

Scholarships and grants-in-aid of research are awarded annually by the National Research Council. Scholarships awarded in science and engineering include Bursaries and Studentships with values of \$1,800 and \$2,200 respectively, Special Scholarships valued at \$2,200, and Postdoctorate Overseas Fellowships at \$2,700 (single) and \$3,500 (married). The Council also offers Graduate Medical Research Fellowships valued at from \$3,000 to \$5,000 depending upon academic qualifications and research experience. A limited number of Medical Research Associates and Postdoctoral Medical Research Assistants are also appointed to research positions in the medical schools of Canadian universities. Graduate Dental Research Fellowships are also available. In the year ended Mar. 31, 1960, 474 of these different awards totalling more than \$1,500,000 were made.

Since 1948, the National Research Council has awarded Postdoctorate Fellowships in open competition to Canadians and nationals of other countries, which are tenable in the Council's own laboratories. The diversity of training and experience brought to the laboratories by these keen young scientists has had such a stimulating effect on the research effort that the program has been expanded in recent years; Fellowships are also tenable in the science departments of Canadian universities, in the laboratories of Atomic Energy of Canada Limited, and in the Federal Departments of Agriculture, Mines and Technical Surveys, and National Health and Welfare. More than 200 of these awards are being held at the present time (March 1960), mostly in the fields of chemistry, physics and biology.

Principal Activities in 1958-59

The activities of each Division are described in outline only, with occasional brief examples. The work of the Atlantic and Prairie Regional Laboratories is treated separately at pp. 414-415.

Applied Biology.—This Division's work includes applied investigations related to the national economy, and fundamental studies in microbiology, biochemistry and biophysics as a basis for future application in agriculture, medicine or industry.

Problems of preparation, preservation and storage of food constitute a large part of the Divisional work. Specific studies in 1958-59 involved changes effected in foods during freezing and frozen storage, insulation and cooling of railway refrigerator cars, aeration of fermentations, controlled atmosphere storage of fruit, the processing and storage of milk, effects of irradiation on fats, and tenderness of meat.

Statistical investigation of variability of protein content in shipments of Northern wheat was expanded, and computation continued in a long-range study of the correlation between wheat protein and rainfall and temperature in the Prairie Provinces. The physiological and biochemical changes in mammals, birds and man in adapting to cold are being investigated, as are the structure and function of plant cells, problems of photosynthesis and translocation in plants, the structural determination of chlorophyll, and blue-green algae implicated in sheep and cattle deaths.

Other work involves the preparation, chemistry and physical chemistry of proteins and lipoproteins, the composition and structure of carbohydrates and fats, and studies concerning micro-organisms related to the preparation, preservation and spoilage of food. A culture collection of about 3,000 yeasts, bacteria and fungi is maintained.

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 solving immediate, specific problems, a larger part of the Divisional 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, recent studies in applied catalysis (the study of agents altering the speed of chemical reactions) also explained certain types of smog formation.