

owned works at Shawinigan Falls, Que. Aniline for this purpose was imported at first, but at the end of 1941 the Naugatuck Chemicals, Limited, started its manufacture at Elmira, Ont., and in 1942 this Company began production of diphenylamine in a separate Government unit at the same location.

The manufacture of dibutyl phthalate, needed for smokeless powders, was started in 1942 by the Dominion Tar and Chemical Company, Limited, at its Toronto plant and by the Shawinigan Chemicals, Limited, at Shawinigan Falls. The former Company added a unit for phthalic anhydride in the same year and the latter concern a unit for butyl alcohol in 1943. Hexachlorethane, for smoke bombs, was produced by Defence Industries, Limited, at Shawinigan Falls and Windsor.

Most important of all special war projects in the chemical field is the Sarnia plant of the Polymer Corporation, Limited, for the manufacture of synthetic rubber, with its integrated units for making intermediate chemicals such as styrene, butadiene, etc. Erected by the Government at a cost of \$50,000 000 this huge development began operations in the autumn of 1943. In 1948, it was working at capacity to meet peacetime requirements.

Probably the next largest of the Government undertakings was for the production of ammonium nitrate and nitroguanidine at Welland, Ont., in a works which was operated by the Welland Chemical Works, Limited. It came into production early in 1941 and has since been taken over by the North American Cyanamid, Limited.

In addition to the above, mention might be made of the projects to produce cumene, alkylates and other such ingredients of high octane gasolines, and still other expansions to meet the increased demands for basic lines such as carbide, phosphorus, acetylene black, ethyl alcohol, toluol, glycerine and others.

According to records of the Department of Munitions and Supply, the output of military explosives and special chemicals, to the end of 1944, reached a total of 1,500,000 tons.

The major divisions of the heavy chemical industry are treated separately under the following headings:

**Alkalies.**—The alkalies division of the industry is based upon the vast salt deposits which underlie the Windsor-Sarnia district in southwestern Ontario. The salt is brought to surface as brine of which about one-half is evaporated to produce ordinary salt for commercial and table use, the other half is used for chemical purposes.

At Windsor, Ont., the Canadian Industries, Limited, treats brine electrolytically to produce caustic soda and liquid chlorine. Built in 1912 and operated continuously since that date, this works in 1930 added an extension to utilize the hydrogen (which formerly went to waste) in the manufacture of ammonia, this being the first synthetic unit of its kind in Canada. Other lines have been added from time to time, including hydrochloric acid, chloride of lime, ferric chloride, sulphur monochloride, sulphur dichloride and sodium hypochlorite.

To meet the demand of the expanding pulp, rayon and cellophane industries of Eastern Canada, the Canadian Industries, Limited, in 1934, erected a new caustic-chlorine plant at Cornwall, Ont., and, in 1938, opened another unit at Shawinigan Falls, Que. For these projects most of the salt is brought from Windsor, the raw material in this instance being transported to the source of cheap power and to the principal markets for the finished products.