

size of individuals. Fifteen new species are described, and there are thirty-one new records. From this work Holthuis concludes that present knowledge of the distribution of most Caridea ". . . does not allow any definite conclusions to be drawn from the available data, other than stating the close relationship with the European and East American faunas and the much less clear affinity to the Indo-West Pacific Caridea".

Quite similarly, Reid finds that the extensive collection of amphipods comprises a great many species originally described from the European seas and the Mediterranean. In fact, comparatively few southern forms were taken, suggesting a dominant influence of the prevailing south-going current system. Twenty-four new species have been proposed and the collection contains forty-eight species not previously known from tropical West African waters. There is also a section on the problem of intersexes in the Gammaridea, and an appendix giving a list of the West African Gammaridea and their distribution which will be welcomed by specialists in this difficult group.

In conclusion, it should be recorded that the imaginative and generous interest shown by Mr. Jarl not only made possible a resumption of oceanographical work immediately after the War, but was also a great stimulus to Danish marine biologists after several years of isolation. The results so far published amply bear out the latter, and it is to be hoped that further *Atlantide* Reports will soon be ready. The publication of this well-produced series is being made possible by grants from Mr. Jarl and the British Museum (Natural History).

N. B. MARSHALL

## FUNDAMENTAL EDUCATION

SINCE its foundation, Unesco has considered the problems arising out of illiteracy to be its major challenge and has developed programmes of "fundamental education" to help the 1,200,000,000 men and women in the world who can neither read nor write.

The main purpose of fundamental education is to help people understand their immediate problems and to give them the skills to solve them through their own efforts. It is an emergency solution designed to help masses of illiterate adults and children in countries the educational facilities of which have been inadequate.

Until 1950, Unesco's fundamental education work, because of a limited budget, was experimental. The experiments, however, repeatedly produced the same conclusions, no matter where they were conducted. Fundamental education cannot hope to achieve tangible results without men and materials, that is, without qualified workers and effective educational materials specifically designed for its task.

Neither, at present, is available. The demand for primers in Creole or agricultural manuals in Sesuto is not great enough to attract private capital to the long job of research required to produce them. Teacher-training schools ordinarily do not require their graduates to be able to teach reading in one class and contour farming in the next.

If each individual country were to attempt this job, the overall cost would be enormous, and an inevitable waste of money and man-power would

result. The experiments showed that a pooling of resources at regional levels is needed.

Unesco has now put forward a plan to aid its member States by helping to train fundamental education workers and by developing samples of the teaching materials they need. This plan is intended to operate as a twelve-year programme in which a world network of six production and training centres will be established in five regions, namely, Latin America, Equatorial Africa, the Middle East, India and the Far East (where two centres will be set up). The plan was approved by the unanimous vote of the sixty-four member States of Unesco at the sixth session of the Unesco General Conference, which met in Paris during June-July 1951.

The goal of this programme is to train some five thousand fundamental education specialists. These graduates, in turn, will staff similar training centres organized on national and local lines. It is these latter centres which will train the teachers who will work in the field.

Under Unesco's plan, each centre will be equipped to handle yearly two classes of a hundred students each. These students will be selected by their Governments and sent to the centre in their region not as individuals but as teams. A typical team studying at a centre might include an adult educator, a sanitary engineer, a nurse, a rural school teacher and an agricultural expert.

Some of the students at the centre will have been already trained in their own specialities under the guidance of three other United Nations agencies the Food and Agriculture Organization, the International Labour Organization and the World Health Organization. They will come to the Unesco centres to learn how to put their technical knowledge to work in underdeveloped regions through fundamental education techniques.

The course of study planned for these students will cover twenty-one months. At first, there will be an intensive nine-month training period and then, after a one-month vacation, two months of "on-the-job training" at institutions conducting fundamental education work. The course will conclude with five months of practical field-work as teams in the vicinity of the centres, one month of vacation and a three-month refresher course at the centre.

A typical centre in operation will be organized to perform a four-fold task; namely, research, production of educational materials, teacher training, and aid to fundamental education activities in its region.

These functions will be carried out by three departments. The first, in charge of research, will determine the specific needs of the region in which the centre operates and the methods required to meet them. The second, or production department, will be responsible for developing sample text-books, films, film-strips, wall-charts and other materials needed in fundamental education. One of the five centres will be equipped with a complete production crew to turn out films and other visual materials. Another will be similarly staffed for radio work, with an experimental recording studio included in its equipment.

The teaching faculty of the centre will comprise the third or training department. Staff will be made up of instructors in sanitation, hygiene, agriculture, handicraft industries, home economics and literacy training, as well as general fundamental education specialists.

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.