Galileo, Simon Marius and Dutch nationalism

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Abstract
In 1898 the Dutch *Hollandsche Maatschappij der Wetenschappen* issued a prize question asking for an evaluation of Galileo's charge of plagiarism laid by Galileo against Simon Marius concerning the discovery of the satellites of Jupiter. The only submission defended Galileo, and the editor of the Society's journal, Johannes Bosscha (1831-1911), then took it on himself to defend Marius and attack Galileo, whom he saw as a usurper of the credit rightfully belonging to the Dutch engineer and scientist Simon Stevin (1548-1620). Bosscha's extreme nationalistic arguments are analyzed in this paper.

Keywords
nationalism, Anthonie Conrnelis Oudemans, Antonio Favaro, Johannes Bosscha, Jupiter satellites

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> The injuries caused by an immoderate admiration, one would almost say the cult of which Galileo has been the object, take on particularly serious character when, in order to hide the weaknesses of the "divine philosopher," they are attributed to those whom he denounces as his adversaries.
>
> Johannes Bosscha (1907)[1]

While engaging with "Lothario Sarsi" in *Il Saggiatore* Galileo took on some of his old adversaries, among whom Simon Marius (Mayr in German, 1573-1624), the court mathematician of the Duke of Brandenburg. Marius had twice crossed Galileo's path; first as the tutor of Balthasar Capra, the purported author of a Latin version of Galileo's book on the proportional compass, and again when Marius published his *Mundus Iovialis* in 1614. In that work he claimed to have seen the moons of Jupiter in November 1609, well before Galileo, and to have started observing them on 29 December of that year, ten days before Galileo's first sight of three of the satellites, as shown in the *Sidereus Nuncius*. Galileo had not reacted to Marius's publication, but now he decided upon an aggressive response to the claim.

Galileo first told his readers that Marius had made stealthy use of the Julian calendar: on the Gregorian calendar Marius's first observation was made on 8 January, one day after Galileo's first observation. This point was perhaps not as important as Galileo made it out to be: most if not all readers recognized that Marius had used the Julian calendar throughout his book, as was to be expected in Protestant Ansbach, where the shift to the Gregorian calendar would happen only in 1700.

Second, Marius had stated that the orbits of the satellites were inclined to the ecliptic; Galileo argued that they were, in fact, parallel to it. On this point both were in error, as later astronomers would show.[2] But the inclinations did determine where the moons would be seen above, below, or on the ecliptic.[3] Here, Galileo could correctly point out that Marius had given the wrong prediction for the period 1611-1613. *Mundus Iovialis* contained only a handful of observations; while Galileo's argument was seen by later generations of astronomers as damning, at the time it had little impact. But this evidence did bring up another point: not how many observations of the moons Marius had made, but had he made them at all? Galileo thought not. But here, in retrospect, he went too far: there is

1 Bosscha, "Simon Marius. Réhabilitation d'un astronome calomnié", 262.

2 The angular inclinations of Jupiter to the ecliptic and of the satellites to Jupiter's orbital plane are very small.

3 OG, VI, 214-217; Galileo, *Il Saggiatore*, 98-101, 467.

solid evidence that Marius did indeed observe the moons a number of times. However, the first known observation of his is dated 30 December 1610.[4]

What did other astronomers think of Marius's claim? As Galileo's correspondence shows, upon the publication of *Mundus Iovialis* Galileo's supporters, his patron Federico Cesi, chief among them, urged him to write to Johannes Kepler, the Imperial Mathematician, who had enthusiastically supported Galileo's first telescopic discoveries. Either Galileo never wrote such a letter, or Kepler did not answer it. But Kepler could hardly comment on Marius's claim: he had mocked that astronomer and his observations in the preface of his *Dioptrice* and had been forced by Emperor Matthias to apologize to him.[5] Marius had not responded graciously.

