

## NEW ATOM SMASHER

A 20-million electron volt particle accelerator or "atom smasher" that will permit precise measurements of the shapes and motions of the nuclei of atoms will be installed at the Chalk River Nuclear Laboratories, Atomic Energy of Canada Limited announced recently.

The \$3-million machine, which will be mounted in a 130-ton steel tank 81 feet long and 18 feet in diameter, will accelerate beams of electrically-charged particles to speeds greater than 133,000,000 miles an hour in order to penetrate the high electric fields forming barriers round the nuclei of target atoms. Studies of the results of this bombardment will enable physicists to obtain new data on the arrangements of particles in atomic nuclei and on the forces binding them together.

Known as the MP Tandem Van de Graaff, the machine is being designed and built by the High Voltage Engineering Corporation, Burlington, Massachusetts. Delivery of components to Chalk River is expected to begin early in 1965. The steel pressure vessel will be so large that it will have to be shipped in sections and assembled at the Chalk River site.

The machine is a development of the 10-million electron volt Tandem Accelerator built by the same company. The first such Tandem Accelerator was designed and built for AECL and went into operation at Chalk River in 1959. It has enabled AECL physicists to add considerably to the knowledge of atomic structure. Twenty-one other Tandem Accelerators were subsequently purchased by physics research laboratories in several countries.

### EXTENDING NUCLEAR RESEARCH

With the MP Tandem Van de Graaff, AECL physicists will be able to extend the nuclear research that has produced information not obtainable by any other means. In addition to yielding precision measurements of the shapes and motions of nuclei, the new accelerator will make possible the study of reactions between medium-weight nuclei. In a sense, this is the reverse of the fission that takes place in a nuclear reactor and produces medium-weight nuclei by the splitting of uranium, the heaviest element occurring in nature.

The higher energy of the new machine and its ability to accelerate heavier projectiles (the electrically-charged particles used to bombard target materials) will make possible the determination of physical properties in high radiation fields. The machine will produce more intense radiation than can be produced in a reactor. The MP Tandem will open up a broad field of research of special interest to chemists and metallurgists.

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### DRUG FREED FOR RESEARCH

Lysergic Acid Diethylamide (LSD), an experimental drug recently banned from general sale in Canada, will continue to be available under strict controls for clinical and laboratory investigation. The conditions for such use have been announced by Mr. J. Waldo Monteith, the Minister of National Health and Welfare.

LSD has never been on the Canadian market commercially, but it is in international experimental use in psychiatric treatment. Many authorities feel that administration of the drug, except by the most expert hands, can lead to serious consequences. The recent expiry of patents owned by LSD's Canadian manufacturer raised the possibility that the careful distribution exercised to date might not be continued. It was considered necessary to place Lysergic Acid on a new schedule to the Food and Drugs Act included in amendments to the Act passed by Parliament in December. Drugs listed on the new Schedule H are prohibited from sale, subject to any exemptions provided by regulation.

Under the regulation recently approved by the Governor-in-Council, and published in the *Canada Gazette*, LSD may be sold by a manufacturer to an institution approved in advance by the Minister of National Health and Welfare "for clinical use in the institution by qualified investigators for the purpose of determining its hazards and efficacy" or "for laboratory research in the institution by qualified investigators". Before selling LSD, a manufacturer is required to inform the Minister of the name and address of the institution to which the drug is to be sold and the quantity and dosage form involved. Ministerial approval is required before the sale can be made.

Any institution engaged in research or clinical investigation and approved by the Minister must maintain detailed records on use of its LSD purchases, including the names and qualifications of the investigators and full data on the methods and results of its studies.

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### AIRBORNE MARINE THERMOMETER

The airborne radiation-thermometer developed by the Pacific Oceanographic Group of the Fisheries Research Board of Canada has proved very successful, the annual meeting of the Board was told in Ottawa recently. This thermometer is, as its name implies, a device permitting readings of water surface temperatures from high-speed aircraft. Following successful trials, four new units are being built for use on the Pacific and Atlantic coasts. They incorporate improvements to the first model.

The Pacific Oceanographic Group has its headquarters at the Board's Biological Station in Nanaimo, British Columbia.

The oceanographic-information service developed by the Group, in collaboration with other scientific bodies, has completed its first full year of operation on Canada's West coast. Officials say the service functioned successfully. In conception and operation, it resembles the Canadian Meteorological Service, providing regular assessments of oceanographic changes rather than of weather.

The oceanographic-information service is potentially an important aid to commercial fishing operations, as its scope and coverage are extended. The movements of fish are very closely related to temperature and other conditions in the sea, and prior knowledge of changes in these conditions will be of great use in locating fish at a given period and place.

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