

POST-WAR PLANNING IN RADIO TELECOMMUNICATION

THE meeting of the Wireless Section of the Institution of Electrical Engineers on May 6 was devoted to a discussion on "Post-War Planning in Radio Telecommunication", which was opened by Sir Stanley Angwin, engineer-in-chief of the Post Office, and a member of the committee of the Institution studying the possibilities of post-war planning in electrical engineering in general. While it is true to remark that all possible efforts on the part of radio engineers and physicists should be devoted to ensuring that the present conflict will lead to a victorious issue for the Allies, it is equally wise to observe that those with experience and responsibility should divert a little of their time to the consideration of the problems which will most certainly arise at the termination of the War.

Sir Stanley's opening remarks were concerned chiefly with the probable developments in post-war telecommunications—line, cable and radio—for conducting the normal peace-time business of the world, while, in addition, he outlined the probable future of broadcasting, television and the application of radio technique to various spheres, in particular, navigation. It is already clear that radio telegraphy and telephony on one hand, and the submarine cable and land line on the other, are complementary services, and their respective applications are decided by matters of distance and geography, as well as by technical considerations. In both this field and the similarly extensive field of broadcasting, it will be necessary after the War to resume consideration, on a world-wide basis, of the equitable division of radio frequency channels among the various services requiring them. The putting into effect of the most recent plan for the distribution of the frequencies or wave-lengths of European broadcasting stations, was interrupted by the outbreak of war; but in any event a considerable revision of this plan will probably be necessary on a return to normal conditions.

The design and development of broadcasting transmitters and receivers will need to be reviewed in the light of advances of technique and knowledge, and a certain amount of standardization may become necessary. In the field of television the technique of the service, and in particular the mode of presentation of the picture in the receiver, must be reviewed in some detail. With the view of relieving the radio channels of all unnecessary traffic, it is likely that more serious attention will be required to the scope offered by the use of land-lines for the distribution and relaying of broadcasting and television programmes. Finally, Sir Stanley Angwin referred to the problems which will have to be faced in connexion with the return to industry of staffs at present in the Services or in Government establishments. The radio and telecommunications industry will also have to deal with the technical matters connected with the reopening of overseas markets, if we are to take a proper position in world trade.

In continuation of the discussion, Dr. R. L. Smith-Rose referred to various problems likely to be encountered in connexion with fundamental research and development, the technical standardization of equipment and components, the re-allocation of personnel at present engaged on radio work, to the recognition of the radio-physicist as well as the properly qualified radio electrical engineer, and finally to the matter of post-war publication.

In the field of research, it will be found that while the radio wave spectrum has been considerably extended during the War, much of the ground will have been hurriedly and only very superficially explored, and there will remain a good deal of work in the examination and consolidation of principles and technique before it will be possible to make the best use of the frequency bands then available. It will probably be found necessary to extend the range of research, both fundamental and applied, in order to find room and allocations for the greatly increased number of services which will be awaiting application. In connexion with this matter, it will be necessary to give renewed attention to the technical merits of wired broadcasting, single side-band transmission, and the possibilities of the very short wave bands for relays and short-distance radio links. With the extended use of the very short wave-lengths, the subject of interference and its suppression will be brought into the limelight again, particularly as many of the purposes to which radio technique has been applied during the War are not conducive to freedom from interference.

If the radio industry is to develop satisfactorily on an extended basis at the end of hostilities, it is likely that a considerable amount of standardization of valves, components and equipment will be necessary, while there will be ample work for those whose duties include the preparation of specifications and test schedules. In the latter connexion, it will be desirable at a very early stage to lay down a statement or code of safety precautions to be followed in dealing with the very high voltages found nowadays in radio receivers and cathode ray tube apparatus. During present conditions much of this gear has been produced hurriedly, and without the precautions which have hitherto been considered essential by the fully trained and experienced electrical engineer.

With regard to the question of personnel and staffs, Dr. Smith-Rose believes that while many at present attracted to radio work in the various Services will return to their different peace-time occupations, many—especially the younger members—will attempt to stay to make a career in some branch of the radio industry. This influx of personnel will present a problem for the Institution of Electrical Engineers itself to deal with, for while many of these radio workers will possess adequate academic qualifications in science, and some practical experience, they can scarcely be classed as fully qualified electrical engineers according to the Institution's standards. Furthermore, many of those who return to their normal occupations in science, art or business are likely to wish to retain an interest in radio as a hobby, and the Post Office authorities might well be thinking over their future attitude towards the post-war radio amateur. The universities will also have to recognize a continuous need for properly educated recruits to a stable and growing profession, and it will be clearly desirable that a well-arranged graduate course in communication engineering should rank on an equal footing in the future with electrical engineering.

