

the story behind the story

Cornelis Drebbel and Oxygen

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Joseph Priestley is usually associated with the discovery of oxygen in 1774. Nowadays it is generally recognized that Scheele should be credited with this discovery (1). Furthermore, Lavoisier's experiments on oxidation led to the evolution of the "New Chemistry" as we know it today. Yet some of these chemists were not the first who prepared oxygen from its compounds or who studied its properties. Almost two centuries earlier it was a Dutchman Cornelis Jacobszoon Drebbel (1572–1633) who prepared oxygen by heating salpeter, a method still used today in secondary schools. Drebbel is not credited with the discovery of oxygen probably due to the fact that he spent only part of his life as an alchemist and made no experiments with the gas. He described his preparation in his book "Of the Nature of Elements" (such as Fire, Water, Etc.) (2). Figure 1 is an illustration of the pyrolysis of salpeter printed in his book. The only reason why he wanted the formed "air" (gas, oxygen) was to use it in a submarine which he invented (Fig. 2). In this way Drebbel was able to remain under water for longer periods. In 1615 while in the employ of the Royal Navy his oxygen filled submarine was rowed, submerged, by 12 men on the Thames from Westminster to Greenwich over a period of three hours (3, 4). Supposedly King James I was in the boat.

Drebbel was mostly a technologist and inventor rather than scientist. He was too practical-minded to spend a great deal of time philosophizing on "the nature of air". If he had con-



Figure 1. Pyrolysis of salpeter (reference (2)).



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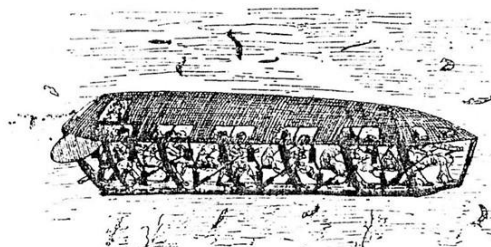


Figure 2. Drebbel's submarine (reference (4)).

tinued to investigate the air (gas) which was so essential for human survival in his submarine, the phlogiston theory, which was to dominate most of the 18th century, would never have been developed. Oxygen, the important gas for theoretical and practical chemistry, would have been discovered a century and half earlier.

Drebbel, who had a laboratory in King James's Eltham Palace, was also a member of the court of Rudolph II in Prague, in the company of such distinguished men as Tycho Brahe, Johannes Kepler, Michael Mayer, Philippe de Monte, Jacobus de Kerle, and Charles Luyton. There he worked in alchemy, not in order to make gold, but as a practical chemist dealing with the distillation, crystallization, and sublimation of useful substances (5). This work probably explains why mercury compounds and silver fulminate were ascribed to Drebbel. He found also a tin mordant for combining scarlet with cochinal. This mordant came into use and was later considered to be so important by Boyle, to call Drebbel in 1660 "a famous mechanician and chymist." Drebbel also succeeded in producing sulfuric acid by the oxidation of sulfur with salpeter, and this method was generally adopted in England (6). These were many practical contributions but Drebbel had no influence on theoretical chemistry.

Literature Cited

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Niels Bohr's Flight to Great Britain

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The editor of this Feature recently (1) appealed for more first-hand accounts of the "story behind the story." The lack of such accounts encourages authors to supply "corroborative detail, intended to give verisimilitude to an otherwise bald and unconvincing narrative" (2). The results are likely to be stories of the same event that diverge as widely as the following do