increased cultivation led to the breaking up of considerable new ground, which required fertilization; the chief materials in the manufacture of these products are sodium nitrate, ammonium sulphate and the potash salts. With the transition from an agricultural community to a more advanced industrial stage, centring in the main around the industrialized areas of Ontario and Quebec, various other industries developed, all of which needed chemicals in their processes.

Hydro-Electric Power and the Chemical Industries.—Chemical industries associated in many phases with the use of hydro-electric power have recorded marked growth in Canada in recent years. Owing to Canada's great water power resources and in particular to the fact that many water powers are situated near tidal waters, there is an opportunity in this country for the expansion and establishment of new chemical industries. Electric refining, at first applied to copper only, is now being extended to all the metals, and the electric current is also employed in their extraction from the ores. The production of aluminium, of the abrasives, of new refractory materials and of graphite, have already created large industries. The fixation of nitrogen, with its many subsidiary industries, such as the manufacture of nitric acid, ammonium nitrate, explosives, etc., the reduction of magnesium and the production of innumerable chemical compounds known at present only to the special trades requiring them, are now under commercial development. Noteworthy progress has been made in the output of calcium carbide, which can be readily marketed in countries dependent for their domestic manufacture on electrical energy derived from coal. Exports of this chemical increased in value from $161,000 in 1914 to $2,261,000 in 1922, mainly to the United States. The development of cheap electrical power has contributed to the advance of industries using electro-thermic reactions, the intense heat which it is possible to develop by electrical means being a specially advantageous factor.

Coal Tar Distillation.—Coal tar, accumulated in large quantities in the early days of gas making, was a by-product which, after having been a source of trouble, became of immense value owing to later research. Its only use in the earlier period was in burning under the retorts in the gas plant, where one part could be utilized with about four parts of coke. But the condition was altered by the discovery in distillates from coal tar of a number of important substances used as intermediates for the preparation of explosives, aniline dyes, synthetic perfumes and essences, disinfectants and medicinal preparations. It is now the practice to distil off the lighter constituents, obtaining the valuable intermediates, and to leave the residual pitch or tar of sufficient consistency to be used for all ordinary purposes. Formerly coal tar was obtained chiefly from illuminating and fuel gas manufactures, but the advent and general use of by-product coke ovens has brought about an enormous increase in the output of coal tar, and by far the greater part of the Canadian production is derived from the latter source. In the industry consisting of the distillation of coal tar and the manufacture of commodities such as disinfectants from coal tar and its products, two firms operating in 1920 discontinued in the following year, but the remaining nine firms accounted for 8·5 p.c. increase in the capital investment, in spite of the fact that the total value of the production declined to 58 p.c. of the $2,000,000 output indicated for 1920. The cost of materials in 1921 was $456,000, leaving $727,000 as the value added by manufacturing.

Heavy Chemicals.—The heavy chemicals occupy an important place in among the products of the nation, but it is not often that the utility of these commodities is appreciated by the general public. This indifference is due to the fact that acids, alkalies and salts, the principal products of the industry, are not readily