

# Some comments on Jorink's 'Swammerdam, hoveling?'

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## ABSTRACT

In this paper a reaction is presented to an earlier article, published in *Studium*, devoted to the reputation of the 17<sup>th</sup>-century microscopist Johannes Swammerdam (1637–1680). It is argued that the picture sketched in that paper by Eric Jorink has some interpretations which can be questioned in the light of the available historical sources.

*Keywords:* Johannes Swammerdam, Antoni van Leeuwenhoek, Regnier de Graaf, Eric Jorink, comments

In his recent article, *Swammerdam, hoveling? Enige kanttekeningen bij de reputatie van een wetenschappelijk onderzoeker* (in English: 'Swammerdam, the courtier? Some comments on the reputation of a scientific researcher'), Eric Jorink has an interesting and valuable argument about the character and historical reputation of Jan Swammerdam (1637–1680).<sup>1</sup> He was not, as his reputation may have it, a mystical hermit (*mystieke kluizenaar* – p. 174). Unwilling to work as the physician he was by training, Swammerdam needed a network and a patron to be able to do his insect research full time. Because he was in the early 1670s 'the only top researcher in Europe who was involved with the microscope' (p. 188), the article contends that: 'Here was his claim to fame, and potentially the key to patronage' (p. 192).<sup>2</sup>

This claim to fame was challenged by his rival and erstwhile colleague Regnier de Graaf (1641–1673). Beginning in the early 1660s, De Graaf and Swammerdam, along with Nicolas Steno (1638–1686), were students and researchers in Leiden and Paris. With their teacher Jan van Horne, they closely examined the male and female sexual organs. For the next decade,

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1 Eric Jorink, 'Swammerdam, hoveling? Enige kanttekeningen bij de reputatie van een wetenschappelijk onderzoeker', *Studium* 8:4 (2016) 173–197.

2 My translation of passages from the article.

the three jockeyed for primacy. Who 'discovered' what? How could they prove it? How would disputes be settled? The story of Van Horne and his students and the key role played by the brand-new Royal Society is complex enough to be beyond the scope of this article and this response. For a fuller account, see Matthew Cobb's 2006 book *The egg & sperm race. The seventeenth-century scientists who unravelled the secrets of sex, life, and growth*.<sup>3</sup>

'Swammerdam, hoveling?' focuses on the dispute over who first saw the follicles in a human female's ovary. In March 1672, De Graaf published *De Mulierum Organis Generatione Inservientibus*, which described the follicles without taking credit for discovering them, but without giving Swammerdam the credit that Swammerdam believed he deserved. As Jorink's article notes, 'the debate was not ultimately about the priority of the discovery (De Graaf also never claimed this), but about honour and decency' (p. 191). It was also about Swammerdam's reputation and ability to attract a patron. In his own defence, Swammerdam immediately published a rebuttal in April 1672.

The following April, De Graaf responded with *Partium genitalium defensio*. Under a cover letter, he sent the book to the Royal Society along with a letter from 'a certain most ingenious person', a neighbour in Delft. Birch's *History of the Royal Society* noted that on 7 May 1673, 'Mr. Oldenburg produced a book of Dr. de Graaf dedicated to the Society, intitled, Regneri de Graaf *Partium Genitalium Defensio*, together with a letter to Mr. Oldenburg, dated at Delft in Holland, 28th April, 1673, communicating some microscopical observations of Mons. Leeuwenhoek'.<sup>4</sup>

Jorink contends that by introducing Leeuwenhoek to Henry Oldenburg and the scientific world, De Graaf 'smothered [...] in the bud' Swammerdam's ambitions to find a patron.<sup>5</sup> Nevertheless, the article notes, a year later, in 1674, Swammerdam turned down a repeated offer from Cosimo III de' Medici, Grand Duke of Tuscany, exactly the patronage that De Graaf had, obviously unsuccessfully, tried to forestall. Instead, Swammerdam followed his interest in religion and lived for a short time from late 1675 to early 1676 in a commune run by the religious mystic Antoinette Bourignon.

