

to which a summer supplement of \$800 may be added. In addition, Special Scholarships valued at \$2,000 a year and Postdoctorate Overseas Fellowships at \$2,700 (single) and \$3,500 (married) are offered. The Council also offers Graduate Medical Research Fellowships valued at from \$2,000 to \$5,000 depending upon academic qualifications and research experience. A limited number of Medical Research Associates are also appointed to research positions in the medical schools of Canadian universities. Graduate Dental Research Fellowships are also available. In 1958-59, 338 different awards were made totalling \$522,500.

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 further expanded in recent years; Fellowships are also tenable in the science departments of Canadian universities and in the laboratories of other Federal Government Departments, such as Agriculture, Mines and Technical Surveys, and National Health and Welfare. More than 200 of these awards are being held at the present time, mostly in the fields of chemistry, physics and biology.

Principal Activities in 1957-58

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. 376-377.

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. Because fewer large-scale industries are directly interested in biology, industrial laboratories undertake far less research in the biological sciences than in the physical sciences. Of the wide diversity of biological problems urgently in need of investigation, the Division undertakes those considered to be most timely and most unlikely to receive early attention elsewhere. Much of the work is undertaken in co-operation with industry or for government agencies.

Co-operative work in 1957-58 included statistical studies of the protein content of western Canadian hard red spring wheat at different shipping points; a study of wind chill as a factor in caribou mortality in Arctic regions; an international expedition to investigate the aborigines of Central Australia as examples of adaption of human races to cold climates; and improved design and operating procedure of railway cars for the transport of perishables. Also investigated were the freezing and marketing of poultry, the humane slaughtering of animals, and the applicability of a jacketed cold room, previously developed for storage of frozen commodities, to controlled atmosphere storage of fruit.

Fundamental studies directed to extending the storage life of foods by irradiation, and applied investigations on the effects of irradiation on the rate of development of rancidity in bacon, were begun. Investigation continued on the fast-death factor in a strain of blue-green algae toxic to sheep, cattle and other animals, the transport of sugars and other foodstuffs produced by photosynthesis in plant leaves to other organs of the plant, and the structure and development of plant cells and their constituents.

Other work includes chemical and physical measurements on macromolecules of biological origin, and studies concerning micro-organisms related to the preparation, preservation and spoilage of food. A culture collection of about 3,000 bacteria, yeasts and fungi is maintained.

Applied Chemistry.—The Division of Applied Chemistry is concerned with the best uses of Canadian resources and with chemical problems of wide general interest. While much of the work could be included under the general heading of petroleum chemistry, other subjects of active interest are metallurgical chemistry and corrosion, textiles and detergency, rubber, chemical engineering and high polymers.