

## The Chylous Vessels. Depart Without Liver, Wayfarer!

*Los vasos quilíferos. ¡Vete de aquí, sin hígado, caminante!*

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In ancient times, there was some reference to chylous vessels by Herophilus of Chalcedon and Erasistratus of Ceos, both belonging to the school of Alexandria in the 3rd century BC. It was only until the Renaissance that the topic was mentioned. Gabriele Falloppio (also Gabrielle Fallopa) (Modena, 1523-1562) and Bartolomeo Eustacchio (also Eustachio) (Rome, 1520-1574) were the first to introduce a vague reference on the topic. Eustacchio, a staunch supporter of Greek medicine, described the thoracic duct in his work “*De vena azygos*”. He also described the valve at the junction of the inferior vena cava and the right atrium, which was named after him.

Notwithstanding this background, the presentation of chylous vessels as a system is due to Gaspare Aselli (also Asello) (Cremona, 1581-circa 1626). On July 23, 1662, Aselli discovered the chylous vessels in a dog. The finding was purely incidental. In the vivisection of a recently-fed dog, while observing the recurrent nerves—together with his friends A. Tadino and S. Settala—, Aselli found some white cords, which he immediately assumed to be a novel finding. However, when the experiment was repeated on a fasting animal the following day, the presence of chylous vessels was not confirmed. Aselli immediately realized that the finding was associated with the postprandial period. Therefore, by reproducing the first experience he confirmed his assumption, and called them “*lacteals*”. Aselli, who was a professor at the University of Pavia, left a manuscript on the subject, “*Lectiones de Venis Lacteis*”, in which he also described the venous valves of the chylous vessels, which he called “*quartun vasorum genus*”; this research study, “*De lactibus, sive lactis venis, quarto vasorum mesaraicorum genere novo invento*”, was published posthumously by his friends A. Tadino and S. Settala in Milan in 1627, and included the first illustrations published in color.

However, Aselli, in line with Galen’s theory, thought that the outflow of chylous vessels occurred in the liver, which is essential for blood formation. This work, launched a year before the stunning publication of William Harvey’s “*De Motu Cordis*”, was criticized by Harvey (did the brilliant Englishman consider his theory of blood circulation threatened?) and by Gaspar Hoffmann, a great connoisseur of Galen, and author of “*Comment in Galen de Usu Partium*” (1625).

Later on, Jean Riolo (1577-1657) confirmed

the description of chylous vessels, but also in animals. The discovery in human beings was made by an anatomy enthusiast, Fabrice de Peiresc (French, 1580-1637) around 1634. In that same year, Johann Vesling (1598-1649), a famous professor in Padua, confirmed the previous experience, but still repeating Galen’s errors regarding the central role of the liver. Nicolaes Pietersz Tulp (Dutch, 1593-1678) was also one of the first to describe the chylous vessels. His figure was immortalized by Rembrandt (Dutch, 1606-1669) in his famous painting “*The Anatomy Lesson of Dr. Nicolaes Tulp*”.

Jean Pecquet discovered the thoracic duct; he was born in Dieppe in 1622 and died in Paris in 1674. He wrote “*Experimenta nova*” in 1651. In 1647, not yet qualified as a physician, while dissecting a dog, Pecquet found by chance the termination of the thoracic duct at the place where it opens into the subclavian vein; by following its course, he described the chyle cistern that would later be named after him. In his own words: “*I had removed the heart of a dog and placed it on a table. I was thinking of nothing but counting the systoles and diastoles which the last efforts of its spirit produced, when I perceived a white substance like milk flowing from the ascending vena cava into the pericardium, at the point already occupied by the right ventricle of the heart. I found that this substance—which, by taste, odor, color and consistency, could be compared to the milk or chyle I had seen flowing out of the lacteal veins— came from the subclavian branches in which I found, a little above the jugular veins, the orifices through which this milky fluid penetrated into the vena cava.*”

Thus, by demonstrating the actual path of the chyle, the liver was dethroned as the essential organ of blood formation, a fact that was hailed by the Danish Thomas Bartholin (1616-1680) with an epitaph that read: “*Stay, wayfarer. Enclosed in this tomb is one who hath entombed very many, the liver, known to the ages, but unknown to nature... So long he digested, until with his bloody tyranny himself, he digested away. Depart without liver, wayfarer! And concede bile to the liver, that without bile will thou wayst digest for thyself. Pray for him.*” The description of the thoracic duct in human beings was carried out by Jan van Horne (Dutch, 1621-1770), which was published with illustrations.