SULPHURIC ACID

Extract from a Paper presented to the Sulphide Staff Society by Mr. PETER R. MEAD.

The first large-scale production of sulphuric acid was carried out by a quack doctor of the name of Ward. This occurred about the year 1740 at a place called Richmond near London.

Ward employed large glass vessels of up to 66 gallons capacity. These vessels were provided with horizontal projecting necks and in the bottom contained a little water. In each neck there was an earthenware pot on which rested a small red-hot iron dish. A mixture containing one part saltpetre and eight parts of brimstone was then placed in the hot dish and the neck of the vessel sealed with a wooden plug. On completion of combustion the plug was removed and fresh air allowed to enter the vessel. The operation was then repeated until the acid had become strong enough to pay for concentrating in glass retorts. Troublesome as it was, Ward's process reduced the price of acid from 2/6 per ounce to 2/- per lb.

A few years later a gentleman called Dr. Roebuck improved on the Ward process by introducing lead chambers. As a result, the expense incurred by the use of large glass vessels was considerably reduced. Dr. Roebuck with his partner Samuel Garbett set up a factory at a place called Prestonpans. The process consisted of placing a mixture of brimstone and saltpetre in iron carts and rolling them into the chambers where the reactions took place. Other works were soon to follow.

The size of the chambers used in these plants was very small compared with the chamber of more modern times, but in number they excelled themselves and one factory in London had 71 cylindrical lead chambers, each 6 feet in diameter and 6 feet high. The total chamber volume of these works was only 12,000 cu. ft. This is small compared with present practice and several units at our Works each have a chamber volume of approximately 150,000 cu. ft.

Meanwhile the price of acid continued to fall as production increased, and it is of interest to recall that about this time the cost of manufacturing in one factory in Glasgow was £32 per ton.

It is not quite clear as to what was the original intention of producing sulphuric acid on a commercial basis, but it is most likely that Roebuck used it in the refining of precious metals, and Ward sold it for the purification of clay used in the English potteries. It was not long after that the acid was used in fairly large quantities for the direct bleaching of linen.

In a small way sulphuric acid had been used for making the aperient Glauber Salts. These salts which are chemically known as sodium sulphate were produced by reacting sulphuric acid with sodium chloride.

The need for improved methods for bleaching linen stimulated industrialists to seek for new expedients. This led to the introduction of chlorine gas and finally bleaching powder.

At the same time the more urgent need for an alternative method for manufacture of alkali resulted in the commercial use of Glaubers Salts in the synthetic alkali industry. Thus the simple reaction of sulphuric acid with sodium chloride, or common salt, opened up a new field of chemical manufacture, the magnitude of which surpassed all others. The commercial production of sulphuric acid made possible the foundation of the synthetic alkali industry. This was the beginning of modern chemical industry, and the part played by sulphuric acid was indeed the star role.

With a strong market for sulphuric acid assured, slow but sure advances