

**Applied Chemistry.**—The Division of Applied Chemistry is concerned with the best uses of Canadian resources and with chemical problems of wide general interest.

The oxidation of iron and its alloys is an extremely complex problem and is estimated to cost Canada more than \$3,000,000 annually. Studies are being made of the mechanism of corrosion in aqueous solutions and of the oxidation of metals at high temperatures. At the same time, while the corrosion group is working to *prevent* oxidation, several other groups are endeavouring to *enhance* the oxidation of certain chemicals such as ethylene. The product is a very active chemical—ethylene oxide—and the starting point of many other useful materials such as antifreeze. A calcium silver catalyst shows considerable promise.

Work on rain repellents for aircraft wind screens has been brought to a conclusion with the development of a satisfactory one-coat material suitable for most applications. Lignin has been successfully substituted for carbon black in preparing a tire-tread stock. Work on thermoplastics and rubber adhesives for bonding rubber to metal is being continued.

One of the functions of the textile laboratory is to advise the Canadian Research Institute of Launderers and Cleaners, with which the Council has a formal agreement. The aim of this co-operation is to maintain a high standard of operation in Canadian cleaning establishments. Assistance is also given to government departments on such problems as the moth-proofing, rot-proofing and moisture-proofing of textiles. Synthetic detergents are also being examined.

Other industrial problems under investigation include the possible application of the spouted bed technique to industrial drying problems. A pilot model of a sedimentation device has been constructed and successfully operated. The Applied Chemistry Division also works on colloids, analytical chemistry, high polymer chemistry, metallurgical chemistry and physical organic chemistry.

**Pure Chemistry.**—The Division of Pure Chemistry is organized around a nucleus of outstanding Canadian chemists who direct about twice their own number of young postdoctorate Fellows from all over the world. The work is long-range and fundamental. The products of pure curiosity seem very far removed from ordinary life but the Division's experts are frequently invited to speak to groups of applied chemists and other scientists employed in Canadian industry. They also lecture in universities.

There are thirteen sections in the Division: organic chemistry, mostly on the structure of alkaloids; organic spectrochemistry; organic synthesis; chemical kinetics and photochemistry; mass spectrometry; molecular spectroscopy; surface chemistry; thermochemistry; activated carbon, inorganic and general chemistry; intermolecular forces and physical properties; fibre research; chemistry of fats and oils; and general physical chemistry.

**Applied Physics.**—The work on applied physics is divided between research projects likely to have a practical value and the continual development of the fundamental standards on which measurements generally are based. All the fundamental physical standards for Canada are housed and serviced in this Division.

The various means developed of decreasing noise from suction rolls in paper mills are now receiving full-scale factory trials. Also, investigation into anomalous drying of paper in the mill has led to recommendations of corrective measures which are now being tested.

Experiments to determine the absolute value of the acceleration due to gravity ("g"), measured by timing the rate of fall of a calibrated rule, show excellent reproducibility. Wavelengths proposed as the new international standard of length are being investigated and new sources for more precise wavelengths are being developed. Friction of inflated rubber tires on ice is being measured and investigations are being continued to develop a good method for testing the worth of winter garments in cold winds.