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Organisation of Radio Research in India

IT is a well-established axiom to-day that progress in all branches of scientific knowledge can only be maintained by the conduct of intensive fundamental research, as well as by the continued developments in the application of the particular field of science under consideration. In many fields this type of research can be carried out within the confines of the ordinary scientific laboratory. Research into the fundamental problems of radio communication, however, can scarcely be limited in this way, since many of the investigations require to be conducted in a laboratory of world-wide dimensions, and considerable resources and much co-operation are necessary in order to stage the experimental work on an adequate basis. Such considerations as these have led to the establishment of national radio research boards, the first of which was formed in Great Britain in 1920, while others have followed in Australia and Canada. The time would now appear to be very opportune for considering the establishment of a similar Radio Research Board in India, where fundamental research in radio communication has so far been limited to the activities of quite small bands of workers in different universities, notably those under Prof. S. K. Mitra at Calcutta and under Prof. M. N. Saha at Allahabad.

To those interested in the general progress of radio communication, whether from a scientific or commercial point of view, there would appear to be a strong case for the establishment of such a research organisation. The tropical climatic conditions of India are likely to have a considerable influence upon the production, propagation and reception of the electric waves used in radio communication, and the effects to be expected are

not easily predictable from the knowledge that has been gained from research conducted under the more equable conditions of Great Britain. The phenomena of the propagation of waves along the ground and through the atmosphere can only be investigated adequately on the spot, while the proximity of India to the seat of intense atmospheric disturbances will have a considerable influence on wireless reception.

Many of these problems are of interest for their own sake; they will most certainly be of great interest to those who have already gained considerable knowledge from similar work under other radio research organisations; but in addition to this, the knowledge gained from the successful attack on these problems will be of the greatest importance to those responsible for the development of radio communication in India, for broadcasting and other purposes. In some ways, the development of radio stations for ordinary telegraphic and telephonic purposes in India has been carried to a moderately satisfactory stage, largely due to the very active assistance rendered by the appropriate administrations in Great Britain. Even in this sphere, however, it must not be considered that progress and development are by any means complete.

It is in the field of broadcasting, however, that noteworthy developments appear to be likely. The population of India is in the order of 350 millions, of whom it is estimated that only about 12,000 are registered broadcast listeners. With the full realisation that a large proportion of broadcast listening among the masses is likely to be on a communal basis, it is perhaps not an overestimate to suggest that the number of potential

purchasers of broadcast receivers is of the order of three and a half millions. There is an attractive market to the manufacturer of receivers, which must naturally be adapted to the conditions, climatic and other, under which they would be required to function in India.

Before consideration can usefully be given to this aspect, however, it is necessary that a radio broadcasting service shall be provided in India on an adequate scale, and Mr. K. Sreenivasan, of the Indian Institute of Science, Bangalore, has already described in some detail the type of organisation which is required for this purpose (see *NATURE*, Aug. 10, 1935, p. 231). Such a broadcasting organisation would derive considerable benefit from the establishment of a Radio Research Board, with which it could co-operate in the conduct of many of the fundamental problems underlying its technical service. Indeed, in so far as the British Broadcasting Corporation is already providing a part of its Empire service for English-speaking residents in India, a local organisation which could investigate and give advice upon the problems of reception in India would most certainly be welcomed by the broadcasting authorities in Great Britain.

The benefits to be derived from a new organisation of the type under discussion are most clearly appreciated from a brief review of the work of those radio research boards already in operation.

In Great Britain, the Radio Research Board was established in 1920 under the Department of Scientific and Industrial Research. It comprises representatives of all Government departments interested in radio communication, namely, the defence services, the Post Office and the British Broadcasting Corporation, and in addition, there are one or two university members who have attained high standing in radio research. The research work is conducted largely at the National Physical Laboratory, but in part also at universities under the general supervision of a number of technical committees appointed by the Board. The programme of research for the most part may be classified under the headings of propagation of electric waves, directional wireless, atmospheric disturbances and the development of apparatus and technique for standardisation and measurement.

Much of the work of the Radio Research Board involves resources which are quite beyond those of any university or even of any com-

mercial organisation or self-contained Government department engaged upon a specific aspect of communication. The Radio Research Board combines the advantages for its staff of freedom from the continued stress of direct commercial application of the results of their work, with the co-operation which is obtainable from those who utilise radio communication in one or more of its many aspects. This co-operation is readily provided because the user administrations realise that the results of the research will frequently be of direct benefit to them in their own work. Further, the operation of such a research board provides a team of trained experts, whose advice and experience is readily available in connexion with the many problems arising in the progress of radio communication. In some cases the organisation has been regarded as a source of trained personnel for industry.

The Australian Radio Research Board began in 1926, with all the benefits of the experience of the British organisation, and indeed, many members of its staff were trained under the British Radio Research Board. Canada entered the field in 1930 with a committee appointed under its National Research Council.

While these research organisations overseas deal with particular radio problems which are local to their countries, they also conduct programmes of research which are very similar to that mentioned above in progress in Great Britain. This is the result of what is considered to be an important feature of the British Board, in that it recognises the Imperial aspect of the problems with which it has to deal; it is thus always ready to co-operate fully with the Boards of the Dominions Overseas, not only by suggesting a common and suitable programme of work, but also by giving freely of the advice and experience of its staff, and even in some special cases by the supply of necessary apparatus.

It is surely time that India was able to take its place in such a world-wide scheme, and it is to be hoped that those in a position to do so will foster the inauguration of a suitable Radio Research Board and provide the necessary funds to initiate its work. The research already carried out in India indicates that the universities are ready to provide a programme of problems of a fundamental nature, and even the nucleus of a staff of trained personnel, keen and enthusiastic to continue their investigations, which are at present being limited through lack of resources.