Another matter that may well receive consideration in advance by institutions and societies, as well as by the technical periodical Press, concerns the method of handling the vast volume of publications that will suddenly become available when the existing barriers of secrecy are removed. Indeed the quantity of radio literature that will pour out under post-war

conditions may demand a considerable extension in our present methods of systematic arrangement, abstracting and indexing. In this connexion, two useful suggestions were made later in the discussion, by Mr. D. A. Bell and Dr. L. E. C. Hughes. The first was to the effect that it would prove very desirable to institute some kind of critical reports of progress in the various phases of radio technique, perhaps on the lines of the series of annual reports already issued by the Physical Society; while the second directed attention to the desirability, if not of the necessity, of using micro-film technique for the recording of published papers.

Messrs. V. Z. de Ferranti and C. E. Strong outlined the difficulties which are likely to confront a radio industry suddenly called upon to make a change-over from the carrying out of war contracts to Service specifications, to the re-establishment of a peace-time industry on a stable basis. It is clear that the present radio industry has not been planned on a sufficiently large scale, and it was suggested that this experience should be borne in mind in the future. At the termination of the present War, it is probable that the whole radio industry will require an interval in its production programme while the design and development of the new peace-time equipment is carried out. Some considerable foresight will be needed here to retain groups of staff and workers intact over a comparatively slack period before the industrial machine gets into its new stride.

Mr. J. A. Smale said that he anticipated many developments in the field of point-to-point radio telegraphic communications, including the use of printing telegraphs and coded messages. To a large extent the standards of transmission have been relaxed during the War, and it will be necessary to recover these if all the available channels are to be used in the most efficient manner. Mr. A. D. Blumlein expressed the somewhat comforting opinion that the methods of distributing television programmes used in 1939 were about right, and, apart from minor improvements, would need only slight revision to resume broadcast operation.

The probable directions in which the broadcast receiver industry is likely to resume activities were examined in some detail by Dr. R. C. G. Williams, who believes there is the possibility of some Government control of the industry as an outcome of a reconsideration of the political side of broadcasting. Both he and other speakers envisage the possibility of the use of an improved projection type of cathode ray tube for obtaining better picture reproduction in domestic receiving equipment.

After further contributions by other speakers, the discussion was brought to a close by Mr. H. Bishop, chairman of the Wireless Section of the Institution. It is desirable, he said, to plan a bold policy of expansion in the whole field of telecommunications, and this will of necessity involve dealing on a national basis with all the problems which have been brought forward, and particularly those of staff, education, and research and development. He referred to the difference in standards in television in the United States and in Great Britain, and agreed that our own system could quickly be ready for the resumption of a satisfactory public service. He also referred to the desirability of encouraging increased co-ordination in the field of post-war research, and expressed the hope that many secret devices developed under war conditions will be released for a peace-time application in due course for commercial purposes.

THE FUTURE OF TECHNICAL EDUCATION*

By H. J. CULL

IN common with all sections of the community, technical teachers find the progress of the War marked by increasing demands upon them. Apart from special courses, the average experience appears to be of a large increase in the part-time day classes of the colleges and the maintenance of evening or the substituted week-end classes at something approaching their normal level. To cater for these with, in many cases, depleted staffs has called for sacrifices of many of our cherished ideas as to conditions of service—changes in hours of duty per week, sizes of classes and suitability of accommodation for classes—which will demand the watchful care of the Association if they are to be regarded as temporary expedients and not precedents.

Education and the Future

Prominent in our thoughts in spite of many pre-occupations is the discussion which has been in progress during the year on educational post-war reconstruction. Inspired in the first place by an official invitation by the Board of Education, the executive of the Association of Teachers in Technical Institutions, as well as similar groups within other major educational associations, has given consideration to this matter. Official pronouncements by succeeding presidents of the Board of Education, as well as provisions already on the statute book awaiting the announcement of "appointed dates" and also the war-time developments of activities among young people, make certain steps in reconstruction almost self-evident. It would appear, for example, that after the age of eleven plus, all schools should be secondary in character, equal in status, and administered by one department of the Board of Education. The main interest here of the Association is to secure the continuance as individual entities of those schools which have so fully justified themselves during recent years, namely, the junior technical schools. These schools, giving a broad general education; with a scientific approach to an industry as a whole; working in close association with the industry of the district; and provided with the equipment and the qualified staff to give the industrial bias, have achieved a success which cannot be questioned. The one handicap which has always been present and has had to be overcome has been the suggestion of inferiority due to the later age of entry when compared with other types of schools. If this be removed by the general reconstruction, we have no fear that the schools will produce youths who will be other than a credit to themselves and any society in which they are partners. Pioneers in this type of school are convinced of their value from the point of view of the student—not alone of the industry which they join. The realistic approach to the studies means much to certain types of young people, and that is the real justification for wanting to preserve the schools and extend the experiment.

We are watching a development of adolescent education in two distinct directions at the moment. Firms are releasing for part-time day education employees in larger numbers than ever before.

* Substance of the presidential address delivered before the Association of Teachers in Technical Institutions on May 23.