

# Adam Christian Thebesius' Channels into the Human Heart:

the Thebesian Veins and the Thebesian Valve

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*In 1708, Adam Christian Thebesius, a 22-year-old student at Leiden University, presented his graduate thesis, Disputatio medica inauguralis de circulo sanguinis in corde. More than a doctoral dissertation, this groundbreaking work opened new channels into the study of the human coronary venous system. Thebesius' theory about the vascular communication between the coronary arteries and the chambers of the heart helped to advance understanding of hemodynamic principles and to clarify the physiologic pathways of the coronary circulation. The following article—the third in a trilogy about Lower Silesian scientists—provides an overview of the life story and achievements of this Silesian physician and innovator, whose name was immortalized in 2 cardiac eponyms: the Thebesian veins and the Thebesian valve. (Tex Heart Inst J 2019;46(3):175-8)*

**T**his article, the third in a trilogy dedicated to prominent Lower Silesian scientists,<sup>1,2</sup> provides a glimpse into the life of Adam Christian Thebesius (1686–1732) and his role in clarifying the physiologic mechanisms of the human coronary circulation.

## The Thebesian Heritage

The first mention of the Thebesius family dates to the 15th century.<sup>3</sup> This aristocratic family, whose unique coat of arms featured a gryphon, was well known throughout the Central European region historically described as Silesia. The Thebesius family included numerous members who held important posts and practiced respected professions, particularly physicians and pastors. Johann Thebesius (1500–1552), who in 1523 became the prior of the Augustinian Monastery in Zagan, is the first known representative of the family. Inspired by Martin Luther's ideas, this ancestor eventually became a pastor of the Protestant Church in Letnica, in the Zielona Góra region of modern-day Poland.<sup>3-10</sup> Nearly 2 centuries later, the Thebesius family welcomed its most renowned member, whose scientific contributions would shape the course of modern cardiology.

## Early Years

Adam Christian Thebesius (Fig. 1) was born in 1686, in Sądowel (formerly known as Sandewalde), a small village in the western region of present-day Poland, to pastor Adam Ludwig Thebesius and his wife Eva Rosina (née Hertel). His formative years were marked by various experiences that would eventually culminate in his roles as a town physician and scientific pioneer. Adam Christian began his studies at age 5, at a school in Goldberg (now Złotoryja), where his maternal grandfather Christian Hertel was an urban councilor. Four years later, Thebesius relocated to Liegnitz (currently Legnica), where his father was a deacon at the Saints Peter and Paul Church. His years of study at the School of Princes in Legnica, where Thebesius focused on humanistic subjects, were marked by a traumatic event: the death of his mother. In 1700, Thebesius moved to Breslau, the capital of Lower Silesia (currently Wrocław, in Poland), where he enrolled in the prestigious St. Elisabeth Gymnasium, with plans to explore theology, philosophy, and philology. In 1704, Thebesius left Lower Silesia and began studying philosophy and medicine at the University of Leipzig. Two years later, when the entire area was engulfed by the Great Northern War, through which Sweden sought to maintain its supremacy as the leading power in the Baltic region,

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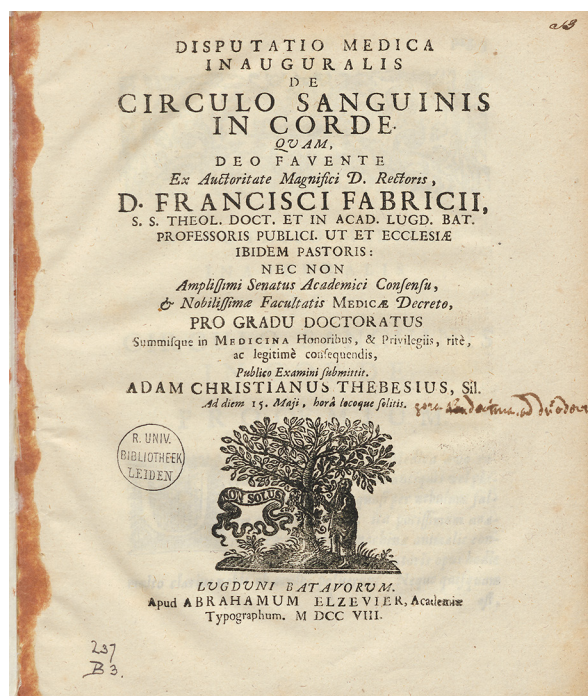


