

Engineering problems include long-range transmission of high-voltage direct current, corona studies, electronic aids to navigation, current and potential transformer investigations, rocket telemetry, and the development of electronic medical instruments and operating-room facilities. The Division maintains the best-equipped antenna laboratory in Canada and provides considerable assistance to Canadian industry in the development and manufacture of new antennas and radomes. Examples of recent developments by the Division are a compact transistorized marine radar for use by pleasure craft and fishing vessels, an underwater crash position indicator for locating submerged aircraft, an area display electrocardiograph showing the time variation of heart voltage between 70 points on the body, and a creative tape recorder much in demand by electronic music studios. A highly mobile counter-mortar radar designed by the Division went into commercial production in 1961.

Fundamental studies are carried out in the fields of radio astronomy, upper atmosphere research, surface physics, and solid state physics. The Division is currently developing a radio observatory in Algonquin Park which will feature a radiotelescope having a parabolic reflector 150 feet in diameter. This apparatus is expected to be fully operational in the spring of 1966. A radiotelescope 33 feet in diameter is now in operation at the site.

**Atlantic Regional Laboratory.**—The Atlantic Regional Laboratory is engaged in practical and fundamental studies related to the resources and industries of the Atlantic Provinces. The work follows three general lines: chemical reactions at high temperatures; structures and reactions of naturally occurring organic compounds; and the biochemistry and physiology of fungi, marine algae, mosses, lichens, ferns and higher plants. Examples of specific projects are studies of the nucleic acids of seaweeds, a botanical survey of the peat bogs of Newfoundland and Labrador, and the determination of the molecular structure of several new substances isolated from marine plants. A number of new compounds have also been isolated from land plants, and these are being investigated. The high temperature studies are aimed at providing basic information of use in steel-making and related industries.

A recent development of considerable significance is the establishment of a close working relationship with Dalhousie University at Halifax. Under the new arrangement, students acceptable to the University's Faculty of Graduate Studies may now carry out research in the Atlantic Regional Laboratory, directed by Laboratory staff members holding unpaid appointments in the Faculty. The immediate aim of the scheme is to expand the facilities for graduate studies in the Atlantic region. In the long run, the objective is to help create a strong scientific background conducive to large-scale development by industry.

**Prairie Regional Laboratory.**—One of the chief aims of the Prairie Regional Laboratory is to develop wider uses for crops grown on the prairies. This is achieved by determining potential uses of crops now in production and by encouraging the production of new crops to meet specific needs. Research is therefore carried out on the properties and reactions of plant components, and on the biological, chemical and engineering processes for turning them into other compounds. The development of oil-seed crops as alternatives to seed crops has received considerable attention.

For some time, the Laboratory has studied major plant constituents such as carbohydrates, protein, starch, lignin and fibres. An example of this work is the definition of the chemical structure of several polysaccharides found in cereal grains and important in baking, milling and fermentation technology. Attention is also being given to minor plant constituents—such as phenols, flavonoids and terpenes, which are known to have fungicidal and germicidal properties. A laboratory has been set up to systematically study extractives from local plants and shrubs.

The engineering and process development group is engaged in research on continuous fermentation processes, pulping processes on wood and straw fibres, and the effects of