

RAPID GROWTH OF CHEMICAL INDUSTRY SHOWN IN REPORT

Over 500 Manufacturers of
Chemical Products Listed
in Directory Just Issued

GOOD PROGRESS MADE

Progress in the chemical industry of Canada is shown in the Directory of Chemical Industries in Canada, as of date January 1, 1919, prepared for the Honorary Advisory Council for Scientific and Industrial Research by the Dominion Bureau of Statistics and issued as a part of the Census of Industry.

The Directory contains a list of over 500 firms manufacturing chemical products in Canada. The following is the number of plants by provinces:—

Nova Scotia	30
Prince Edward Island	2
New Brunswick	20
Quebec	161
Ontario	293
Manitoba	38
Saskatchewan	8
Alberta	21
British Columbia	61

Total

DEVELOPMENT OF THE INDUSTRY.

The growth of the chemical industry in the Dominion is thus summarized in the report:—

The unprecedented demand for explosives and other munitions of war which are the products of chemical change, together with the decreased imports of chemical products from European countries has built up in Canada during the past four years a number of large industries employing thousands of workers, and unless many of these factories can find peace-time uses for their war-time products, much of the advantage we have gained in the way of commercial chemical progress will be lost. Already, many of the plants operated by the Imperial Munitions Board have been closed down, and in some instances dismantled. There remain, however, many plants in the chemical field, which are still operating, and there is room for yet others. Thus a review of what we have is primarily in order, so that we may understand wherein we lack and how best to build up a chemical industry compatible with our general industrial needs.

Progress in chemical industry in Canada can only be made with the co-operation of the representatives of capital supported by popular sentiment. The latter, as a force in the country, is often overlooked. In this regard, Canada may well take a page from the German note-book, as our neighbours to the south have done. In every land, where an industry of national importance is to be built up, the people must be educated to its importance and value. Exemplification of what has just been said is found in an extract from the report made by the Alien Property Custodian of the United States, in which, writing on the subject of "The Chemical Industry," he says: "It seems to have been regarded as the duty of a good German chemist in the United States to preach the doctrine of the invincibility of the German chemical industry, the impossible difficulty of the processes of many important dyes, and the hopelessness of procuring the necessary technically trained men and skilled labour outside of Germany." Canada has listened all too long to just such doctrine, but our successes in the chemical field during the war just closed have done much to instill ideas which lead a vigorous people to the accomplishment of great deeds.

Although we are not a nation of superlatives, we have in some of our resources and industries the "largest" and the "greatest." Possibly the most outstanding development in chemical lines during the war has occurred at Shawinigan Falls, Quebec. Here, on the St. Maurice river, has been constructed one of the largest power reservoirs in the world, second only to the great dam at Gatun. The city that has

HISTORY OF PASSENGER TRAFFIC BY PERIODS

The history of passenger traffic by periods in Canada since 1875 is given as follows in the Railway Statistics Report issued by the Department of Railways and Canals:—

Year.	Passengers carried.	Year.	Passengers carried.
1875.....	5,190,416	1911.....	37,097,718
1880.....	6,462,948	1912.....	41,124,181
1885.....	9,672,599	1913.....	46,203,765
1890.....	12,821,262	1914.....	46,702,280
1895.....	13,987,580	1915.....	49,322,035
1900.....	21,500,175	1916.....	49,027,671
1905.....	25,288,723	1917.....	53,749,680
1910.....	35,894,575	1918.....	50,737,294

grown up at Shawinigan is filled with the workers who are employed in the many and varied lines of endeavour utilizing the great resources of power held in check for the service of man. Here the world's largest glacial acetic acid plant was built for war purposes, an entirely new process beginning with acetylene having been developed. Acetone, paraldehyde, crotonaldehyde, mercuric oxide, and manganese acetate are now also produced. Here, to, magnesium of a purity ranging from 99 per cent to 99.9 per cent is made electrolytically from its fused salts. Aluminium, successfully made at Shawinigan, proved attractive, and now a second company, this time United States owned, has built a plant nearby.

At Niagara Falls, further utilization of the great water-power available has been made, much of it naturally going to power for lighting and heating. Besides this use there has been a further adaptation to the manufacture of fixed atmospheric nitrogen as cyanamide, the lime-nitrogen fertilizer, and its conversion into ammonium salts. Aluminous abrasives, ferro-silicon, and other electric-furnace products are native to Niagara and Shawinigan.

The water-powers of Ontario and Quebec have scarcely been touched as yet, and the magnificent resources of Manitoba and British Columbia in this regard still call their usefulness to a people only beginning to show appreciation of their potentialities. Our development and future in chemical industry do not entirely depend however, upon our utilization of water-powers. These have been mentioned because it is around them that the most spectacular development has taken place.

The demand for acetic acid and acetone, in the manufacture of munitions of war, stimulated the wood distillation industries of the country, and not only was the output of these products greatly increased, but acetic anhydride, methyl acetate, and special grades of acetone-alcohol and acetone oils were added to the list of products.

COAL TAR PRODUCTS.

