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ments and providing a surplus for export. The industry in Japan is now exceeded only by the dyestuffs industries of Germany, the United States, Great Britain and France.

It is interesting too to observe that carbon disulphide, an essential chemical required in the production of Cellophane and viscose rayon, is now being made by seven plants in Japan and that two more plants are to be built. The question suggests itself whether the time is not approaching when its manufacture might not be advantageously undertaken in Canada, to supply the Canadian requirements now satisfied by imported material.

Canada continues to be the chief producer of the special grade of wood pulp used in the manufacture of viscose rayon and Cellophane. By dint of continuous research carried out here, there has been established and maintained a reputation for uniform quality which has made Canadian pulp for rayon in demand the world over. In view of competition from Finland and other countries, and possibly from pulp prepared from pine in the southern states, it is imperative that research shall be continued, directed to effecting still further improvement and to developing, as it seems possible to do, grades of wood pulp capable of replacing cotton linters for the manufacture of acetate rayon, celluloid, etc.

Some Other Products

Brief reference may be made to a few other clear-cut advances of recent years, involving in several cases the domestic manufacture of products formerly imported. The pure grade of carbolic acid, phenol, used for the manufacture of Bakelite has

been made by the Dominion Tar and Chemical Company since 1930. The manufacture of the newer type of detonating materials for blasting caps, to replace the older fulminating mercury type, has been undertaken by Canadian Industries Limited.

Other instances of new Canadian lines of manufacture in the chemical field are—the manufacture of "dry ice" (solid carbon dioxide); the production of certain grades of dextrin; the manufacture of safety glass, not of the usual sandwich type, but of the new, toughened, flexible type; the manufacture of a wider range of pharmaceuticals, including compounds of iodine, bismuth and potassium. The production of zinc white has been started, although the major

supplies of this pigment are still imported, and other important pigments are also imported (lithopone, another white pigment used in paints and rubber, was imported to the value of \$852,079 in the peak year of 1929).

The establishment during the last decade of the large scale production of insulin—that outstanding triumph of Canadian medical research—should be noted.

An Industry Which Has Suffered

No industry is proof against the possibility of finding the ground cut from under its feet by technological developments elsewhere; it can, however, minimize the risk of such possibility by steadily maintaining research directed to improving its products.

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Calcium Chloride Now Made in Canada

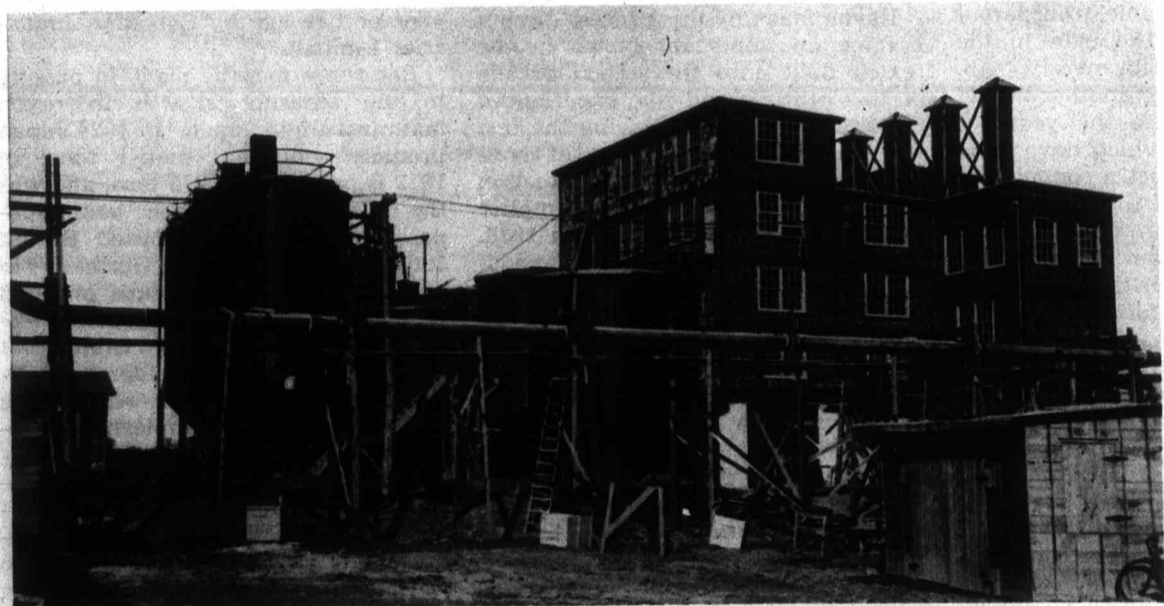
Half Million Dollars Spent on Plant at Amherstburg to Supply Canada's Needs

ONE of the most important of recent developments in Canadian industry has been the completion at Amherstburg, Ont., by Brunner, Mond Canada, Limited, of a new plant for the manufacture of calcium chloride, a product which has always been imported hitherto. The plant is operating in connection with the company's alkali works, which have been running for the past sixteen years, and has sufficient capacity to supply the entire Canadian market for this product.

Approximately \$500,000 has been expended on the new plant and in its construction Canadian labour was employed entirely. Operation of the plant, which has already started, will

further provide permanent employment for an additional force of Canadian workmen.