By early 1676, Van Horne had died (1670), De Graaf had died (1673), Steno had become a priest (1675), and Leeuwenhoek was beginning the six-month series of observations of infusoria that would lead to his world-wide fame. In 1678, Swammerdam's financial problems were solved when his father died. Swammerdam himself died in February 1680, two weeks before Leeuwenhoek was elected a member of the Royal Society, a status achieved by none of the others.

Jorink continues: 'In retrospect it seems the fame of Van Leeuwenhoek is self-evident; few have considered the possibility that Van Leeuwenhoek was put forward as a pawn in a conflict' (p. 193). Now that I have considered it, I find it plausible. Many a mentor has encouraged a newcomer in such a way that it would also help the mentor's career, especially if it was at the expense of one of the mentor's rivals. Many young researchers – in April 1673, De Graaf was 31 years old, Swammerdam was 36, and Leeuwenhoek was 40 – have jockeyed

3 Matthew Cobb, *The egg & sperm race: the seventeenth-century scientists who unravelled the secrets of sex, life and growth* (London 2006, 2007<sup>2</sup>), Translated into Dutch as: Matthew Cobb, *De ei- en spermarace. Hoe zeventiende-eeuwse geleerden de geheimen van seks, leven en groei ontraadselden* [vertaald uit het Engels door Meile Sniijders] (Amsterdam 2006). In the USA the book was issued with the title: *Generation*.

4 Thomas Birch, *The History of the Royal Society of London, for Improving of Natural Knowledge*, vol 3 (London 1757) 88.

5 Jorink, 'Swammerdam, hoveling?' (n. 1) 192.

for career positions. The article claims that 'Swammerdam was framed' (*geframed*), a word usually referring to a victim of false accusations due to a conspiracy. No one falsely accused Swammerdam of anything. Perhaps 'outmanoeuvred' would be a more accurate description.

Later in 1673, both Swammerdam and Leeuwenhoek had letters excerpted in volume 10 of the *Philosophical Transactions*. Two pages after the extract from Leeuwenhoek's April 1673 letter that De Graaf had forwarded, Oldenburg published in one article two extracts from letters that Swammerdam had written in January and March of 1673. Swammerdam's reputation had not been ruined in Oldenburg's eyes. Jorink continues to discredit De Graaf's character. He notes that De Graaf's son was much later accused of forgery after suggesting that 'probably' De Graaf was guilty of such behaviour himself. The letter forwarded by De Graaf, probably conceived (and perhaps even written) by him, reported that Leeuwenhoek's investigations included the bee and the louse. 'The choice of the subjects could hardly be coincidence: it was precisely the matters that Swammerdam was trying to present' (p. 192).

Indeed, it was not a coincidence. It was on purpose, but it may have had nothing to do with De Graaf's directing his new protégé to jump ahead of rival Swammerdam. In this first letter, Leeuwenhoek replicated and extended several of Robert Hooke's observations in the *Micrographia* (1665) in the same order: mould, the stinger of a bee, and the head of a louse. That could hardly be a coincidence, either. Swammerdam's published 1673 letters were about the veins in animals' lungs. In 1675, he had his second and last article in *Philosophical Transactions*, about 'an un-usual rupture of the mysentery'. Swammerdam's observations of the bee and louse were not published until fifty years after his death. I do not know whether he sent those observations to the Royal Society in 1673 and whether Oldenburg did not publish them because Leeuwenhoek had already observed the same things. However, even if De Graaf wrote Leeuwenhoek's first letter, De Graaf died four months later, so Leeuwenhoek must have written the subsequent two hundred letters. Between Swammerdam's only two letters in *Philosophical Transactions*, Oldenburg published extracts from half a dozen of Leeuwenhoek's letters. In one of these, letter no. 6 of 7 September 1674, Leeuwenhoek wrote to Oldenburg, referring to his dissection of a cow's eye:

