

### Al-Nafis and Servetus

*To the editor*

I very much appreciated Abdel-Halim's article about Ibn Al-Nafis and his contribution to medicine and urology.<sup>1</sup> Al-Nafis was certainly a great physiologist and physician, and is rightly credited with the discovery of the pulmonary circulation.

Michael Servetus (1511-1553) was the first writer in Christian Europe to describe the pulmonary circulation, although because Servetus was burned as a heretic along with his books, for many years it was Realdo Colombo (1516-1559) who was credited with the discovery. Both Al-Nafis and Servetus were neglected by Harvey when he applauded Colombo as his forerunner.<sup>2</sup> However, I would disagree with Abdel-Halim that Servetus included Al-Nafis' description of the pulmonary circulation "verbatim" in his book, *Christianismi Restitutio*. The implication is that Servetus plagiarised Al-Nafis, whereas in fact, both men almost certainly described what they had found in their own anatomical investigations. The idea that Servetus copied Al-Nafis derives from a comment by Haddad and Khairallah in 1936,<sup>3</sup> who noted the "striking parallelism" that both descriptions were published within a theological discourse, and also that they "made the same mistakes in practically the same phraseology." It is highly unlikely that this is the case, partly as one wrote in Arabic, and the other in Latin. More importantly though, each described very different reasons for their understanding of the pulmonary circulation. Al-Nafis realized, contra Galen, that the interventricular septum was too thick to allow blood flow, and that instead the pulmonary artery must connect in the lungs with the pulmonary vein. Servetus observed the difference in color of blood in those vessels, and that the pulmonary artery was too large merely to provide nourishment for the lungs themselves.<sup>2</sup>

In addition, although Al-Nafis did recognize that there were "perceptible connecting passages" between artery and vein, it was Servetus who first unequivocally described capillaries (in the lung and the choroid plexus), using that very word: "a new kind of vessels... hairlike [capillaribus] arteries... woven together very finely... the termination of arteries."<sup>4</sup> Nothing can detract from Al-Nafis' position as the discoverer of the pulmonary circulation, however, for all his other faults, Servetus was not a plagiarist. He made the same discovery, independently although much later. And we should not detract from Servetus' distinction as the first writer clearly to describe capillaries.

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*Reply from the Author*

I would like to thank Dr. Giles Cattermole for his comment. I do agree with him on the distinguished status of Servetus in the history of medicine during the 16th century. Certainly, he was one of the greatest physicians of his time. In our paper<sup>1</sup>, the review of the evolution of knowledge on pulmonary circulation was never meant to accuse him of plagiarism; a scholar of his calibre and character is never expected to plagiarize. On pulmonary circulation and on capillaries, Servetus, in his great work *Christianismi Restitutio* (1553), presented what he accepted of the knowledge already available at his time. Early in the 16th century, Andrea Alpago (1450?-1522), a professor of Medicine in Padua University who spent 30 years in Damascus studying Arabic Medical manuscripts, translated into Latin sections of Ibn Al-Nafis' Book *Sharh Tashreeh Al-Qanun* including his views on the pulmonary circulation. This translation, printed in Venice in the year 1547, helped to spread Ibn Al-Nafis' description of pulmonary circulation to Medieval European scholars and, thus, raise their doubts on Galen's anatomy. According to Ullman, "Servetus' presentation of the lung circulation resembled Ibn Al-Nafis' so strongly that one can hardly reject a direct influence".<sup>5</sup> Ullman, in his comparative study quoted the text of both authors, the Latin text of Servetus and the English translation of Ibn Al-Nafis' description. Many other authors came also to the same conclusion.<sup>1</sup> It is also well documented that Servetus was an expert in Arabic language<sup>6</sup> which he mastered during his university years in Toulouse.<sup>7,8</sup>

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