**Fig. 1** Portrait of Adam Christian Thebesius (1686–1732). Photo courtesy of The Karkonosze Museum, Jelenia Góra.

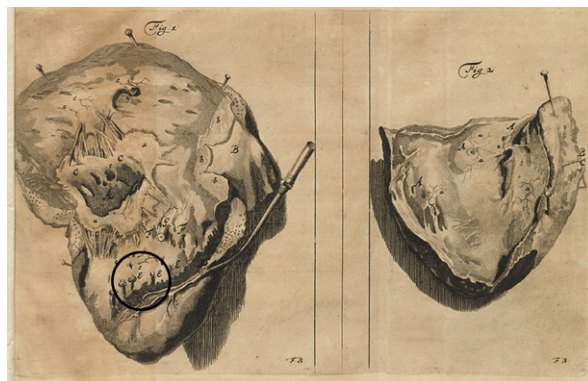
Thebesius relocated to Halle, Germany. A year later, he transferred to Leiden University in Holland, where he studied anatomy and performed autopsies as a student and, later, as an anatomy instructor.

### New Insight into the Coronary Circulation

When Thebesius graduated from Leiden University in 1708, he published his anatomy dissertation, *Disputatio medica inauguralis de circulo sanguinis in corde*<sup>11</sup> (Fig. 2), in which he described the morphology and function of the venous valves, including the valve of the coronary sinus (later named the Thebesian valve). In the same work, Thebesius described the smallest cardiac veins of the coronary circulation system, the *venae cordis minimae* (later named the Thebesian veins), which, as Thebesius showed, drain into the chambers of the heart (Fig. 3).<sup>11</sup> An illustration that accompanies the text shows a cross-section of the heart. Thebesius had wondered why the Creator placed these small vessels in the cardiac walls. In his dissertation, Thebesius wrote, “Thank God for the ingenious device of coronary ventricular channels, which relieve the myocardium from the coronary blood and thus prevent accumulations of interstitial fluid.”<sup>11</sup> In Thebesius’ work, we also find one of the earliest descriptions of atherosclerotic lesions



**Fig. 2** Cover page of Adam Christian Thebesius' dissertation. Lugduni Batavorum, 1708. Courtesy of the Leiden University Library.



**Fig. 3** Illustrations of a heart in Thebesius' dissertation. The cross-section of the heart (left) enables viewing of the Thebesian veins (marked with letter E). Courtesy of the Leiden University Library.

of the coronary arteries, which he speculated were the cause of death in a patient whose autopsy he had performed. Thebesius was the first physician to hypothesize that atherosclerotic lesions in the coronary arteries, which he called “ossification,” may have been the cause of death in some patients.<sup>11</sup>

### Contemporary Theories and Controversy

Two years before Thebesius’ dissertation was published, Raymond de Vieussens, the royal physician to French King Louis XIV, provided a detailed anatomic description of the cardiac vessels in his work, *Nouvelles décou-*

*vertes sur le Coeur* (New discoveries on the heart).<sup>12</sup> In one experiment, Vieussens ligated the superior and inferior caval veins and the pulmonary veins and injected saffron dye dissolved in alcohol into the coronary arteries. The injected dye followed the anticipated route through the coronary sinus into the right atrium, but Vieussens was surprised to discover that the dye also flowed directly into the right and left ventricles. This phenomenon led Vieussens to the hypothesis that small channels in the walls of the atria and ventricles, which he labeled *ducti carnosii* (fleshy ducts), connected the coronary arteries to the cardiac chambers.<sup>12</sup>

Two years later, Thebesius mapped the same vessels and classified them according to size and number. While Thebesius was writing his anatomy dissertation, he became familiar with Vieussens' publications. He referred to Vieussens' experiments in his work, but criticized his technique as containing methodologic errors and rejected Vieussens' speculative conclusions. Thebesius sought to improve Vieussens' method by changing the direction of the injection (that is, he injected water and, subsequently, air and colored liquids mixed with wax and glue through the coronary sinus). Vieussens' compatriots accused Thebesius of plagiarism. Nevertheless, Thebesius' work was subsequently recognized as influential in establishing the morphologic concept of the coronary circulation.