Galileo's adversary in the sunspot debate, Christoph Scheiner, could, however, speak freely. He dismissed Marius's claim, called him a usurper and a Calvinist, the latter an especially forceful insult among Catholic writers. His fellow Jesuit Giovanni Battista Riccioli did not comment on the priority dispute, and Johannes Hevelius later simply stated that Marius had discovered the moons shortly after Galileo.[6] Christiaan Huygens, suspected of having stolen the idea of his pendulum clock from Galileo, wrote to a correspondent that he hoped Prince Leopold and his fellow academicians did not think that he had "claimed the invention of others and that he resembled that Simon Marius".[7] Giandomenico Cassini noted that, judging from the details in *Mundus Iovialis*, it was clear that Marius had indeed observed the moons, but he did not further take sides.[8] In the eighteenth century Jérôme Lalande merely mentioned Simon Marius as the discoverer of Jupiter's satellites and the Andromeda nebula.[9] But Jean-Baptiste Joseph Delambre, reserving final judgment, concluded "It seems to us that one could write everything that Marius has given us, without ever having seen anything of the satellites other than in Galileo's book".[10]

Except for some writers in German-speaking regions, little attention was paid to Marius's claim until the rise of nationalism in the nineteenth century. In *Kosmos* (1845-1862), his influential, multi-volume study of culture and science, Alexander von Humboldt broached the subject of the discovery of the satellites of Jupiter by suggesting that they had been discovered, "as it would appear" [*wie es scheint*], almost simultaneously, and quite independently, on the 29th of December, 1609, by Simon Marius, at Ansbach; and on the 7th of January, by Galileo, at Padua. In the publication of this discovery, Galileo's, *Nuncius*

4 Nikolaus Vicke to Johannes Kepler, 16 July 1611, in Kepler, *Johannes Kepler Gesammelte Werke* (hereafter JKGW), XVI, 382-383.
5 Kepler, *Dioptrice* (1611), in JKGW, IV, 354. Translation by Roger Ceragioli.
6 Hevelius, *Selenographia*, 45.
7 Huygens to Ismael Boulliau, 14 May 1659, in Huygens, *Oeuvres*, II, 404.
8 Cassini, *Les hypotheses*, 39.
9 Lalande, *Astronomie*, I, 200 (§ 488).
10 Delambre, *Histoire*, I, 703.

Sidereus (1610) preceded the *Mundus Jovialis* of Simon Marius (1614).[11] Von Humboldt had his doubts about Marius's claim. In a note, he cited François Arago's proposal that priority of publication should be taken by the scientific community as priority of discovery. And he found it peculiar both that Kepler had never given Marius credit for this discovery, and that Marius had not claimed the discovery either in his *Fränkischen Kalender* for 1613, written perhaps as much as a year earlier, or in any of his letters before 1614.

Humboldt thus posed the priority question to all who read his work and who were interested in this topic. Prominent among these were Antonio Favaro (1849-1922), who sided with Galileo in his *Galileo e lo Studio di Padova* (1883),[12] and Johannes Bosscha Jr. (1831-1911), a pioneer in the introduction of thermodynamic principles in Dutch physics, and as Secretary of the *Hollandsche Maatschappij der Wetenschappen*, a towering figure in the promotion of science in the Netherlands during the onset of the so-called second Golden Age of Dutch science.[13] Bosscha was of the generation of scholars who took a deep interest in the history of Dutch science, especially that of the first Golden Age (the seventeenth century), and he played a leading part in the publication of a complete edition of the works of Christiaan Huygens, personally editing five volumes of the correspondence.[14] When it came to advocating and defending the historical claims of Dutch scientists, Bosscha could, in the words of Hendrik Lorentz, "burn with youthful indignation if in life or in the history of science he discovered an instance of injustice or usurpation".[15] And although he conceded that in science *unde habeas nemo quaerat sed oportet habere*,[16] he argued that

> … as long as humanity is divided into nations, whose reason and right to existence is determined by what they contribute to the progress of the human family, and whose reputation and prosperity depends partly on this, so long the just recognition of that which is deserved by each nation will be as important as the promotion of national science is dutiful.[17]

Bosscha had a special regard for Simon Stevin (1548-1620), an older contemporary of Galileo, whose many contributions to science and engineering included dropping balls from a height in 1584 and proving Aristotle's notion of fall wrong – before, as Bosscha

[11] Humboldt, *Kosmos*, II, 357.
[12] Favaro, "Polemiche intorno ai Satelliti di Giove", 419-449.
[13] The phrase "second golden age" of Dutch science' was introduced by Willink, "Origins of the Second Golden Age of Dutch Science after 1860", 503-526; Id., *De Tweede Gouden Eeuw*.
[14] Van Berkel, "Natuurwetenschap".
[15] Lorentz, "Prof. Dr. J. Bosscha", 73-75, at 75.
[16] Juvenal, *Satira*, 14, 207: "No one asks where you got [your money], but have it you must". See: https://www.loebclassics.com/view/juvenal-satires/2004/pb_LCL091.475.xml
[17] Lorentz, "Prof. Dr. J. Bosscha", 74-75.

