

## Cyclotron for Medical Research

THE only Cyclotron Unit in Britain to be used in conjunction with medical radiobiological study and clinical applications has been operating for more than a decade at the Hammersmith Hospital. The Unit is completely owned and run by the Medical Research Council and is used by staff within the Unit, by other workers and post-graduate students at Hammersmith, and by visitors from other medical centres. In addition to the 15-MeV cyclotron, the Unit operates an 8-MeV linear accelerator and a 2-MeV Van de Graaff machine, thereby giving a wide range of radioisotopes needed for radiobiological research.

The cyclotron, built in 1955 at a cost of £250,000, has the great advantage of producing isotopes of very short half-life—ones that will last in the patient's body long enough for measurement but no longer. Since the Unit is on hospital grounds, it is practicable to use such isotopes as carbon-11, nitrogen-13 and oxygen-15, which have half-lives of 20 min, 10 min and 2 min respectively. It has also proved possible to use bone-seeking isotopes with short half-lives. In this respect, fluorine-18 has been used successfully to find bone lesions.

Radiation studies within the Unit are largely concerned with neutron beam experiments. According to the director of the Unit, Mr. D. D. Vonberg, one of the reasons for installing the cyclotron is to study the use of neutrons as an alternative to X-rays for radiotherapy, especially on cancerous tissues. Some cancers have a poor blood supply so that many of the cells are anoxic. The efficiency of X-rays on anoxic cells is reduced by as much as two-thirds, but neutron beams lose very little of their cancer-destroying efficiency. This line of research was first studied at the University of California at Berkeley but was stopped by the Second World War. Over the past ten years at Hammersmith, much research has been done on animal tumours but none on human patients. However, the hope is that the fast neutron beam can be used to treat certain types of malignancy and will be available soon for clinical use. Dr. R. L. Morgan, a radio-therapist involved in this study, stresses that while this may prove to be a useful application of the neutron beam, it is not the all-purpose cancer cure; it can only be considered a technical advance that will be useful in certain cases.

Other experiments involving the cyclotron include a tracer experiment studying the control of ventilation by carbon dioxide concentration and comparing the experimental results—the control loop being simulated by an analogue computer.

Another interesting clinical application is the use of oxygen-15 to trace heart lesions in the septum wall. In a very simple and brief test, oxygen-15 is breathed in and traced as it passes from the lungs in the form of carbon dioxide; if blood passes through a hole into the right side of the heart, a small decrease followed by a small increase, or a 'recirculation peak', would be noted as the extra blood is carried to the lungs.

In addition to the collaborative medical work with radioisotopes, the Unit provides its own engineering, radiochemical and radiation protection sections to deal with problems of accelerator design, chemical separation and purification of isotopes, and problems of radioactive contamination, leakage, and waste disposal.

## Announcements

W. O. BAKER, vice-president of research at the Bell Telephone Laboratories, has been awarded the Priestley Medal by the American Chemical Society.

J. W. GARDNER, secretary of Health, Education and Welfare, has been awarded the Public Welfare Medal of the U.S. National Academy of Sciences for "eminence in the application of science to the public welfare".

MR. C. S. RICHENBERG, a senior examiner at the British Patent Office, is embarking on a study of the policy, law

and practice relating to patents in a number of countries overseas. He is particularly concerned with "problems arising out of the present state of technology", and says that he would welcome the views of interested persons on "what they consider to be serious basic shortcomings of law and practice".

THE third international Congress of Radiation Research will be held in Cortina d'Ampezzo during June 26–July 2. Further information can be obtained from the Secretary-General of the Congress, Casella Postale 2359, Rome A-D.

A SYMPOSIUM on "The Molecular Biology of Viruses" will be held in the University of Alberta during June 27–30. Further information can be obtained from Dr. J. S. Colter, Department of Biochemistry, University of Alberta, Edmonton.

A MEETING of the Physical Biochemistry Group of the British Biophysical Society will be held at the Unilever Research Laboratory, Bedford, on June 29. Further information can be obtained from Dr. P. Johnson, Colloid Science Laboratory, Free School Lane, Cambridge.

THE eleventh annual meeting of the Health Physics Society will be held in Houston during June 27–30. Further information can be obtained from O. L. Pirtle, jun., Hastings Radiochemical Works, P.O. Box 60448, A.N.S., Houston, Texas.

THE second Rochester conference on "Coherence and Quantum Optics" will be held in the University of Rochester during June 22–24. Further information can be obtained from Dr. Emil Wolf, University of Rochester, Rochester, New York.

A CONFERENCE on "Precision Electromagnetic Measurements" will be held at the Boulder Laboratories of the National Bureau of Standards during June 21–23. Further information can be obtained from Mr. J. Cronland, Bureau of Continuation Education, 328 University Memorial Center, University of Colorado, Boulder.

THE second Canadian wood chemistry symposium, sponsored jointly by the Chemical Institute of Canada and the Technical Section of the Canadian Pulp and Paper Association, will be held in Sainte Marguerite, Quebec, during June 22–24. Further information can be obtained from Dr. D. B. Mutton, International Cellulose Research, Ltd., Hawkesbury, Ontario.

A SYMPOSIUM on "Discontinuous Waves" will be held by the Department of Mathematics, University of Strathclyde, in collaboration with the Institute of Mathematics and its Applications, in the University during June 30–July 1. Further information can be obtained from the Registrar, Institute of Mathematics and its Applications, Maitland House, Warrior Square, Southend-on-Sea, Essex.

THE third congress of the International Federation of Automatic Control, organized by the United Kingdom Automation Council with the co-operation of the Secretariat of the Federation and of its national member organizations, will be held in London during June 20–25. Further information can be obtained from the Secretariat of the Congress, c/o the Institution of Electrical Engineers, Savoy Place, London, W.C.2.

THE seventh International Congress of Gerontology, organized by the Austrian Society for Geriatrics, will be held in Vienna during June 26–July 2. The main themes of the Congress will be: the role of environment in ageing; adaptability in ageing persons; methodology, research and education in gerontology; current trends in gerontology; age, work and social change; problems of therapy in gerontology. Further information can be obtained from the Secretariat of the Congress, Wiener Medizinische Akademie, Alser Strasse 4, Vienna IX.