

evaporated milk during sterilization are being investigated. Microorganisms related to food are studied, particularly those that grow in cheese, in high salt concentrations and at low temperatures. A national culture collection of about 3,000 yeasts, bacteria and fungi is maintained.

Considerable effort is devoted to questions of animal and plant physiology. Studies of the mechanisms by which mammals, birds and man adapt to cold have provided important basic information on cell, muscle and metabolic activity, and help to explain practical problems such as the high death rate of newly born caribou. Fundamental plant processes such as translocation are investigated, and a study is being carried out on strains of blue-green algae believed responsible for cattle deaths. Plant fibres such as cellulose—the skeletal material of plants—and the structure and function of plant cell components are also examined.

Other studies involve fermentation mechanisms and enzymology, and the structures of proteins, polysaccharides and lipids. One group, among its other projects, is engaged in long-term statistical studies of protein variability in wheat, a factor that influences overseas wheat sales. The work has been expanded recently to include the effects of weather factors on protein content.

**Radiation Biology.**—The effect of radiation on living things, including people, is the subject of research in the recently organized Division of Radiation Biology. The Division will eventually be housed in a new building being erected in close proximity to the buildings housing the major applied Divisions of the Council. A variety of types of radiation will be used, including ultra-violet light, gamma rays, X-rays, electrons and fast neutrons. The physical, chemical, functional and statistical changes brought about by irradiation of pure chemicals, biochemicals (enzymes and macromolecules), cells, tissues, microorganisms, plants, animals and human or animal populations will be investigated. Studies will also be made of radiations arising within biological materials as well as those originating outside. Where possible, observations will be made of the effects of radiations delivered at widely differing dose rates.

**Applied Chemistry.**—The Division of Applied Chemistry is concerned with supplying new scientific information for the development of Canada's natural resources and chemical industries. Although formerly much of the work involved the solving of immediate specific problems, a larger part of the Division's effort is now being devoted to more basic studies. This avoids conflict with industrial laboratories and consultants and, in addition to providing fundamental information, often produces practical results. For instance, a long-term investigation on the contacting of fluids and solids—an operation vital to many chemical engineering procedures—has resulted in a successful commercial operation for drying grain. The same method can be extended easily to chemical reactions and to removing liquids from other materials.

Another long-term project of considerable industrial potential has concerned the factors responsible for the stability, or the destruction, of suspensions of solids in liquids and a method was devised for easily separating almost any suspended solid from the liquid surrounding it. This work has been expanded to include the separation of dissolved solids. It has been shown that virtually all dissolved salts can be removed from water by filtration through an appropriate medium, and tests with other materials are in progress. Then, too, the study of chemical reactions at very high temperatures—carried on over the past several years—has resulted in the successful preparation of a stable polymer that could not be produced by conventional means.

The eleven sections of the Division are: analytical chemistry, chemical engineering, colloid chemistry, high polymer chemistry, high pressure, kinetics and catalysis, metallic corrosion and oxidation, metallurgical chemistry, physical organic chemistry, hydrocarbon chemistry and textile chemistry. Much of the work falls under the general headings of petroleum or corrosion chemistry, in that several sections work on topics related to one of these fields.