

Fifthly, the local education authorities must make arrangements for the repair and servicing both of films and of apparatus.

Sixthly, but by no means least important, the teaching profession must be shown how to handle the medium. Up to the present the filmstrip and the film have been used mainly by enthusiasts. All teachers whose lessons can be improved by the use of visual aids should be trained to use them. It is therefore incumbent on all local education authorities to provide teachers with the facilities for acquiring that ability.

Lastly, a great deal more information based upon careful research is needed before educationists can regard themselves as masters of this medium. Scotland has produced two valuable reports which contain important statements about the subjects on which films should be made, the length of film suitable for children of various ages, and the value of sound films. These conclusions and others formulated in the 1947 Progress Report of the National Committee for Visual Aids in Education need testing. It is perhaps most important of all to ascertain the value of the film in teaching children of differing grades of intelligence and of its use in the teaching of adults.

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81c

## SUMMER SCHOOL IN ELECTRICAL ENGINEERING AT RUGBY

**D**URING July 12-16, 1948, the British Thomson-Houston Co., Ltd., held, at its Rugby works, a summer school in electrical engineering, which was attended by members of the staffs of the electrical engineering departments of universities and technical colleges, together with representatives of the Service colleges, the Ministry of Education, the Institution of Electrical Engineers, and Government research organisations. In the "Proceedings" of the school, published recently by the Company, are recorded the scientific papers presented by members of the Company's staff.

These papers give an interesting cross-section of the activities of a large electrical manufacturing organisation. Materials, for example, are represented by two papers, one on magnetic sheet-steel and the other on modern developments in electrical insulators. A review is given of some of the mechanical problems affecting the design of electrical machines. Several papers deal with design problems of the magnetic and electric circuits of rotating electrical machinery and one with the design of insulation for high-voltage transformers. Power systems receive attention in papers on switchgear, protective gear and power system analysis. Rather more than half the papers are concerned with electronics or high-frequency phenomena and applications. The fundamental theory of communication forms the subject of one paper, and magnetron generators, pulse modulators and micro-wave transmission techniques are covered by a group of papers. In the field of electronics there are contributions dealing with fluorescent discharge-lamps, arc control in gas-filled valves, the application of the mass spectrometer to leak detection in high-vacuum systems, and a development of the betatron.

One of the most valuable features of this collection of papers is the indication given in many of them of the trend of development and of the directions in

which research in university departments could contribute towards the solution of some of the more fundamental problems. Having regard to the fact that these lectures were prepared by members of design and development departments as well as of the research department, it is perhaps worth while to record the impression that the scientific requirements of design and development are scarcely less stringent than those of research. Of particular interest is the opening address given by Sir John Cockcroft, in which the needs of Great Britain for scientific and technical staff are reviewed.

## THE AGORA OF ANCIENT ATHENS: A STUDY IN ARCHÆOLOGICAL RECONSTRUCTION\*

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**T**HE excavations which are being currently conducted by the American School of Classical Studies in the Agora, or civic centre of ancient Athens, have led to the identification and restoration of many ancient buildings through the combination of evidence drawn from ancient authors, inscriptions and the exploration itself. As a specimen to illustrate the procedure, the Odeum, or Concert Hall, may be selected.

The remains of the Odeum have been identified from a reference in Pausanias, the 'Baedeker' of the second century. Its date of construction is fixed in the Augustan period, partly by its architectural style, partly by the pottery associated with its foundations and partly by its specific name, the Agrippæum, which suggests that the building was erected by Agrippa, the minister of Augustus.

A close study of the foundations of the building and of scattered marble blocks from its superstructure has permitted the recovery of its architectural scheme in all essentials. The building proves to be unique in its dual nature, comprising as it did a core, in which were an auditorium, stage, dressing-room and lobby, and around the core a raised balcony that opened outward for the accommodation of spectators who might wish to view processions or ceremonies in progress outside the building. Of particular interest among the architectural details of the original period is the stage front, which was decorated with a marble screen supported by terminal figures alternately male and female.

The siting of the building on the axis of the Agora square is reminiscent of the contemporary Forum of Augustus in Rome, while its scheme of lighting through an open colonnade at one end was inspired by the Erechtheum; hence its design may be the work of a team of architects, some Greek and some Roman.

The building collapsed and was afterwards remodelled (as shown by stamped roof tiles) about A.D. 150. The remodelling involved reduction in the capacity of the auditorium from 1,000 to 500, and in the conversion of the original dressing-room into

\* Abstract of a Friday Evening Discourse delivered at the Royal Institution on February 18.