed must be obtained from sources other than the normal budget of Unesco. It is believed that this can be achieved. This money cannot all come from the regions in which the centres will open, for they are areas in which little more can be done, for a long time, than to provide their populations with a hard-won living. Yet, obviously, it is in the interests of the entire world that its less-favoured regions should not be abandoned to illiteracy and disease, to poverty and recurrent famine and, worst of all, to despair.

In proposing its world plan, Unesco has more than a mere blueprint to offer. The first 'working model' of a regional centre is now in operation in Mexico, beginning the task of meeting the fundamental education needs of Latin America.

A full account of its working is set out in a recent Unesco pamphlet*. Although in its early days, the inspiration of Patzcuaro may well prove to be the beginning of a chain reaction culminating in the removal of one of the world's four great fears, the fear of ignorance.

* "Learn and Live." (Paris: Unesco, 19 Avenue Kléber, Paris; H.M.S.O., London.)

THE RADIO RESEARCH BOARD

REPORT FOR 1950

THE report of the Radio Research Board for the year 1950, together with the report of the director of radio research, Dr. R. L. Smith-Rose, has recently been published*. Four-fifths of the space is taken up by Dr. Smith-Rose's record of the year's activities, the nature of which may be gauged from the headings into which it is divided: propagation of radio waves along the ground; radio-wave propagation through the troposphere; the ionosphere and its characteristics; attenuation of radio waves in the ionosphere; forecasting of high-frequency radio propagation conditions; the ionosphere and low-frequency wave propagation; deviation of high-frequency radio waves transmitted by way of the ionosphere; research on materials of special interest for radio applications; investigation of fluctuation noise in valves and circuit elements; atmospheric noise; and measuring technique at very high radio frequencies.

* Report of the Radio Research Board, with the Report of the Director of Radio Research, for the Year 1950. Pp. 51. (London: H.M.S.O., 1951.) 1s. 9d. net.

This range of activities is so wide that it is difficult, and possibly invidious, to pick out particular topics for detailed comment. Perhaps the work of the Board as a whole can best be outlined by the following description, which is partly abstracted from the chairman's report. In the field of ionospheric research, in addition to the recordings made at the headquarters station at Slough, observations were collected from stations at Fraserburgh, the Falkland Islands and Singapore, and arrangements were being made to utilize recordings from Ibadan and Khartoum. Routine measurements were made of the height of reflexion as a function of frequency and of absorption occurring at vertical incidence; certain observations at oblique incidence were also made. All this information was used for the preparation of ionospheric forecasts. Further to this, the properties of the ionosphere at low frequencies have been examined, using signals from commercial transmitters at comparatively short distances.

Radio noise is of two kinds—atmospheric and that which is spontaneously generated in the circuit elements of the receiver itself; both phenomena have been actively investigated, and the first, because it involves the plotting of lightning flashes, has been of direct application to meteorology. Ground-wave propagation at low frequencies is of importance since it is the basis of several navigational aids, and equipment was being devised for the measurement of phase velocity. In the propagation of very short waves, recordings of radio field-strength under various conditions (particularly the distribution of the refractive index of the atmosphere), as they are affected by meteorological events, have been correlated statistically with the corresponding meteorological data. A radio-meteorological investigation, commonly known as the 'Canterbury Project', has been undertaken in co-operation with the New Zealand Department of Scientific and Industrial Research; it involves the measurement of transmissions of wave-lengths 3, 10, 60 and 300 cm. along a low-level duct about 100 m. high and up to 160 km. long which is made by the dry and warm (Föhn) wind blowing down from the southern Alps across the Canterbury Plains and out over the sea. Several results have been published and further analysis of the phenomenon was being continued.

Low-loss low-permittivity dielectrics, magnetic materials and semi-conductors have been investigated. In particular, the production of germanium free from arsenic has been studied in collaboration with the Chemical Research Laboratory, Teddington; the ultimate objective of the research is to provide information which will lead to the production of refined material suitable for making improved germanium diodes and triodes. In the work on very high frequencies (up to 3,000 Mc./s.) attention has been concentrated on the measurement of power, field-strength, impedance and dielectric properties and also on the development of centimetre-wave generators and the measurement of pulse parameters.

Finally, the abstracting service has been maintained during the year. This takes the form of abstracts and references prepared and edited by the radio research staff, some four thousand papers being noted annually. The work is published in the *Wireless Engineer* in Great Britain, and in the United States in the *Proceedings of the Institute of Radio Engineers* of America. This service is undoubtedly of great value to the radio profession all over the world.