

## New Super X-Ray Machines for Health Service.

### FOUR MILLION VOLT LINEAR ACCELERATORS ORDERS FOR FIVE PLACED.

RESOURCES UNDER THE NATIONAL HEALTH SERVICE for the treatment of cancer and other diseases will be considerably strengthened when five super-voltage X-ray therapy machines of new design become available for use in the United Kingdom—the first probably early in 1952.

These machines, of all-British design, craftsmanship and materials, will be capable of producing the effect of four million volt X-rays. Orders for them have been placed by the Ministry of Health, in conjunction with the Department of Health for Scotland.

The actual allocation of the machines, known as Linear Accelerators, has not yet been decided, but one will be centred in London, another in Scotland, and the other three in the provinces.

#### Link with Atomic Energy Research.

The Linear Accelerator began as an idea in 1945 when experimental work in this direction was first undertaken by a team at the Atomic Energy Research Establishment of the Ministry of Supply at Malvern. They constructed an experimental four million volt machine which was first operated in February, 1948.

Britain has a lead both in the design of these instruments and in their application to X-ray therapy. The completion of these four million volt machines will mark an advance in the equipment available for treating certain types of cases, especially those with deep-seated growths.

#### New Machine is Small and Mobile.

The five machines ordered by the Ministry, which will incorporate the latest technical developments, will only be about 5 ft. long. This is remarkably compact for a machine of this high voltage. As a result it will be possible for the machine to be actually swung about inside the hospital treatment room. Mounted on special supports it can be moved in an arc round the patient in order to adjust the direction of the X-ray beam. By this means it will be made easy to direct the beam at any required angle into the patient for carrying out the complex "cross-fire" techniques which are used to-day.

Despite their power these machines will be as easy to operate as those of 200,000 volts at present used in Hospitals. Their mobility and flexibility plus their super-voltage also mean that the number of patients who can be treated in a given time will probably be greater.

The overall cost of the five machines, including installation, will probably be between £200,000 and £225,000.

#### How the Machine Works.

The operation of the Linear Accelerator depends upon the use of very high power radio waves, generated by magnetrons, the special valves which as a British war-time invention were the nerve centre of Radar. A stream of electrons is passed down an evacuated tube together with the radio waves, which serve to accelerate the electron stream so that when it reaches the far end of the tube it has a very high velocity. The electrons are accelerated by the radio waves much in the same way as a surf rider is carried forward by a sea wave. Thus the electrons are accelerated to the velocity corresponding to four million volts, while at no time does the machine produce this voltage, so that the difficult problem

of providing insulation for so high a voltage is avoided. At the far end of the accelerating tube the electron stream strikes a gold target and generates four million volt X-rays.

#### Ten million Volt Research Machine.

The five Ministry of Health machines will incorporate many features which are being used in a ten million volt Linear Accelerator which is being constructed for the use of the Medical Research Council and is now nearly complete. This is a larger and more elaborate machine intended for research in the use of multi-million volt X-rays. Its specification was drawn up by the Atomic Energy Research Establishment Linear Accelerator team, in collaboration with the Radiotherapeutic Research Unit of the Medical Research Council. This machine is now being tested at Manchester and will be on show there to delegates of the 6th International Congress of Radiology. Later it will be installed at the Medical Research Council's Radiotherapeutic Research Unit at Hammersmith Hospital, London.

A Ministry of Health spokesman said that while the Linear Accelerator represents an important advance in cancer therapy, it must be emphasised *that it is not a new cure*. Before the new apparatus can come into general use for the treatment of patients, it will not only have to be erected and installed but will require careful testing in its technique of application.

## Diphtheria Success Spells Danger.

### MINISTRY'S WARNING.

ALTHOUGH DIPHTHERIA IS BEING HELD in check as an epidemic disease, the Ministry of Health is disturbed at the falling-off in the numbers of babies and children immunised.

The returns for England and Wales show that over 140,000 fewer babies were protected in 1950 than in 1949. The figures fell by 23,000 during the first six months of the year and for the second half were 117,000 down.

Since the immunisation campaign began in 1941 over 9 million babies and children have been immunised. Diphtheria deaths have fallen from a pre-war average of 2,800 to 49 last year—a new low provisional record. Cases during the same period have declined from 55,000 a year to 980—also a new low provisional record.

A Ministry of Health official commented:—  
"The Ministry hopes that this striking decline in diphtheria is not going to lull parents into a false sense of security. If we are to keep diphtheria at bay, it is essential that the level of immunisation should not fall. We may have diphtheria epidemics again, if parents leave their children unprotected against this deadly disease."

## The Royal Sanitary Institute.

THE ROYAL SANITARY INSTITUTE announce that a Conference on the Report of the Catering Trade Working Party on Hygiene in Catering Establishments, to be held at the Royal Sanitary Institute, 90, Buckingham Palace Road, London, S.W.1, on Wednesday, July 18th, 1951.

11. a.m.—(1) Address by Sir William Savage, M.D., D.P.H., Chairman of the Catering Trade Working Party, on the aims and recommendations of the Report; (2) Paper by Professor G. S. Wilson, M.D., F.R.C.P., D.P.H., Director, Public Health Laboratory Service.

2 p.m. (3) Paper by Captain Kenneth C. McCallum, M.C., Managing Director, Trust Houses, Ltd.; (4) Paper by Dr. W. R. Martine, O.B.E., T.D., Senior Assistant Medical Officer of Health, Birmingham; (5) General discussion. Chairman: Sir Weldon Dalrymple-Champneys, Bt., M.A., D.M., F.R.C.P. (Vice-President).

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