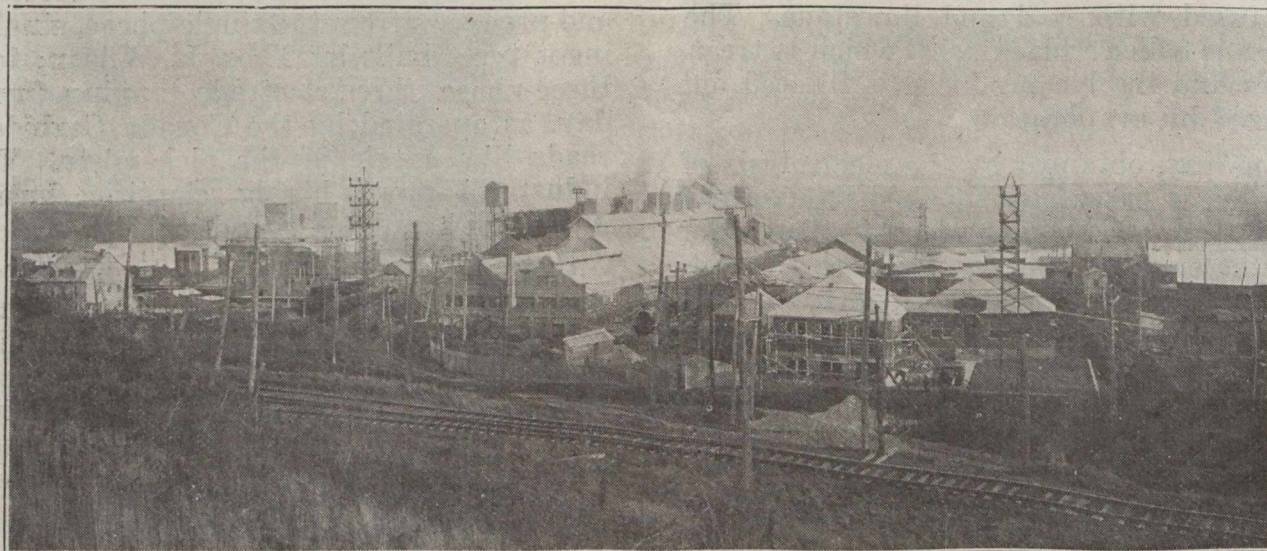


"arately, but in America the higher cost of farm labor, and general convenience, favors the use of ready-mixed fertilizers. Cyanamid-mixtures, as made by fertilizer manufacturers, contain no cyanamid in its original form. The acid phosphate in the mixture changes the cyanamid principally to the neutral and highly available organic compound, urea, and to a slight extent the ammonium compounds. Cyanamid-mixtures as ordinarily made by fertilizer manufacturers are used like any other fertilizer mixture."

In other methods for the utilization of atmospheric nitrogen the nitrogen is converted directly into nitric oxide by the electric discharge and nitric acid is made from this. Prior to 1914 the countries of the world depended chiefly on the Chilian deposits for nitrates as a source of nitric acid so essential in explosives manufacture, but the possible cutting off of this supply by enemy navies was once evidenced in the action of the German Pacific squadron. Practically all countries are now interested in the development of nitrogen compounds from the atmosphere. Canada's water powers give her great advantage in this respect over many other countries.

charge used in shells for the British Army, became so insistent that the possibilities in every source of acetone were investigated to the last detail. The producers of acetone at that time, practically all operating by means of the calcium acetate process, and working to capacity, were quite unable to even approximate the demand. It was one of the big problems the Munitions Boards had to solve and solve quickly. Many expedients were resorted to. A huge plant for producing acetic acid by making vinegar out of molasses was put up in the United States. In California the kelp industry sprang into sudden active life, and another large plant was built out there to produce acetone, among other things, from kelp. The British Acetones, Ltd., making use of an idle brewery in Toronto, began to produce acetone from corn syrup by a fermentation process using the bacillus macerens.

In the fall of 1915, among the first, the Shawinigan Water and Power Company went into the game. They decided to try out the synthetic process for making acetic acid and acetone, from acetylene gas—or to go back the remaining two steps from calcium carbide—from limestone and coke.



*View of the First Plant Erected at Shawinigan Falls in 1916 to Manufacture Acetic Acid. This plant has been increased to twice the size shown.*

Canadian chemists did not shrink from the field of organic chemistry so long and erroneously considered the exclusive field of German chemists.

Since the spring of 1916, we have been making acetyl salicylic acid, familiar to headache sufferers under the name as aspirin. By an oversight or excessive conscientiousness, this registered trade name remained the property of the enemy while the Canadian article has been used the British, French and Russian Governments, and the retail drug trade of Canada in large quantities.

Phenacetin is another German controlled product which is now made in quantity in Canada, and has been put successfully on the foreign market. Other compounds will shortly be produced which have passed the laboratory stage. One of the greatest difficulties in the manufacture of some of these goods is the presence of cunning "jokers" in the German patents, scientific herrings drawn across the trail.

During the summer of 1915 the demand for acetone for the manufacture of cordite, the propulsive

Such a process could only be operated in the vicinity of a carbide plant, and the company already had a large plant—the Canada Carbide Company, in Shawinigan Falls—where large carbide furnaces had been in operation for a number of years.

The services of Mr. H. W. Matheson, a Canadian and a graduate of one of our Canadian universities, at that time with Du Pont Powder Co., were obtained, and in December, 1915 experimental work on a commercial scale was started in a small building under the grim, dusty walls of the Canada Carbide Co.'s plant at Shawinigan. The difficulties of designing and obtaining the special equipment suitable to the work, took time. By the end of May, 1916, there were five Canadian chemists at work there. All five had obtained their training in and were graduates of Canadian universities.

The process finally evolved divides itself into three sections. First, the conversion of acetylene gas into acetaldehyde. Second, the oxidation of acetaldehyde to acetic acid. Thirdly, the conversion of acetic acid directly into acetone. These were