Mr. F. Courtney Harwood (Launderers' Research Association), Mr. S. H. Clarke (Fire Research, D.S.I.R.), the Hon. L. O. Russell (Institute of Management) and Sir Thomas Hutton (Productivity Council). The conference had shown how many resources are available for improving productivity and meeting its technical, its economic and its human problems. All these resources are not everywhere known or used. To overcome this there are two main national agencies. The British Productivity Council, with its decentralized regional organization and circuit system, endeavours to bring management and workers together in every main industrial area, making use of modern methods of presentation. The second agency is provided by the research associations and the Department of Scientific and Industrial Research with its stations. These bodies have valuable contacts with industry since they impinge directly on the particular industrial sectors of which they have expert knowledge. They have already done a great deal and are converted to the objects of the conference. Nevertheless, their structure, especially that of the research associations, permits them to do more; the value of the conference will depend upon whether it succeeded in establishing that interest in scientific and technological research should not limit the effort to convert industry as a whole to the principles which those attending the conference accepted.

X-RAY APPARATUS AND ASSOCIATED TECHNIQUES

EXHIBITION IN LONDON

As in previous years, an exhibition of X-ray apparatus was arranged in conjunction with the annual congress of the British Institute of Radiology, and was held at the Royal Horticultural Hall, London, during November 23–26. The majority of the exhibits were concerned with medical applications, both diagnostic and therapeutic, but industrial and scientific instruments were also represented.

Perhaps the most striking feature of modern electronic components and instruments is the way in which improvements in design and in materials have made possible reductions in size and in power consumption. This was well exemplified by much of the X-ray equipment on show. The increased use of oil-immersed components has resulted in compact single-unit power supplies for X-ray tubes, some of them incorporating series triode control valves which permit instantaneous high-tension switching as well as current and voltage stabilization. Another advance in this direction was represented by new oil-immersed high-tension rectifiers the filaments of which consist of thoriated tungsten with a power consumption less than one-third of that of pure tungsten filaments. Another interesting power supply includes a fly-wheel energy-storage generator which makes it possible to obtain a short-duration X-ray burst of very high intensity without drawing a heavy load from the mains supply.

X-ray tubes themselves have become more mobile; oil-insulated industrial tubes permit underwater radiography, and medical diagnostic and therapeutic tubes are mounted on cradles or above tilting tables which allow them and the patients to be moved automatically or with finger-tip control. Higher intensities are provided by the large range of rotating anode tubes. Another approach to the intensity problem in radiography is provided by the development of more-sensitive detecting devices. A new X-ray film is claimed to be 50 per cent faster than any previous type. Of even greater interest, perhaps, are the new image amplifiers, several examples of which were on show. In these tubes X-ray energy is first converted into light energy by a thin fluorescent screen, in contact with which is a photoelectric surface which, in turn, converts the light into electron emission. The electrons are accelerated by a high potential and focused on a final output screen. By these means the limit of brightness for threshold vision is reduced by a factor of 10 : 1, while the exposure time in fluorophotography is in the ratio of 200 : 1 as compared with the image produced on a normal fluoroscopic screen.

Artificial radioisotopes are becoming of ever-increasing importance both in therapy and in radiography. This fact was reflected in the many instruments on show for the handling and the detection and measurement of high-activity sources. The measuring instruments exhibited ranged from a simple 'nurse-proof' radiation monitor to fully automatic equipment capable of measuring the activities of up to 425 planchet-mounted samples to any desired degree of accuracy without any intervention from a human operator, the results being printed by the machine.

In X-ray therapy the deleterious effects of radiation on healthy tissue are now guarded against, so far as possible, by arrangements of ingenious geometry such as those employed in arc irradiation and in moving-beam methods. A new possible way of reducing radiation burns, which may be of great potential importance, is the discovery of the inhibitory effect of cortisone injections on acute X-ray damage to animal tissue. Discoveries like the last, together with apparatus as yet in the experimental stage, were demonstrated in a small scientific section at the exhibition. In general, the main commercial part of the exhibition demonstrated that the X-ray industry is quick in developing new ideas to a production stage.

U. W. Arndt

THE AGE OF THE UNIVERSE

The Philosophy of Science Group of the British Society for the History of Science last year offered a prize for "the best essay on: What is the logical and scientific status of the concept of the temporal origin and age of the universe?" Twenty-six essays were submitted, and a selection of six of these is published as the major portion of the November issue of the *British Journal for the Philosophy of Science*. The subject is considered from various points of view, the competitors having been asked to "clarify the logical, theoretical and observational aspects of the idea of assigning a quantitative age to the Universe". Naturally the essays vary in the distribution of emphasis between these aspects, and in those published the evidence most relied on ranges from the almost entirely logical to the equally one-sided observational kind. The value of the publication as a whole is thus greatly enhanced, and one receives the impression that the editors have made