

BROADCASTING NEW HORIZONS FOR ENGINEERS AND SCIENTISTS

by

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Educational broadcasting was initially confined to schools but is now being widened to encompass adult audiences. In the past many evening programmes have also been of educational interest but plans are now under discussion for further developments in this direction and for the transmission of such programmes outside the usual evening hours. More scientific programmes are planned for BBC-1, BBC-2 and sound broadcasting.

All this offers many fields for the scientist and the engineer, either as direct participants in the programmes, or as advisers in the production of such programmes, or in the development of the facilities necessary to carry out the programme.

As artists, scientists and engineers are contracted to take part in broadcasts, which in general can be divided into school broadcasting and further education. The staff appointed to educational broadcasting in the BBC include twelve scientists and engineers who are employed as producers, script writers, programme assistants, etc. The anticipated growth of educational programmes in the next few years will lead to an increase in the number of scientists and engineers regularly employed in this way, in addition to those contracted as artists—which is of course on a “per occasion” or “per series” basis.

The openings for qualified staff to participate directly in the programme will be fairly limited in number although they will offer very interesting scope for the individual in presenting scientific information in a way that will be clear to the audience but not scientifically distorted. Such people will be required from very wide fields of interest and in general will of course tend to be specialists in their own subjects.

There are however many more opportunities connected with the development of the technical side of a broadcasting service as this affects both the operation of the existing facilities and services and, more interesting to the scientist, the development of new systems. All this work extends over a wide range, and many scientists and engineers derive more satisfaction from carrying out a piece of research work, taking a development or a project to completion, than they would from participating in programmes. The activities involved in broadcasting include acoustics, optics, radiation, solid-state physics, aerial construction, power generation, telecommunications, mathematical studies, and so on. In fact, broadcasting uses facilities over a wider field than almost any other activity, and there are openings for the mathematician, physicist, mechanical engineer, civil engineer as well as the more immediately apparent electrical and electronics engineer.

This is particularly so at the present time when the BBC is engaged in the development of its second programme on UHF and when the introduction of colour is imminent. Graduate staff are employed in the development of all these facilities and to a somewhat lesser extent in the exploita-

tion of them. For the physicist, work is being carried out on the basic requirements for colour fidelity in a colour transmission system, in the design and appraisal of lenses to give adequate picture quality, on colour analysis systems, on the characteristics of delay lines—which have been and will be used for many applications in broadcasting—on a wide range of acoustic problems and on basic examination of aerial radiation problems, waveguide systems, shortwave systems, etc. For the mathematician, there are problems in probability, in advising engineers on mathematical solutions to their problems over the whole range of broadcasting, particularly in radiation and computer problems. For the electronics engineer, work includes design and use of equipment for research into propagation problems in all fields from low frequencies up to 10,000 Mc/s, and presumably in the future even higher frequencies, the design of transmitting equipment up to the highest power in use anywhere, the design of all forms of television equipment, and the basic requirements of television systems in black-and-white and colour. For the power engineer, there are complex power problems in units which, although not as large as those in industry, can take powers of thousands of kilowatts from the network. For the telecommunications engineer there are problems of line communication in all frequency ranges from audio to the higher carrier frequencies, including the very specific problems of television. Broadcasting has put television pictures on to telephone cables and on to transatlantic cables and has co-operated with the General Post Office in sending black-and-white and colour television pictures over satellites to the U.S.A. As in so many fields at the present time, computers are having a large impact on broadcasting practice. They have been used for many years in the solution of complex problems in line transmission, filter design, aerial computation and the like, but they are now being used and will increasingly be used over wider aspects of broadcasting.

Our programme of work in the United Kingdom at the present time is very extensive. To ensure the distribution of BBC-2 in black-and-white over the whole country, because of the high frequencies to be used, requires some three or four times as many stations on UHF to give coverage equivalent to that on VHF. All the stations will be capable of taking colour transmission whatever is the system finally chosen. Evaluation of the merits of the various proposals for colour extends over the whole field of broadcasting including as most important, the performance and cost of the receivers in the hands of the public. This work on colour television system evaluation is carried out by the broadcasting organisations in this country and in Europe in close collaboration with the radio receiver industry and the Administrations of the countries concerned.

All the other activities mentioned are carried out in the United Kingdom but of course parallel activities exist in other countries. Engineers and scientists from the U.K. go to many countries and take part in broadcasting in one form or another while the BBC actually operates a number of relay transmitters located abroad. Arrangements exist whereby graduates who have joined in one activity can transfer to others and in so doing widen their experience or take up work of whose existence they were perhaps unaware at the time they graduated.

Broadcasting can therefore offer to the science graduate a career which will be active and satisfying and one in which the future offers continuous and active development.

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