

bicarbonate of ammonia. The only waste product is chloride of calcium.

The reaction is exceedingly simple and easily performed in the laboratory, but its industrial use offers numerous difficulties. Its discovery, or at least the first thought of its industrial application, is due to H. G. Dyar and J. Hemming, who took out an English patent in 1838; they described the outlines and principles very circumstantially, but the apparatus employed very imperfectly. Delauney, who designated Schlosing as the inventor, took out his French patent after the above-named had taken out their English patent. His patent specifications are for the greater part a translation of those of the latter. Probably Delauney only represented the English inventor in France.

Since that time numerous patents have been granted in England and France, and many patentees claimed the discovery of the fundamental reaction itself. Even the first patent taken out by E. Solvay, in 1861, alluded to this principle. The unsuccessful result of experiments explains why it remained so long unknown.

Muspratt, Schlosing, Rolland, Gossage, Deacon and others had busied themselves with this subject before Solvay; a company had been formed in Cheshire, and started works for using the patent of Dyar and Hemming. In 1855, Deacon was experimenting with his own method and that of Gossage in Widness; Bowker erected a factory at Leeds; and Muspratt, who had previously been the first to introduce the Leblanc soda process into England, made manufacturing experiments at a considerable expense in his works at Newton in Lancashire. In France, the *Societe des Salines* of Sommeville, near Nancy, patented Turck's process in 1854; and in 1855 Schlosing and Rolland started their works at Puteaux, which went down again in 1858. In Belgium the first earnest experiment was made in 1842, in the neighbourhood of Vilvorde.

The experimental undertakings were very praiseworthy, but they were all without success, and that too only on account of the practical difficulties which were met with in carrying out the process, and the imperfections of the apparatus employed. Many inventors in France believed incorrectly, as Schlosing's statements clearly prove, that only the laws of that time in regard to the use of salt in chemical works prevented their industry from becoming able to live. In 1863 Solvay took out a patent on his first apparatus. This he employed in an experimental factory near Brussels, and the results were sufficiently encouraging to induce him to start a factory at Couillet, near Charleroi. But before he could succeed in a regular manufacture, numerous difficulties had to be overcome, large capital invested, and the apparatus gradually modified in a considerable degree. At the Vienna Exposition of 1873, Solvay received the diploma of honour (*Ehrendiplom*), to a certain extent an official recognition.