

The aggregate annual product of these four plants is estimated at 20,000,000 kilograms (20,000 metric tons), capable of generating 6,000,000 cubic meters (211,896,000 cubic feet) of acetylene. Besides these, the Aluminium Industry Company, of Neuhausen-on Rhine, has this year increased its capital to 16,000,000 francs (\$3,088,000) for the purpose of constructing a 7,500 horse-power plant at Land-Gastein, in Austria. All these establishments will employ the original process, by which the lime and carbon are smelted together by the heat of an electric current.

The Walther process smelts the same materials by the heat of darting acetylene flames intensified by mechanical pressure, and is employed by a company at Leipsic, which has works at Cassel. Although this company is said to have exhibited at Berlin carbide samples of very high quality, there seems to prevail among business men some doubt—which may be only the Conservative prejudice that discredits all new things—as to whether this process can be made to compete economically with electrical heat generated by water power under favorable conditions. So far as can be ascertained, a favorably located and well-managed water power plant in Germany or Switzerland ought to produce carbide of standard quality at a net cost of 160 marks (\$38) per metric ton, and it is doubted whether this minimum figure can be much reduced by any process now in practice. The consumption of acetylene will have to increase rapidly after next winter to keep pace with the great augmentation in the carbide supply that will then occur.

There is now in the European market no apparent surplus of carbide, and the current supply is taken up as fast as it is turned out. There is even a demand there that would justify some importation, provided the foreign made carbide were of standard quality and could be furnished at prices within the local market rate and under conditions of delivery and payment that prevail.

This situation can probably not continue beyond the close of the present year. The several large new carbide plants that will be started up next winter and spring will so increase the output as to probably reduce the market price to a fair profit above net cost of production, and, unless the use of acetylene increases phenomenally, leave a surplus that will be available for export.

Calcium carbide is, however, a somewhat critical kind of merchandise for international traffic. The requirements of railways and steamship companies in respect to packing, etc., are so costly and difficult of fulfillment that in one recent case a large order of carbide for China had to be cancelled because it was impossible to comply with the specifications for its transportation.

### THE ENGLISH CHEMICAL TRADE.

Liverpool, England, is the largest chemical center in the world, and the United States has been the best customer. Conditions, however, are rapidly changing. There is a revolution going on in the method of manufacture. Within recent years, the English chemical trade has been meeting with great competition from the Continent, especially from Germany. A still more recent and more significant feature of the chemical trade of the Liverpool district is the falling off in the exportations to the United States—indeed, no other manufacture, with the exception of tin plate, shows such a great decline in exportations to the United States. The following table gives the values of the exportations of chemicals from the Liverpool district to the United States for the calendar years named:

1891 .....	\$8,695,822
1892 .....	8,692,731
1893 .....	7,226,636
1894 .....	5,865,238
1895 .....	6,075,305
1896 .....	4,357,287
1897 .....	3,893,667

During the first six months of 1898 the exportations were \$1,181,529.

The English manufacturers of chemicals concede that the principal reason of this decline of exportation to the United States is owing to the recently established American home industry. At a general meeting of one of the largest concerns (Brunner, Mond & Co.), the president, Sir John Brunner, M.P., referring to the fact that the dividend on the ordinary capital had decreased from thirty to twenty five per cent. as compared with last year, said that the shareholders "were all aware that the company had suffered a very severe loss in their American trade through the operation of the Dingley tariff."

The chemical trade is intimately connected with the salt industry, as salt is by far the most important of the raw materials in the manufacture of chemicals. The county of Chester, immediately south of the River Mersey, produces more salt brine than any other territory in Great Britain, and this fact accounts for the establishment of the chemical industry at Liverpool. In a statistical circular letter upon the Cheshire salt industry, published at the commencement of this year, it was stated:

In 1887 Liverpool sent to the United States of America 169,195 tons of salt; in the year just expired (1897) the total amounted to only 91,723 tons—a terrible decline. It is at all times difficult for England to compete with the salt works of America on their own continent, and this difficulty is turned almost into an impossibility by the fact that the Government of the United States, in the year just concluded, placed upon common salt a duty amounting to 150 per cent. of its cost at the works in Cheshire.

The greater portion of the salt exported to the United States goes over in bags as ballast. The duty under the present tariff is \$1.25 per ton on salt cake, eight cents per 100 pounds on salt in bulk, and twelve cents per 100 pounds on salt in packages. Under the tariff law of 1894, salt cake and salt in bulk and in bags, barrels, etc., were free.

For some years there has been an active rivalry in the production of chemicals from salt by two methods—the Leblanc process and the ammonia soda process. The first stage of the Leblanc process is the decomposition of common salt by the agency of sulphuric acid. In this process there is great waste, and until recently it was very objectionable on sanitary grounds. About forty years ago, the by-product hydrochloric acid was utilized for the manufacture of bleaching powder, the processes for which have been greatly improved upon within the past twenty years. Some years afterwards, the ammonia-soda process was established on a commercial footing in Great Britain and other countries. The new process was made financially successful by the establishment of works in Brussels, and by Messrs. Brunner, Mond & Co., at Northwich, Cheshire,—thirty-three miles from Liverpool. As carried on by this concern, the ammonia-soda process has long yielded the principal article required, at a saving of cost so considerable as compared with the Leblanc process that if the manufacturing exponents of the latter had been confined to the production of soda, they would before now have been driven from the field. It is the utilization of their by-product, hydrochloric acid, for the manufacture of chlorine products—including not only bleaching powder, but chlorate of potash (used for making matches and percussion caps) and chlorate of soda—which has been their mainstay, to such an extent that it is, commercially, quite true to say that in the Leblanc soda industry at the present time, soda is a by product of the manufacture of chlorine products. The utilization of other by-products has been of great service to the Leblanc manufacturer in his fight with the ammonia soda process. Every constituent of every substance employed at every stage is, if not altogether, yet to a very large extent, used in a way to have a market value. Yet, not a few of the houses engaged in the Leblanc process found their profits reduced so much that they dropped out of business.

About the end of the year 1890, there was a combination of