

will continue this winter at the Flight Research Station. Special automatic instrumentation for the tailless glider and instruments, including a cloud-droplet camera, for the measurement in flight of the meteorological conditions associated with aircraft icing, have been developed in the instrument laboratory.

In the low-temperature laboratory, opened early in the year, the cold chambers are now in full operation and tests on the behaviour of aircraft components, engines, vehicles, etc., at low temperatures are proceeding. Facilities for the static testing of full-scale components in the structures laboratory have been brought into operation and certain wings tested. Work has begun on the design of a laboratory to be equipped with supersonic wind tunnels and equipment for work on combustion, compressors and turbines,...

A special Geiger-counter equipment developed during the year as an aid in prospecting for radioactive ores in diamond drill holes, was given field tests. An absolute magnetometer using the fluxgate principle has been almost completed. Interesting work has been done on measuring the efficiency of hydro-electric turbines by the temperature drop in the water as it passes through the turbine.

#### OTHER EXPERIMENTS

Results of some observations on the adsorption of water vapour by wheat have been published. This subject is important because of the effect of moisture on the quality of wheat during storage. Some preliminary experiments were made during the year to determine the usefulness of the velocity of sound as a control in oil refining. A high-speed motion-picture camera designed to take pictures at 200,000 frames per second was completed. It has been operated successfully at 120,000 frames per second. No difficulty is anticipated at higher taking rates when special electrical equipment required for this purpose becomes available.

There has been a continued demand for development of both civil and defence radar equipment, and during the past year the Division of Radio and Electrical Engineering has co-operated with Canadian industry to put into production a modern marine radar set, which promises to have wide application,...

Considerable time has been devoted to more fundamental radar studies, particularly in connection with propagation and antenna design. Preparations have been completed for an exhaustive study of propagation in the microwave region over various types of snow surfaces. A continual demand exists for shorter and shorter wavelengths and the Division's tube laboratory is devoting its time to the development of tubes to operate at wavelengths shorter than one centimetre.

Radar equipment (32.5 megacycle) has been set up to study meteors in collaboration with the Dominion Observatory; the records obtained

have led to very interesting speculations, and it is believed that these studies, co-ordinated with visual observations, will result in a much better understanding of meteor phenomena.

In the radio field, the ratio of signal-to-noise strength is a most important factor and depending upon the frequency of the equipment, the noise which becomes a predominant problem may originate within the equipment itself or externally. To study this latter source of noise a new station has been established near Ottawa to obtain further solar-noise records in the ten-centimetre region.

A five-million-volt van de Graeff generator has been completed for the Atomic Energy Project to assist in nuclear studies and a one-half million volt unit has been completed for the Division of Chemistry. A third accelerator of the cavity-type, employing excitation at a frequency of 3,000 megacycles, has been built experimentally and an eight-million-volt output has been realized.

Various electronic devices have been completed, including: a pH monitor, which measures and controls the pH of biological culture media to a high degree of precision; an infrared detector for locating hot joints on power transmission lines; and a panoramic ionosphere recorder which sweeps through a frequency range of 1 to 20 megacycles for determining the character of the ionosphere. The Division has embarked on a fundamental study of dielectric theory and a laboratory for this purpose is now being set up.

#### FOOD PRESERVATION

Both fundamental and applied investigations on food preservation, utilization of agricultural crops and residues, fats and oils, plant science, animal science, and statistics are being carried on in the Ottawa laboratories of the Division of Applied Biology.

Studies have been continued on food bacteriology, especially microbiological content of butter and assessment of various organisms as a measure of fecal contamination in egg products. Most of the previous chemical studies on egg products have been completed, with the exception of fundamental work on the browning reaction in dried egg powder. After many difficulties, butter containing 16% moisture (the legal maximum) was consistently produced from the Fritz continuous butter-making machine. Work on seaweed extracts has been resumed. From rape and mustard oils, edible shortenings were produced that could not be distinguished by flavour and odour ratings from commercial shortenings prepared from other oils.

In non-food uses of agricultural products, many moulds and bacteria are being examined, both in laboratory and pilot-plant operations, with a view to the production of industrial chemicals. Work on the fermentation of grains has been carried to a stage of completion and similar studies are now devoted to other products such as molasses. Improvements were made in the pilot-plant separation of starch and

gluten from wheat flour. Dry undenatured gluten was prepared in the laboratory and these findings are now being translated to pilot-plant operations....