Two or three small pieces of this crystallin body I have fixed to several pins of two microscopes, which I have put among other microscopes, for showing them to curious Gentlemen upon occasion; not being satisfied to see such things myself alone, but very willing to present others with the same view; although I have already found more than once, that some have made their particular advantage by it.<sup>6</sup>

Leeuwenhoek's next paragraph discussed Swammerdam. It is unclear whether Swammerdam was one of those who Leeuwenhoek felt took advantage of his openness:

Dr. Swammerdam hath again within this fort-night visited me twice, accompanied with a Gentleman, to both which I have shew'd many of these Microscopical Observations, and of such others as I had formerly spoken to him about; perceiving that his speculations are busy upon this subject, and that probably he will discourse more largely of it than I have done hitherto.<sup>7</sup>

6 English translation from *Alle de Brieven van/Collected Letters of Antoni van Leeuwenhoek*, vol. 1: 1673–1676 (Amsterdam 1939) 143.

7 *Ibidem*.

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Thus, only a year after De Graaf introduced Leeuwenhoek in order to damage Swammerdam's career, Leeuwenhoek was deliberately helping Swammerdam build on his (Leeuwenhoek's) research. Perhaps the following sentence refers to Swammerdam, too:

Though I liberally communicate my observations, I daily experience more and more that some are altogether incommunicative as regards their considerations, nay, do not scruple to point out my mistakes. In this respect I lately experienced a very painful treatment. I had shown to some persons the tendon of a muscle which I took for a nerve (not being versed in anatomy), as I did not know that there is a difference between the tendon of a muscle and a nerve. Mr. Schravessande, Ordinary Doctor of Anatomy, Councillor of this town, has now instructed me in this matter. But let this be confidential and in parentheses!<sup>8</sup>

Swammerdam wanted more from Leeuwenhoek. He wrote to his friend and patron Melchisedec Thévenot on April 28, 1678: 'It is impossible to go into discussion with him [Leeuwenhoek], as he is biased, and reasons in a very barbaric way, having no academic education.'<sup>9</sup>

The point seems to be that Leeuwenhoek, compared to Swammerdam, was not worthy of the attention he was receiving. In support, Jorink paints an unnecessarily negative and inaccurate portrait of Leeuwenhoek. For example, he gratuitously calls Leeuwenhoek a *kamenier*, a term that usually refers to a female servant, seeming to perpetuate the inaccurate idea that Leeuwenhoek was a janitor for the city of Delft, doing a woman's work. In fact, he was a magistrates' court official (*kamerbewaarder*) who got a substantial salary as well as a generous allowance every year for the robes (*stede kleding*) that he wore during the bi-weekly court sessions and in ceremonial processions. Leeuwenhoek got a separate allowance to pay the janitor, not do the janitor's work of maintaining the magistrates' fireplace. He even picked up some extra money when the magistrates occasionally appointed him to curate insolvent estates, hardly work to be entrusted to a janitor. Leeuwenhoek did exactly what the article says that Isaac Beekman and De Graaf did: he found a paying job to subsidize his research.

Jorink's article notes the three areas where, in hindsight, historians have distinguished Leeuwenhoek from his peers and found him wanting:

- (1) 'This amateur microscopist spoke no foreign language and was unfamiliar with the important scientific works of his time'. Indeed, Leeuwenhoek *says* in some of his early letters that he knew only Dutch, but that was also modesty.<sup>10</sup> Van Seters has shown that Leeuwenhoek most likely received a basic education in Latin at his school in Warmond.<sup>11</sup> And Damsteegt demonstrated that Leeuwenhoek very well understood the broad outline of the English language.<sup>12</sup> Not surprisingly, as Leeuwenhoek not only had worked

8 Ibidem, 145.

9 G.A. Lindeboom, *The letters of Jan Swammerdam to Melchisedec Thévenot* (Amsterdam 1975), #.

10 See for instance *Alle de Brieven/Collected Letters* 1 (1938), letter no. 2 (15 August 1673): 'I have not been brought up in languages or arts, but in trade'; letter no. 20 (22 January 1676): 'but I must tell you that I regret I do not understand any language but Dutch and when you write to me in French or Latin I can help myself all right, since I have enough friends who will translate it for me; but I cannot help myself with the English language since the death of a certain gentleman who was proficient in this language'.

