

Radar systems are being tested as part of a program to accelerate the accurate survey of Canada. Shoran, a wartime radar development for blind bombing, provides the navigator of an aircraft with continuous and accurate measurement of his distance to each of two fixed ground-radar beacons.

Recovery of oil from Alberta bituminous sands by flash distillation in a fluidized bed of dry sand is being successfully done on a pilot-plant scale. Work has also started on the use of the same fluidized bed technique for the recovery of oil from New Brunswick and Nova Scotia shale and of sulphur from pyrites.

Recent tests on military and civilian aircraft have provided further evidence of the effectiveness of the rain repellent developed at the National Research Council in maintaining clear vision through aircraft windscreens when flying through rain.

The new silver catalyst developed in the Council's chemistry laboratories for the conversion of ethylene to glycol has been successfully operated for several months on a pilot-plant scale.

The use of modified lignin as a reinforcing and improving agent in some types of synthetic rubbers has been investigated on behalf of a Canadian paper mill.

Work in the Division of Applied Biology includes both fundamental and applied investigations on food preservation, utilization of agricultural crops and residues, fats and oils, seaweeds, biological macromolecules, plant science, animal science, and statistics.

Highlights of the work during the year are as follows: pre-slaughter treatment of hogs has important effects on the keeping quality of pork products; work on a model of a railway refrigerator car showed that changes in car design lower the carrying temperature by several degrees; a method has been developed for preparing pure, undenatured wheat gluten by spray drying; automatic pH control applied to bacterial fermentations indicates that pH control will prove to be just as important as controlling the temperature; and finally, an ultracentrifuge has been put into operation which, together with electrophoretic equipment, provides physical measurements on the fundamental properties of large molecules such as proteins.

At Saskatoon, Sask., the Prairie Regional Laboratory is now well established. Two new units have been equipped and staffed, one of these to work on carbohydrates, the other on proteins. Work was continued on oil seeds and agricultural residues, but was largely on pilot-plant projects. Erection of a starch-gluten separation plant has been started. Equipment for carrying on industrial fermentations has been installed as well as stills for solvent recovery of fermentation products. Oil seeds processing equipment and strawboard cookers, presses, and driers are now in operation.

Physics research includes work in ten main fields: acoustics, cosmic rays, electricity, heat, thermal conductivity and vapour migration, industrial radiology, metrology, optics, spectroscopy, X-ray diffraction and electron microscopy. A new group is now being added for work in theoretical physics.

While much of the work of the Physics Division is in the field of applied physics, undertaken with a view to increasing the efficiency of Canadian industry, it is being more and more recognized that studies in pure experimental and theoretical physics are important as a means of keeping investigators abreast of newer developments. The policy of appointing NRL fellows, selected from the universities of the world, has greatly increased the scope of the Division's fundamental work.