Today, the myocardial vessels that connect to the cardiac chambers are known as the Thebesian veins.<sup>11-13</sup> In 1927, Joseph Wearn published a report that acknowledged the role of the Thebesian vessels in the cardiac circulation.<sup>14</sup> In addition to summarizing previous experiments and results of studies on the coronary circulation, Wearn described the results of his own 3-year study carried out on human hearts, coronary arteries, and veins.<sup>14,15</sup>

### The Many Roles of Thebesius

To this day, Thebesius' innovative doctoral dissertation, which brought him fame and was published in several editions, is considered his most valuable work. With recognition came opportunity: Thebesius was offered a full-time position as lecturer of anatomy at the University of Leiden, in recognition of his expertise in the physiology of the coronary circulation. Unfortunately, Thebesius could not take advantage of this offer.<sup>3-11</sup> In February 1708, pastor Adam Thebesius died in Legnica, prompting his 22-year-old son to return to his homeland to support his family in this difficult time.

Adam Christian Thebesius would never return to Leiden. He settled in Hirschberg (currently Jelenia Góra), a town in the Lower Silesian region, close to the Karkonosze mountain range. Proximity to the Warmbrunn (now known as the Cieplice Health Resort) enabled Thebesius to lead a peaceful existence. His private practice, where Thebesius treated the poor for free, had

a continuous influx of patients. In 1713, Thebesius was offered the post of town physician in Jelenia Góra. The candidate to this prestigious position, who was confirmed by the city council, had to meet stringent requirements. Among those, the town physician was expected to have an impeccable reputation and extensive medical education. The municipal authorities entrusted the 28-year-old Thebesius with this role. For nearly 20 years, Thebesius organized the health care system in Jelenia Góra and managed various health issues that affected the local population. His leadership played a pivotal role during natural disasters, which periodically decimated the population in the area. During his time in Jelenia Góra, Thebesius also served as physician at the nearby health resort in Cieplice, and he performed extensive research, including autopsies.<sup>3-11</sup>

In April 1711, Thebesius married Johanna Regina Glafey, 7 years his junior, the daughter of a wealthy merchant. The couple's happiness was short-lived. Johanna died 7 years later at age 25, leaving Thebesius to raise their children. Two of them, named Adam Christian for their father, died in early childhood. One of the surviving sons, Adam Gottfried, became a pastor of the Protestant church, following in his grandfather's footsteps. His brother Johann Ehrenfried embraced the medical profession and, like his father, became the town physician in Jelenia Góra. Thebesius' only daughter, Johanna Regina, married a merchant.<sup>3-11</sup>

### The Thebesian Legacy

Thebesius was a modest, hard-working man who kept an open mind. His broad interests, which transcended anatomy and physiology, included poetry writing and star-gazing in his self-constructed observatory. He kept up a lively correspondence with many other scientists. Thebesius published multiple works as a member of the Imperial Academy of Sciences Leopoldina (known as *Akademie der Naturforscher Leopoldina* in German and *Academia Naturae Curiosorum* in Latin), which he joined in 1713.<sup>3-6</sup>

In November 1732, Thebesius died at the age of 46. The cause of his death was pneumonia, which he had developed as a complication of asthma, a condition that was passed down from generation to generation in the Thebesius family and that had affected the scientist for many years. Thebesius was buried in the Evangelical cemetery at the Church of Grace in Jelenia Góra. Today, cardiologists around the world associate his name with 2 cardiac eponyms: the Thebesian valve and the Thebesian veins. Until recently, Jelenia Góra, where Thebesius spent more than half his life, had no public reminder of the influential physician. In 2012, the Jelenia Góra council decided to dedicate a street to the memory of Thebesius, the first-ever landmark to bear his name. The address plate on a recently constructed building, which displays the words "1, Adam Thebesius Street,"

reminds passers-by of the relatively short but memorable presence of this illustrious scientist in Lower Silesia.<sup>3-11</sup>

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