

Three kits are at present available, for single-beam and double-beam oscilloscopes and for a valve voltmeter.

Several counting and scaling units were shown—one which provided some relatively light relief was arranged to measure one's reaction time. The victim was required to press a button when some miniature traffic lights turned red. The time taken in microseconds was duly counted and displayed; it was usually of the order of 2×10^6 .

The research section showed a change from previous years in that there were no university exhibits, but three by national organizations: the Admiralty, Atomic Energy Research Establishment, Capenhurst, and the British Railways Research Department. The last-named was showing a train control system which automatically applies the brakes of a train passing a signal at danger. The Hall effect in an indium antimonide probe attached to the train is used for detecting the energization of an electromagnet between the tracks. This equipment, which is still in the experimental stage, is intended as an all-electronic successor to the electro-mechanical system now going into service.

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ENGINEERING TRAINING IN THE BRITISH BROADCASTING CORPORATION

THE series of B.B.C. Engineering Monographs, to which reference has already been made in *Nature* (177, 519; 1956), provide a continuous description of the technical equipment and operation of the Corporation, developed and applied to the conduct of its duties as a public broadcasting authority. Among these duties is that of recruiting and training the large numbers of engineers and technical personnel required by the organization.

B.B.C. Engineering Monograph No. 11* is entitled "Engineering Training in the B.B.C.", by Dr. K. R. Sturley, and this describes the work of the training department which came into existence about eleven years ago, and is established at Wood Norton Hall, Evesham. Here there is accommodation for up to two hundred residential students, and full teaching facilities during various courses of instruction, which vary in length from one or two up to twelve weeks. The aims of the training department are to develop the skill and capabilities of staff, to encourage them to adopt a constructive attitude to new ideas and to increase the efficiency of the individual to the mutual benefit of himself and of the organization to which he belongs. Every attempt is made to avoid duplicating the basic training in electrical engineering which is provided by universities and technical colleges; the department concentrates on the application of basic principles to the equipment and methods used in broadcasting.

Some of the courses provide training for newly recruited entrants to the operating and technical assistant staffs, where the instruction varies from the arrangement of studio lighting to the maintenance of high-power transmitters. More advanced courses are intended to provide junior staff with opportunities for promotion in the operations or maintenance

* B.B.C. Engineering Monograph No. 11: Engineering Training in the B.B.C. By Dr. K. R. Sturley. Pp. 24. (London: British Broadcasting Corporation, 1957.) 5s.

fields. Students with the appropriate national technical qualification may be exempt from the first part of this course; they are then required to take the second part, dealing with broadcasting equipment and technique which cannot be a part of the syllabus leading to an academic award. At a more advanced level there is a graduate apprentice course of two years duration, involving attachment to other departments of the B.B.C. as well as the training department. Its purpose is to produce a well-balanced man of wide experience, who will eventually qualify for corporate membership of his appropriate professional institution. Two types of graduates are sought here: one intended for specialist departments such as those conducting research or design and development; the other is intended to fill a senior position in the operation and maintenance branch, where the ability to supervise staff and to deal coolly and efficiently with an emergency are essential qualities.

Under Dr. Sturley as head of the Training Department, the instruction is organized in four sections dealing with fundamentals, radio-frequency transmission, studio and recording techniques, and operations; a fully qualified staff of lecturers, demonstrators and laboratory assistants is provided. A separate section of staff is responsible for the production of training manuals, and also of booklets on such subjects as television lighting, frequency modulation and slot aerials, which are of great value to the technical staff of the Corporation.

During July 22–26 last, a summer school was held at Wood Norton and was attended by some thirty members of the staffs from the engineering and physics departments of universities and technical colleges in the United Kingdom. In addition to inspecting the Training Department and witnessing demonstrations in the laboratories, a series of lectures was given by members of various departments of the B.B.C., the subjects ranging from training, research and operation to the presentation of science in sound and television broadcasting. The programme naturally included talks on the engineering and technical requirements of the B.B.C. staffs, and there was ample opportunity for both formal and informal discussion between the visitors and the resident staff. This short and very successful summer school, which was a repetition on an expanded scale of one held in 1952, should do much to strengthen the ties between the Corporation and the colleges on which it must rely for its recruits.

TRAINING OF FACTORY WORKERS

THE effectiveness of the training of factory workers has an important bearing on industrial productivity. Developments of production methods in this century, particularly in some of the newer industries, have made it possible to employ large proportions of semi-skilled and unskilled workers in the factories; the training of this kind of operative has been relatively neglected until recent years, presumably on the assumption that, because his work was simple in comparison with that of the craftsman, he would be able to learn it with a minimum of assistance.

