## Jan Swammerdam
## 1637-1680

Swammerdam was born in 1637 in Amsterdam, the son of an apothecary. His father possessed a collection of curiosities containing minerals, plants and animals. Young Swammerdam helped his father to take care of this collection. In 1661 Swammerdam matriculated at the University of Leiden to study medicine, contrary to the desire of his father who wished him to study theology. In Leiden he studied with Johannes van Horne and Franciscus dele Boë, Sylvius. His fellow students, among whom Frederik Ruysch, Reinier de Graaf, and Niels Stensen, were already impressed by Swammerdam's own collection of insects.

In 1663 Swammerdam went to France, to study under Tanaquil Faber at the Protestant university of Saumur. A year later he attended the scientific academy of Melchisedec Thévenot in Paris, to carry out experiments and to study Cartesian theories. After his return to the Dutch Republic in 1665, Swammerdam became a member of the 'Collegium privatum Amstelodamense', a group of physicians who performed dissections and published their researches. In 1666-1667 Swammerdam again studied at Leiden, performing dissections of insects and working together with Van Horne on the anatomy of the uterus. In this research, Swammerdam used sophisticated wax injection techniques and single-lens microscopes made by Johannes Hudde. Because of a priority conflict with De Graaf, the results of this work, *Miraculum naturae*, were not published until 1672. In 1667 Swammerdam received his MD under Van Horne on a dissertation on the mechanism of respiration (*De respiratione usuque pulmonum*).

After obtaining his doctorate, Swammerdam concentrated mainly on the study of insects, although he suffered from bad health and regular bouts of depression. These were apparently caused by the continuing pressure from his father to earn a living and by continuous religious doubts. In 1669 he published his *Historia insectorum generalis ofte Algemeene verhandeling van de bloedeloose dierkens*, a study of insects based upon his collections and observations in France and around Amsterdam. The purpose of Swammerdam's work on insects and other lower animals was to refute the Aristotelian idea that these were imperfect animals, by systematically contradicting the Aristotelian arguments that they lacked internal anatomy, originated by

spontaneous generation, and developed through an abrupt metamorphosis. The *Historia* dealt only with the problem of metamorphosis. According to the nature of their transformation, Swammerdam divided the insects in four separate groups. In 1675 he published his work on the mayfly, *Ephemeri vita of afbeeldingh van 's Menschen Leven*, which was interspersed with religious poetry and hymns to the Creator. By this time, because of a religious crisis, he had already fallen under the spell of Antoinette Bourignon, a French mystic who had a group of followers in the Netherlands. She permitted Swammerdam to publish his study because of its religious content. Later Swammerdam took up his biological studies again, albeit embedded in devotional purposes. In the late seventies his health worsened. He died in 1680 in Amsterdam.

Swammerdam left a large collection of manuscripts containing drawings of anatomical dissections of all kinds of lower animals and accompanying explanations. Through the care of Herman Boerhaave, these were published posthumously, in 1737-1738, as *Bybel der Natuure*, with text in Latin and Dutch on facing pages. It was translated into German in 1752 and English in 1758.

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[L.C.P.]