**COST-OF-LIVING DOWN:** Showing the first decline of any consequence since September, 1945, the Bureau of Statistics cost-of-living index fell from 159.6 to 158.9 between November 1 and December 1, 1948. During the previous month the index had been unchanged, and the decline during November brought the index back to the same figure as recorded for September 1. The latest index standing compares with 146.0 at December 1, 1947, 127.1 at the same date in 1946, and 120.1 in 1945.

The fall of 0.7 points at December 1 was due to a drop in the foods index, all other group indexes being fractionally higher or unchanged. An unusually sharp decrease in the price of eggs and moderate reductions among meats, vegetables and fruits sent the food index down from 204.7 to 202.0 between November 1 and December 1. In the previous month the food index had declined from 205.4 at October 1, making a two-month's decline of 3.4 points.

As expected, the rent index adjusted quarterly, moved upward, from 121.0 to 121.7, the increase representing the net change from September 1 to December 1.

**MARKETINGS OF WHEAT:** Stocks of Canadian wheat in store or in transit in North America at midnight on December 23 amounted to 172,294,000 bushels, showing a decline of 2,830,000 bushels from the December 16 figure of 175,124,000 bushels, but 30,536,000 bushels in advance of last year's corresponding total of 141,758,000 bushels.

Deliveries of wheat from farms in the Prairie Provinces during the week ending December 23 totalled 3,071,000 bushels compared with 2,063,000 in the same week a year earlier. Overseas export clearances during the week amounted to 2,913,000 bushels as against 1,069,000 a year ago.

**DEPARTMENT STORE SALES:** Department store sales rose 10 per cent in November to reach a total of \$89,706,000 as compared with \$81,579,000 in the corresponding month of 1947. The gain in the month was slightly under the average advance of 13 per cent for the first 11 months of the year. Dollar value of sales for the cumulative period was \$694,904,000 as compared with \$613,686,000 a year earlier.

**CARIBBEAN EXERCISES:** The Minister of National Defence, Mr. Claxton, announced on January 7 that three platoons of Canadian troops commanded by Capt. R. J. G. DesRivieres, of Quebec City, were taking part in current U.S. amphibious exercises in the Caribbean.

Ships of the Royal Canadian Navy are also taking part, the Minister said.

This is in accordance with the arrangement whereby officers and men and training facilities are exchanged from time to time between the two countries.

Groups of Canadian soldiers have joined American forces in similar amphibious exercises in the past. They have been using the facilities of the U.S. amphibious training school near Norfolk, Va., and usually they are invited to take part in any exercises the Americans put on while the course is in progress.

**SPRING CRUISE PROGRAM:** Six operational units of the Royal Canadian Navy will participate in a spring cruise program commencing January 28 and continuing for three months, it was announced January 7 by the Minister of National Defence, Mr. Claxton.

During one phase of the program the six-ship R.C.N. task force will carry out joint exercises in Caribbean waters with units of the British and United States fleets.

The Canadian task force will consist of the Halifax-based light fleet carrier "Magnificent" and the destroyer "Haida", and four west coast ships the cruiser "Ontario", destroyers "Athabaskan" and "Crescent" and the frigate "Antigonish".

The "Magnificent's" air component will be 803 and 883 Sea Fury Squadrons and 826 Firefly Squadron of the Royal Canadian Navy.

The schedule has been designed to provide a maximum amount of practical sea training for officers and men of the R.C.N. and R.C.N. (Reserve).

The four west coast ships will leave their Esquimalt base January 28 for Magdalena Bay, Mexico, with the "Athabaskan" and "Crescent" detaching en route to fuel at San Diego, California. After an 11-day work-up period at Magdalena Bay, the group will proceed to San Diego for fuel and for exercises with United States forces.

On completion, the ships will proceed to Acapulco, Mexico, and from there to the Canal Zone and a rendezvous March 16 with the "Magnificent" and "Haida."

On March 19 the Canadian task force will rendezvous in the Caribbean with units of the British West Indies fleet and, after calling at St. John, Antigua, the combined squadrons will sail for Guantanamo Bay, Cuba, linking up en route with the Carrier U.S.S. "Midway" and other American units.

On completion of exercises in the vicinity of Guantanamo, the west coast group will depart for home, going by way of the canal and Long Beach, California. They are due back in Esquimalt April 28.

The program for the "Magnificent" calls for her to sail from Halifax January 13 for the United Kingdom, where she will embark the new Firefly V anti-submarine aircraft of 825 Squadron.