

While these three plants increased in size and diversity of production, it was not until the early 1950's that petrochemical growth accelerated rapidly in both Eastern and Western Canada, not only with respect to variety of product but also from the standpoint of types of feedstocks, new processes and methods of operation. In 1952, Shell Oil Company of Canada Limited pioneered the extraction of sulphur from natural gas in Canada and this was the forerunner of what grew, within a decade, to be the largest volume petrochemical in Canada. Canadian Chemical Company Limited completed a large plant at Edmonton, Alta., in 1953 to produce cellulose acetate for textiles, acetic acid and a variety of other chemicals. Cellulose is obtained from an affiliated pulp mill and propane and butane feedstocks are obtained from oil refineries and gas processing plants near Edmonton. The latter raw materials are partially oxidized to produce acetic acid and a wide range of oxygenated by-products such as alcohols, aldehydes and ketones. At the same time, Canadian Industries Limited constructed a petrochemical plant at Edmonton using ethylene derived from natural gas to produce polyethylene and, in Eastern Canada, Shawinigan Chemicals Limited, Shell Oil Company of Canada Limited and Union Carbide Canada Limited were completing plants at Montreal to produce a variety of petrochemicals from refinery streams. To add to the growth in petrochemical plants in 1953, Dupont of Canada Limited began producing nylon intermediates near Brockville, Ont., and Cabot Carbon Canada Limited commenced operations at Sarnia to produce carbon black for use primarily in the tire industry. In the next three to four years additional sulphur and ammonia plants were constructed in Alberta, Canadian Industries Limited completed a plant near Kingston, Ont., to produce polyester-type synthetic fibres from petrochemicals, and Ethyl Corporation of Canada Limited began production of tetraethyl lead as a gasoline anti-knock. Imperial Oil Limited became a petrochemical producer at Sarnia in 1957 to provide detergent alkylate, a basic ingredient of synthetic detergents, along with other basic raw materials. That same year, Canadian Oil Companies Limited produced the first petroleum-derived benzene.

While continued expansion occurred in many areas of petrochemical production in the intervening years, the major advances occurred in the natural gas processing industries and particularly in the development of sulphur-producing capacity. By 1962 there were seventeen plants in Western Canada extracting sulphur from natural gas and four additional ammonia plants using gas as a raw material, and a total of well over fifty plants, in all, producing chemicals derived from petroleum or natural gas.

The Industry Today.—The Canadian petrochemical industry is centred chiefly at Sarnia and Montreal, which are major petroleum refining centres, and in Alberta close to the low-cost natural gas fields. In Canada, as in other parts of the world, there has been a trend to larger, more economic plants and the establishment of chemical complexes. This was to be expected, because in the chemical business each company frequently becomes both a supplier and a customer of another chemical producer. Furthermore, important freight savings can be realized through pipeline deliveries between the plants. Such a centre usually attracts all types of skills and has services and facilities not available to a single plant or smaller installations.

In determining plant location, whether Eastern or Western Canada, various factors must be evaluated: (1) cost of raw material and fuel; (2) cost of transporting products; (3) economics of plant size; and (4) cost of construction. In general, Western Canada has an advantage in cost of raw materials but the cost of transporting products to market in Eastern Canada can offset this advantage. Large-scale operation usually results in lower unit costs and a plant located to serve only a small sector of the Canadian market and scaled to this size may therefore not normally be desirable. Costs of construction are slightly higher in Western Canada because of climatic conditions. These considerations have led to a greater concentration of petrochemical construction in Ontario and Quebec but there are still opportunities for new developments in Western Canada through upgrading of primary petrochemicals to higher valued intermediates and chemical end products on which transportation costs are not as significant a factor.