the electron beam is misdirected.

Partly because this accelerator is the most recent of its kind, and partly because certain particular characteristics were specified to the contracting manufacturer, the linac has several desirable operating features. In the first place it is an extremely stable machine, with excellent reproducibility of performance from day to day. This is essential for its use in the development of standardization instruments. Secondly, there has been installed halfway along the accelerator an electromagnet of novel design, known as a pretzel magnet, which behaves as a perfect mirror when it is switched on, and "reflects" the electron beam through ninety degrees without changing its characteristics in any way. The first half of the accelerator may therefore be used by itself as a low-energy electron linear accelerator, for experiments which do not require the full machine capability. Thirdly, the electron injector takes advantage of the most recent engineering developments, and makes it possible to generate extremely short pulses of electrons (lasting three billionths of a second) at very high currents (five amperes).

The electron linear accelerator may be applied fruitfully in many of the natural sciences. In addition to dosimetry, two areas of research have been established to take advantage of the properties of this particular accelerator. These are the fields of pulse radiolysis and photoneutron spectroscopy, and both take advantage of the accelerator's excellent short pulse characteristics. Both fields are relatively new, and have developed partly because of availability of high-current, short-pulse, electron linear accelerators. Pulse radiolysis is the study of the short-term behavior of materials under the influence of ionizing radiations, and is a branch of radiation chemistry, with implications in liquid and solid state physics. Photoneutron spectroscopy is a specialized area of nuclear physics, where the properties of nuclei are investigated by observing the neutron distributions obtained when nuclei are irradiated with X-rays. Physicists from Trent University are already actively collaborating with the photoneutron group in their studies.

"Besides serving as a very important facility for the development of national standards in the field of ionizing radiations, one of the most pleasing aspects of the accelerator program is the fact that fields of research which are now developing are of considerable interest to research workers in a number of Canadian universities and research institutes," says Cyril Garrett, Head of the X-Ray and Nuclear Radiations Laboratory. "More programs of this type should be developed in similar major federal government facilities and it is anticipated that further co-operative programs will be established in the very near future in the fields of dosimetry and pulse radiolysis."

Dr. K. H. Lokan and Alex Nowak examine a target following an experiment with the electron linear accelerator.

MM. K. H. Lokan et A. Nowak examinent une cible irradiée par l'accélérateur linéaire.