Coal-tar products, including dyes, medicinals and fine chemicals for photographic and reagent purposes were almost entirely of German origin before the war. In the matter of coal-tar dyes alone, Germany supplied approximately nine-tenths of the world's needs. While it is not probable that we shall see a coal-tar dye industry built up in Canada, such have been started both in Great Britain and in the United States, and, in the course of a few years, it is hoped they will be able to compete successfully in the markets of the world. Some coal-tar medicinals have been made in Canada, and there seems to be a field for this line of work. Salicylic acid and the well-known acetyl derivative, better known as aspirin, are now made in Canada. Coumarin, benzoic acid, benzoate of soda, and benzaldehyde are more names taken at random from the list of new Canadian chemicals. The distillation of coal tar is carried on here more extensively, and new disinfectants, closely resembling former German products, are appearing from Canadian factories. A further use of coal-tar products is in the preservation of wood by creosoting and in the manufacture of tarred felts, as well as

the various grades of tar and pitch used in roofing, paving, waterproofing, and road treating. These products will need considerable advertising in order to bring to the attention of the Canadian people the fact that quantities of these supplies are now produced in this country.

Paints and varnishes are being made in increasing quantities, and at least one new lead-corroding works has been established.

In the field of heavy chemicals, where transportation charges often form the determining factor of costs, each country tends to supply its own needs, and the large quantities required enable the manufacturer to enjoy the benefits of "quantity production," which was so characteristic of the German dye and chemical houses. The demands of the war here led some of our older houses into new lines, for example, the manufacture of oleum for use in the making of high explosives. Several new acid plants have sprung up, and facilities for the production of sulphuric, nitric, and mixed acids have been largely increased. One firm in Canada now produces hydrofluosilicic acid, and still another picric acid. Soda ash, to, now has a Canadian home.

Mention has already been made of the increased production of acetic acid. Great quantities of this acid were used in the manufacture of cellulose acetate, the dope used in varnishing aeroplanes, and the usefulness of this lacquer is only now coming into popular appreciation. One Canadian firm has undertaken the production of lacquers for various purposes, and part of the plant is adapted to the refining of fusel oil and the preparation of amyl acetate.

Molybdic acid, which soared in price during the war, is now made in Canada and its ammonium salt is produced in the same plant.

Chlorates of soda and potash are listed as products of two Canadian firms, one of which also makes phosphorus, and the other produces perchlorates, in commercial quantities.

PROGRESS IN METALLURGY.

In metallurgy, and particularly in electro-metallurgy, much progress has been made. Silico-manganese for use in the manufacture of manganese steel, and high-grade ferro-silicon for the use

of the British Admiralty as a source of hydrogen were new lines developed by one firm as a war-effort. Many new electric furnaces have been installed, and the immensity of the output of steel under the direction of the Imperial Munitions Board is so well known as not to need more than passing mention here. The refining of Canadian nickel in Canada is at last being undertaken, and two large plants are under construction for this purpose. The refining of graphite has been the subject of considerable thought and expense, but so far has not been carried on with commensurate success. One firm expects to commence operations shortly, and another is under consideration.

Not a few still hold the opinion that we must look back to the period before the war as the foundation upon which to base our calculations for the period upon which we are entering. To a certain extent this is true. It must be remembered, however, that many other industries have laid aside their peace-time activities, and that the extent to which they will return to their pre-war production is problematical. The country is filled with new ideas, and cannot ever be just the same again.

It is shown that the imports for consumption of drugs, dyes and chemicals into Canada in the last fiscal year amounted to \$32,788,704, of which \$28,785,191 represents the value of chemical products imported from foreign countries, and \$4,003,513 the value of such products imported from British markets. In the same year, exports of Canadian chemical products to British and foreign countries amounted to \$17,053,074.

FUTURE OF THE INDUSTRY.

The report concludes with the following forecast of the future of the industry:—

"The energy and enthusiasm of the chemists of America is notable, and if manufacturers, representing the financial and natural resources of the country, and chemists, with their scientific training, urging their imagination and initiative, can pool their abilities for the common good, there will be built up in Canada in the years to come a chemical industry to which not only the chemists and manufacturers, but the people will have reason to be proud."

PUBLIC SERVICE OF RAILWAYS OF CANADA

The railways of Canada carried 50,737,294 passengers and 127,543,687 tons of freight in 1918, according to statistics compiled by the Department of Railways and Canals.

Electric Railway Earnings.

The gross earnings of electric railways in Canada during the fiscal year ended December 30, 1918, were \$24,299,889.69, and their operating expenses \$17,535,974.63. The rate of operating expenses to gross earnings was 72.16, as stated in the annual report of the Department of Railways and Canals.

War Savings Stamps not only save money but earn it.

MILEAGE INCREASE ON TRAMWAYS SINCE 1901

The table below shows the increase of mileage of Canadian electric railways since 1901, taken from the annual report of the Department of Railways and Canals:—

MILEAGE.			
First track mileage:—			
1901	*674'58	1910	1,047'07
1902	557'59	1911	1,223'73
1903	759'36	1912	1,308'17
1904	766'50	1913	1,356'63
1905	793'12	1914	1,560'82
1906	813'47	1915	1,590'29
1907	814'52	1916	1,724'71
1908	992'03	1917	1,743'54
1909	988'97	1918	1,616'36

*Including some second track.