

KARL WILHELM SCHEELE.*

THE APOTHECARY SCIENTIST OF 18TH CENTURY SWEDEN.

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During the eighteenth century, Sweden produced three remarkable men of science, Linnæus, Swedenborg and Scheele. The story of the latter, a poor drug



The Scheele Corner in the Northern Museum at Stockholm.—The arrangement, drawers and boxes are from the pharmacy in Köping, Sweden. Here Karl Wilhelm Scheele did the greater part of his research work and he was also the owner of the pharmacy. The glass retorts and funnels and the case of coin weights were also used in this pharmacy by Scheele. A larger illustration of the drawers and wooden boxes is shown in



Birthplace of Karl Wilhelm Scheele.—Note memorial Stralsund placque on second floor.

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clerk who became one of the world's greatest chemists, forms the subject of this brief article.

Stralsund in Pomerania, now a province of Prussia, but then under Swedish sovereignty, was the birthplace of Karl Wilhelm Scheele, who was born on the 19th of December, 1742. He was one of eleven children, six sons and five daughters, the youngest but one of the sons. The father was a respectable merchant and

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though the possessor of a moderate business was unable to provide more than an elementary education for the members of so large a family. In consequence, Karl, at the age of fourteen was entered as an apprentice to Martin Anders Bauch of Gothenberg, Sweden. In 1765 or eight years after the beginning of Karl's apprenticeship, Bauch sold his business and Scheele entered the store of the apothecary P. M. Kjelkröm of Malmö with whom he remained for three years. Both Bauch and Kjelkröm encouraged Scheele in his studies, allowed time and materials for his experiments, and these two pharmacists deserve grateful remembrance by the profession for their kindness and encouragement of the young apothecary apprentice and the opportunities they gave him for research.

While at Malmö Scheele prepared a paper on tartaric acid which was communicated to the Academy of Science at Stockholm. Through Ander Johann Retzius, the botanist, and Johann Gottlieb Gahn, the mineralogist, this paper was brought to the attention of Bergman, the greatest Swedish chemist of the day, and led to the early recognition of Scheele as a promising young scientist. In 1775 he was elected to the Stockholm Academy of Science, a very unusual honor for so young and hitherto unknown man.



Scheele's Apotheke.

In 1775 Scheele went to Köping, a small town on Lake Mälär, where he became first the manager and then the owner of a pharmacy. The period between 1768 and 1775 was passed partly in Stockholm and partly at Upsala. It was while he was at Köping that most of Scheele's work was done. Although much of his time was engaged in the management of his business, he was also carrying on researches in chemistry and pharmacy, and each year he published one or

more scientific papers containing the results of his experiments.

These papers are models of what an investigator's report should be and reveal Scheele as a master of scientific method and deduction. In each scientific project he carefully planned a series of experiments that led step by step to conclusions that were apparently inevitable and as certain as some fine piece of mathematical synthesis. He never left any hazy or inconclusive points behind him and every compound was both made and unmade (analysis and synthesis) before he concluded his investigation. The whole history of chemistry contains no such record of important discoveries made by one man as this list of achievements:

Tartaric Acid, Citric Acid, Malic Acid, Oxalic Acid, Gallic Acid, Lactic Acid, Mucic Acid, Uric Acid, Benzoic Acid, Glycerin,¹ Milk Sugar, Chlorine, Oxygen and its proportion in

¹ 1930 is the Sesqui-centennial year of the discovery of glycerin.

the atmosphere, Manganese, Permanganates and their relations to the coloring of glass, Arsenic Acid, Copper Arsenite (Scheele's green), Molybdic Acid, Calcium Tungstate (Scheelite), Cyanogen and Prussian blue, Chemical action of light on silver compounds, the basis of our photography.

This is a volume of work that would be remarkable as coming from some great institution devoted to research. Yet it was the work of a poor country pharmacist who was moreover for a considerable part of the time struggling to get out of debt and place his retail business on a sound footing. In this, incidentally, he was successful and in addition to having been a leader in chemical and pharmaceutical research we might also remember that Scheele set a good example to follow in commercial pharmacy.

We are fond of designating notable epochs of human history by the name of the sovereign whose reign was contemporaneous with them. Thus we have the Georgian, the Augustean and the Victorian periods. In Sweden the Gustavian Age, roughly corresponding to the reign of the Gustav III, was one of the most brilliant in Swedish history. Yet in that splendid period when the name of Linnæus, Swedenborg and Bellman were world renowned, Scheele stands out as one of the greatest of Sweden's sons. In the history of chemistry no other man stands above him and but few beside him. Lavoisier, Scheele, Davy and Liebig, are the very first names on the list of the scroll of fame in the history of chemistry. It should be a matter of particular pride to all pharmacists that a country apothecary without university education, without money or leisure, should have made himself one of the greatest, if not the greatest, research chemist of all time.

Scheele's devotion to his darling science shortened his life. His experiments led him to forget fatigue and he often overworked. Work with the poisonous cyanogen compounds also is thought to have assisted in undermining his health. He died, however, from a rheumatic attack brought on by working at night in a cold, draughty laboratory.

He had built up an excellent and successful business and had planned to marry the widow of his predecessor. This he did but on his death bed, for his marriage preceded his death by only two days. He died May 21, 1786.

Scheele's scientific papers have been collected and were translated into English in 1786 by Beddoes under the title of Chemical Essays.

There is no regular biography of Scheele, even in Swedish. The best account of him in English is in Tilden's Famous Chemists, but it is a fragmentary sketch. There is opportunity here for some graduate student in pharmacy, who possesses the necessary literary tastes and inclinations, to supply us with a "Life of Scheele." The research should include the repetition of Scheele's experiments, their interpretation in the light of modern chemistry and their expression in modern chemical symbols and equations. Sweden in the Gustavian Age, and the notable contemporary figures in science, and literature could be used to add to the coloring of the picture.

The 79th annual meeting of the AMERICAN PHARMACEUTICAL ASSOCIATION will be held in Miami, Fla., during the week of July 28th, 1931—Columbus Hotel is Headquarters. Local Secretary, G. H. Grommet.