That this is an unwise policy to follow has been demonstrated by the experience of firms which have set about the training of semi-skilled and unskilled workers in a systematic fashion, endeavouring to teach them the knowledge and the skills they have to acquire in order to carry out their work effectively. In order to encourage industry to recognize the importance of the subject and to help managers with information on the training of operatives, the European Productivity Agency sponsored a survey in seven European countries. The aim of the survey was to study current practice in the systematic training of operatives within the factory itself.

The organization responsible for the survey in Britain was the National Institute of Industrial Psychology, which was also made responsible for co-ordinating the whole inquiry and preparing a report*.

The survey made it abundantly clear that, as yet, industry in general has done very little to provide training for semi-skilled and unskilled workers on a systematic basis. The situation differs from industry to industry; it was easier to find examples of systematic training in the textile and clothing industries, in the electrical and transport equipment industries and in the chemical industry than in others.

The fact that systematic training is so little developed reflects the attitude of managers to the question of training for the kind of work with which the inquiry dealt. This attitude seems to stem from a number of ideas, to four of which reference was most frequently made.

The first was that semi-skilled and unskilled jobs were so simple that they could easily be learned without any training. Secondly, there was the fear that workers who were trained would be enticed away to other firms, perhaps at higher wages. An associated idea was that, because the rate of labour turnover was high, it was not worth while attempting to improve the training of the new workers. Lastly, there was the notion that systematic training is necessarily elaborate and expensive. This stems from the lack of information on training methods and their applicability to different kinds of situation, with their relative advantages and disadvantages.

There were, however, some managers who considered that they had a social responsibility for ensuring that their employees were helped to acquire the knowledge and the skills needed for the successful execution of their work. Some took a still wider view of their responsibilities: it was not, they felt, enough for industry to help the individual to develop his professional skill; it should provide him with opportunities and assistance for developing general knowledge and character qualities which would help him to lead a fuller and more satisfying life.

Although no evaluation of training schemes was possible because firms were not in a position to provide the evidence on which such an evaluation could be based, it was the almost unanimous opinion that the results were beneficial.

The survey also demonstrated the general applicability of systematic training methods in factories. Not only were the learners of all ages, but also the range of unskilled and semi-skilled jobs for which training was being given was a very wide one, from tasks as simple as machine feeding or packing articles in

boxes to others like weaving and loom maintenance, where both the knowledge and the skill involved can be extensive.

In all countries the investigators reported a tendency for training schemes to be weaker on the side of instructional method than on that of organization. In many cases those who gave the instruction to the novices had not themselves received any training in the art of instruction. Although success in instruction is largely dependent on the personality of the instructor and his interest in the job, skill in instruction can be developed by formal training, and an increase in facilities for such training will be required in all the countries concerned as the systematization of training of semi-skilled workers is extended in industry.

COLONIAL TERRITORIES

REPORT FOR 1956-57

THE report on the Colonial territories for 1956-57* follows the pattern of previous years, providing the conspectus of political, economic, financial and social developments in these territories against which the achievements to be recorded in greater detail in "Colonial Research, 1956-57" are to be considered. Some of this material, outlined in the chapter entitled "Research and Surveys", has also appeared in reports from various Colonial research organizations already noted in *Nature*, and for this reason, although this chapter of the present report is that of most direct interest to the scientist, consideration of research in the Colonial territories will be deferred until the fuller report on "Colonial Research, 1956-57" is published in due course.

Recruitment to the Overseas Civil Service was maintained generally at the level of previous years. Almost the same number of electrical and mechanical engineers were recruited as in 1955, and recruitment of civil engineers improved; that of agricultural officers fell. Demand remained high for all these appointments, and there was little change in the number of unfilled vacancies. Those in the service of Colonial governments who received training in the United Kingdom reached a record number of 2,752, compared with 2,190 in 1955 and 2,081 in 1954.

Outputs of most products rose in 1956 and it is estimated that the gross domestic product at market prices in the Colonial territories was some 4 per cent higher than in 1955. Increases in cocoa production in both the Gold Coast and Nigeria largely compensated for the lower prices. In 1956 roughly half the United Kingdom's imports of hardwoods came from the Colonial territories. A new copper smelter and textile plant were opened in Uganda, and a large expansion in bauxite production is planned in Jamaica and British Guiana. The value of Colonial exports was about 6 per cent higher than in 1955 and the value of imports rose by 9 per cent, the general pattern of Colonial trade showing little change.

Two new irrigation schemes have been inaugurated in Tanganyika, and progress is being made on three major irrigation projects in Kenya and in the exploitation of the limited water resources of Cyprus, while effect has been given to a scheme to establish an agricultural tractor and implement testing unit in

* The Training of Workers within the Factory. Pp. 90. (European Productivity Agency for the Organization for European Economic Co-operation, 1957.) 6s.

* The Colonial Territories, 1956-1957. Pp. xxv + 185. (Cmd. 195.) (London: H.M. Stationery Office, 1957.) 7s. net.