Calcium chloride has, after many years' experience, proved its superiority in various forms of highway treatment, concrete road construction, ice control and mechanical refrigeration. It has also proved immensely successful in the construction and maintenance of stabilized roads, a new type of low cost gravel road now gaining widespread popularity in the United States. This type of road is a boom to highway departments primarily interested in providing good gravel roads that will carry heavy travel and which may be constructed and maintained at minimum expense.



New plant of Brunner, Mond, Canada, Limited, for the manufacture of calcium chloride, a product not previously made in Canada.

Alcohol and Benzol from Turner Valley

By A. Cambron, B.A., M.Sc., Ph.D.

Division of Chemistry, National Research Council.

The problem of the utilization of the waste gas from the Turner Valley field in Alberta, a waste which is equivalent in fuel value to about 6,000 tons of coal a day, is discussed in this short article by Dr. Cambron. The writer states that the problem of the utilization of the heavier fraction of the waste gas has been solved and that it would be possible to establish a plant capable of producing large quantities of benzol and a number of useful by products.

A NEW organic chemical industry, based on the utilization of petroleum gases such as natural gas, now appears as a distinct possibility as a result of the marked advance in petroleum technology in the last decade, and the development of new synthetic processes. The abundance of the raw material available may result in this industry assuming as great an economic importance as the one based on the products derived from coal tar. In fact, the development of new alloys to withstand the temperatures required and recent improvements in technique have rendered possible the production of aromatics and of ethyl alcohol from petroleum gases, and industry may become independent of coal for such essential products as benzene, toluene and naphthalene and of the sugar cane or the sugar beet for its supply of alcohol.

Natural gas is available in large quantities in the Turner Valley field in Alberta, the daily gas flow being over 270,000,000 cubic feet of which about 160,000,000 cubic feet is being at present wasted. The magnitude of this loss can be better understood when it is realized that this volume of gas is equivalent, in fuel value, to about 6,000 tons of coal.

Turner Valley gas consists of a light fraction, methane, to the extent of about 75 per cent by weight, and a heavier fraction containing ethane, propane and butane, which amounts to about 25 per cent of the gas by weight.

A considerable amount of work is being done on the direct utilization of methane as raw material in organic synthetic processes, but none of these has so far emerged from the experimental stage. This problem, however, will undoubtedly be solved in the near future, and this gas may then become an exceedingly valuable

raw material. The utilization of the heavier fraction, however, is a problem which has been successfully solved, the production of aromatics and of alcohols being commercially possible. The erection of an absorption plant in Turner Valley has made available a considerable amount of this heavy fraction. A pyrolysis plant for the treatment of say 3,000,000 cu. feet of heavy gas could produce 6,000 gals. of benzol per day, at a total cost of 10c per gal., and yielding in addition, as by-products, 1.5 tons of anthracene, 3 tons of naphthalene, 2.5 tons of styrene per day. If the same plant were operated for the production of ethylene, and the

latter converted to alcohol by the sulphuric acid process, as is now being done on a large scale in the United States, there could be obtained, from the same volume of gas, 20,400 gals. of alcohol per day, at an estimated total cost of 15.4c per gallon.

In spite of the attractive figures first mentioned, several factors, such as decreasing well pressures and the uncertain life of the field, render the chemical utilization of Turner Valley gas a doubtful venture. It is possible, however, that the field extends over a greater area than is at present believed, and consequently the probable life of the field may be longer than the present estimates indicate. Provided a supply of gas is assured for a sufficiently long period, the industrial utilization of the waste Turner Valley gases would undoubtedly become a very profitable investment.

Prince Edward Island's New Industries

The Island Province Shows Industrial Progress During Recent Years

By C. L. MacKay

Bruce Stewart & Co., Limited, Charlottetown, P.E.I.

Mr. MacKay, who is a Past Chairman of the Maritime Division, C.M.A., has kindly supplied the following information about recent industrial developments in Prince Edward Island. Even here, in Canada's smallest province, which is devoted so largely to agriculture, there have been encouraging manifestations of industrial growth.

this Company. The Company have done a good business since starting, although profits have necessarily been small, but the future of the industry is bright and the success of the Company seems assured.

The Charlottetown Can Co., Limited, do quite a large and profitable business in the manufacture of cans for the packing of lobsters, vegetables fruit, etc., and export to various parts of Canada, especially the Maritime Provinces.

The Charlottetown Woollen Co. are a new industry started about five years ago. They make woollen blankets, cloth, etc., and are quite busy.

The Royal Packing Co. do a canning business such as baked beans, chicken, soups and fruit. Their baked beans have been sold in other parts of Canada and are well thought of.

There have also been extensions among the potato starch factories during the past five or six years. The low price of potatoes gives these plants a chance to thrive. When potatoes sell for 50 to 80 cents per bushel, the factories cannot afford to purchase them, but when the price drops to 10 to 20 cents per bushel, as is the case at present, the factories get all they want and are able to operate at a profit.

THE Province of Prince Edward Island has experienced certain expansion industrially during the past few years and mention may be made of the following new enterprises.

The Island Fertilizer Co., Limited, established a fertilizer mixing plant at Charlottetown four years ago. They are catering to the farmers of Prince Edward Island and also make some sales outside the province. This is regarded as an important enterprise. Chemicals are brought in from Europe and mixed ready for application on the soil. Farmers are thereby guaranteed fresh ground fertilizer for their land.

The establishment of this plant was one result of the Dominion Government putting a protective duty on mixed fertilizer in 1930, thus giving encouragement to a number of business men in the Province to invest in