long-term studies on metallic corrosion. These films may have considerable potential as decorative or protective coatings, or to impart desirable electrical properties to the deposited layer.

The 11 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 metal chemistry, in that several sections work on topics related to one of these fields.

Pure Chemistry.—The Division of Pure Chemistry has a small permanent staff that works in collaboration with about 50 young postdoctorate fellows from all over the world. The work consists of long-term fundamental investigations in organic, physical and theoretical chemistry designed to provide new basic knowledge.

The work in organic chemistry includes investigations of the structures of alkaloids, studies of the infrared spectra of steroids, and the synthesis of nucleic acids, porphyrins and of compounds labelled with isotopes. Other groups deal with chemical kinetics and photochemistry, the study of the ionization potentials of free radicals by mass spectrometry, Raman and infrared vibrational spectroscopy, organic crystal semi-conductors, and the application of high resolution proton magnetic resonance techniques to the study of hydrogen bonding and other molecular interactions. Still others investigate the thermal properties of simple solids, the heats of micellization by microcalorimetry, and the thermodynamics and stress-strain relationships associated with the adsorption of fluids by active carbons. Theoretical studies cover quantum-mechanical and many-body problems.

Applied Physics.—The work in applied physics is divided between research in fields of physics deemed most likely to contribute in a practical way to the Canadian economy and research to improve the accuracy and precision of fundamental physical standards on which all measurements are based. All the fundamental physical standards for Canada are the responsibility of the Applied Physics Division, which has primary standards equal to any in the world in the fields of mass, length, time, electricity, temperature, photometry and radiation. The sections of the Division are: acoustics, diffraction optics, electricity, heat and solid state physics, instrumental optics, interferometry, mechanics, photogrammetric research, radiation optics, and X-rays and nuclear radiations.

Examples of specific projects under way include a study of physiological noise and its relationship with the threshold of hearing, resulting in the development of a new probe microphone which should find wide application in sound measurement; new precision and accuracy are envisaged for audiometers of great importance in connection with hearing loss in industry and elsewhere; researches directed toward improving the resolving power of optical systems, the design of a hydrogen maser offering potential as a frequency standard for defining time, measurements on various metals and ceramics aimed at elucidating the mechanism of heat transfer at high temperatures, the establishment of an international standard neutron source, and investigation and application of the very intense and very monochromatic radiation emitted by gas lasers. Several of the Division's developments are being produced commercially; among these are noise-excluding ear defenders, a revolutionary analytical plotter for making maps from aerial photographs (available in two models —one for military and the other for civilian use), six- and five-figure potentiometers, a precision direct reading thermometer bridge, an instrument for measurement of resistance to a precision of one part per million, and a new instrument for measuring more accurately and quickly electrical voltages of up to 3,000 volts.

To permit standardization of X-rays and nuclear radiations at higher energies and for general research in the energy range, the Division is currently installing a 4-MeV Van der Graaff generator and a 40-MeV linac facility which will be in full operation sometime in 1968.