11 W.H. van Seters, 'Can Antoni van Leeuwenhoek have attended school at Warmond', in: L.C. Palm & H.A.M. Snelders, *Antoni van Leeuwenhoek, 1632–1723* (Amsterdam 1982) 3–12.

12 B.C. Damsteegt, 'Language and Leeuwenhoek', in: Palm & Snelders, *Antoni van Leeuwenhoek* (n. 11) 13–28. See also: idem, *Alle de Brieven/Collected Letters*, vol. 14 (1996) 327, note 10.

five years for the Scottish merchant William Davidson in Amsterdam, but also had an English family-in-law.<sup>13</sup> But certainly, in 1673, new to the world of scholarship, he was not as familiar with the scholarly literature as he would be as his career developed.

- (2) He 'practiced microscopy purely as a hobby.' An 'amateur hobbyist' would seem to contrast with a professional. But in the seventeenth-century Netherlands, everyone engaged in what we now call science was an amateur because no one was getting paid for it. As the article notes, either they had family wealth or patrons, as did Christiaan Huygens and Simon Stevin, or they worked for pay. Leeuwenhoek, son of a basket maker, was a city official. De Graaf, son of an architect, was a professional physician. Swammerdam, son of an apothecary, practiced medicine only when his father or a patron would not subsidize him. Beekman, son of a candle maker, became rector of Dordrecht's Latin school. Not having had the foresight to be born into money, all of them made money at something other than science in order for them to do their science. What then made Leeuwenhoek more 'amateur' in that sense than Swammerdam? The success of the Dutch Golden Age was due in part to the porous nature of its class structure. In contrast to the countries that were its commercial rivals, that suppressed intellectual talent among the lower classes, the Dutch Republic nurtured and rewarded it. Leeuwenhoek is a leading example, along with engineers, military commanders, and many others.
- (3) 'Leeuwenhoek – unlike De Graaf and Swammerdam – was not operating from a well-defined conceptual framework'. It is not clear how De Graaf and Swammerdam benefited from having, and Leeuwenhoek suffered from not having, a well-defined conceptual framework. Leeuwenhoek was a pioneer. De Graaf and Swammerdam confined their observations to the macro world of anatomical organs in humans and insects for which the conceptual framework went back to Aristotle and Descartes. Both De Graaf and Swammerdam used microscopes, but they used them to look more closely at little things he could already see. While Leeuwenhoek used his lower-powered lenses to better see that macro world, he used his higher-powered lenses to discover a microscopical world that no one had even imagined before. No one had a well-defined conceptual framework for what he found in that world. He was driven by questions, not theories.

When Leeuwenhoek died, Linnaeus was a teenager. It was another century before cell theory was developed. Germ theory followed that. Pioneers as far ahead as Leeuwenhoek build their own structures with fresh eyes; they do not live in someone else's. The framework that Leeuwenhoek did use in 1673 – Descartes's mechanical philosophy – he shared with Huygens, De Graaf, and Swammerdam. It stood him in good stead in the macro world, but it led him astray in the micro world, for example, in his seeing 'globules' so often.

Jorink explains what happened to Leeuwenhoek after his reputation eclipsed Swammerdam's. The son of a craftsman was transformed within a few years to an internationally renowned and wealthy man, honoured by princes and scholars, decorated with honours and memberships in prestigious institutions such as the Royal Society, and owner of hundreds of microscopes, often made of silver, several houses, a wig and a horse.

<sup>13</sup> Leeuwenhoek married in 1654 to Barbara de Mey, daughter of Elias de Mey a cloth merchant from Norwich (England), living in Delft.

In fact, Leeuwenhoek's wealth was more extensive than indicated in Jorink's article. He stayed active as a researcher for more than forty years, acquiring the fame and fortune noted above. The fame came from his microscopic work. The fortune came from his civic jobs and his investments.<sup>14</sup> All that came later, long after Swammerdam's death. In 1672 and 1673, the focus of this article, Leeuwenhoek was just another researcher with a single-lens microscope. In terms of any effect Leeuwenhoek had on Swammerdam's reputation in 1672 and 1673, it is not relevant who Leeuwenhoek became ten or twenty years later or how worthy the 'formidable competitor' was that De Graaf introduced. Nevertheless, the article claims: 'Considered in the long term, this action by De Graaf was by far the most damaging to the reputation of Swammerdam'. How could the introduction of another microscopist have caused so much damage?

Thanks to convenient public relations of Van Leeuwenhoek himself and of others, the man from Delft would become the embodiment of microscopic research during the scientific revolution, and often erroneously be regarded as the inventor of the (simple) microscope. While Swammerdam's contributions were important, he was an active researcher for less than two decades, 1664 to 1680. In quantity and quality, his contributions pale next to Leeuwenhoek's. Does not Leeuwenhoek's fame rest on half a century of what the article calls being 'very adept at manufacturing microscope lenses and thus perceiving amazing things'?<sup>15</sup> Apparently not. Jorink states: 'Had De Graaf had not introduced Van Leeuwenhoek to the Society, the Delft chambermaid (*Delftse kamenier*) with his amazing lenses would probably (*waarschijnlijk*) have remained a local curiosity, and not have had an acclaimed career but have quickly been forgotten' (p. 193). The article offers no evidence for 'probably'. As it turned out, Leeuwenhoek was driven by his own sustained curiosity. He had learned how to make small lenses with higher magnification than anyone ever had. In his cover letter, De Graaf noted, 'Mr. Leewenhoek hath lately contrived microscopes excelling those that have been hitherto made.'<sup>16</sup> He was not the first to use a tiny lens for scientific observations, but he did design and make unique and delicate devices to hold the specimen very close to the short-focal-length lens. In addition to De Graaf, Leeuwenhoek was close to at least two other men – physician and neighbour Cornelis 's Gravesande and *stadhuis* colleague Anthonie Heinsius – either of whom could have functioned as De Graaf did to introduce him to the wider world. Living five miles from Delft, Constantijn Huygens, the Republic's leading intellectual, was always on the lookout for new talent. Before long, he would have heard about the high-powered lenses in Delft. It wasn't a question of whether or not Leeuwenhoek would have begun to communicate his observations to the natural philosophers of Europe. It was a question of when. Perhaps De Graaf's introduction of Leeuwenhoek was less a matter of De Graaf's trying to harm Swammerdam's reputation and more a matter of De Graaf's recognizing a genius. Yes, Leeuwenhoek was obsessive and self-taught, not formally exposed to the credentialed elite's old ways of seeing and doing. These characteristics serve geniuses well.

To summarize the part of the article that relates to Leeuwenhoek: in the early 1670s the ethically challenged Regnier de Graaf damaged Jan Swammerdam's reputation and career

14 See 'How Prosperous was Leeuwenhoek?' <http://lensonleeuwenhoek.net/content/how-prosperous-was-leeuwenhoek>. Accessed 19 September 2017.

15 Jorink, 'Swammerdam, hoveling?' (n. 1) 192.

16 *Alle de Brieven/Collected Letters*, vol. 1 (1939) letter 1 (28 April 1673).

prospects (1) by neglecting to credit him for being the first to describe the egg follicles in an ovary and then (2) by being the only reason why the monolingual, uneducated but clever and industrious Leeuwenhoek became rich and famous, eclipsing Swammerdam as the world's preeminent microscopist of the seventeenth century. I see no evidence in this article, or anywhere else, to support that second claim. 'The image has since been very positive about the industrious man from Delft, at the expense of Swammerdam' (p. 193). As it should be.

*Note by the editors*

As customary in these cases, the author of the first article, Eric Jorink, has been offered the opportunity to write a response. However, on this occasion he has declined our offer.