argued – Galileo did so. In 1905, Cornelis de Waard discovered the *Journael* of Isaac Beeckman (1588-1637), which contained material by Simon Stevin, one of the heroes of Dutch science in the Golden Age. Arguing for its publication, Bosscha asked:

> If today, somewhere in a forgotten corner of some library, an unknown work by Galileo were found, the entire learned world would demand its immediate publication. Should we in the Low Countries then be in doubt when in Beeckman's *Journael* a work by Simon Stevin is found – a man who if he is judged not by public renown but by the real progress achieved by his works – must certainly be placed above Galileo?[18]

Far above Galileo! In his pursuit of the heroes of Dutch science, Bosscha had become a sworn enemy of Galileo. As E. J. Dijksterhuis wrote, Bosscha's statements about Galileo "in general show a tendency to minimize his achievements, which seem hardly compatible with impartiality".[19] Bosscha also did not accept Hans Lipperhey as the inventor of the telescope because he was not Dutch, but German, preferring the Dutchman Sacharias Janssen.[20] Quite in character, he did not approve that young Cornelis de Waard, the expert on the problem of the invention of the telescope, gave both Giambattista Della Porta and Galileo important roles in the development of the instrument, writing,

> It is not inconceivable that you will get some applause, just as eager as superficial, from some Italians […] You do well, when it comes to favors and not the truth, to think that there are better reasons for seeking those of Mr. Bosscha than those of foreigners.[21]

Bosscha chose Simon Marius as his means of undermining Galileo's reputation. In a footnote to the letter from Huygens, cited above, Bosscha, editing this volume of the *Oeuvres Complètes*, wrote of Marius:

> Since his time he has been taken as a plagiarist of Galileo, who on several occasions defended himself against him. According to recent research his error was rather publishing his works in books that were little known or published too late, so that the priority escaped him.[22]

[18] "Programme de la société hollandaise des sciences a Harlem pour l'année 1906", *Archives*, ser. 2, vol. 11 (1906), xxvi.

[19] Dijksterhuis, "Galilei en zijn Strijd", 112.

[20] De Waard to Favaro, 8 September 1906, see Favaro Correspondence at the Thek@Favaro: https://teche.museogalileo.it/favaro/index.php/it/materiale-manoscritto

[21] *Ibid.*, letter no. 6729: De Waard to Favaro, 31 August 1906.

[22] Huygens, *Oeuvres*, II: 404, note 4.

Favaro, a corresponding member of the *Hollandsche Maatschappij der Wetenschappen*, received this volume, and as we will see the footnote did not escape his notice.

What was the research to which Bosscha gestured? He had asked the Leiden astronomer Ernst Frederik van de Sande Bakhuyzen (1849-1918) to check the details of Galileo's argument in *Il Saggiatore*, to compute the longitudes and latitudes of Jupiter's moons in the first reported observation by Galileo in January 1610, and to examine Marius's tables to see if the latter were better than what Galileo had produced by 1614. Bosscha's letter does not survive, but Bakhuyzen's brief report does.[23] It contained calculations of the places of the four Galilean satellites in their orbits and the formations of the satellites as seen from the Earth on five dates between 1 November 1609 and 10 January 1610 (N. S.). For these, Bakhuyzen used tables and information published by Cassini (1693), Lalande (1771) and Delambre (1821). Bakhuyzen did not check how well Marius's tables correlated with the observations of January 1610; indeed, he gave no information about Marius at all. The absence of evidence is no evidence of absence, but Bakhuyzen's results certainly could not be used in Bosscha's campaign.

But Galileo had to be taken off his pedestal, and Bosscha chose the discovery of the satellites of Jupiter as his point of attack.[24] In 1898 he therefore posted a prize question in the *Archives néerlandaises des sciences exactes et naturelles,* the official journal of the *Hollandsche Maatschappij der Wetenschappen*, with a deadline of 1 January 1900:

> A comparative and critical study is requested of the observations relating to the satellites of Jupiter mentioned in the *Nuncius Sidereus* of Galilei and the *Mundus Jovialis* of Simon Marius. We want to determine to what extent the accusation of plagiarism, brought by Galileo against Marius, may be considered well founded. (See Humboldt's *Kosmos*, II, 357).[25]

To suggest that the satellites were merely "mentioned" in the *Sidereus Nuncius* was a startling choice of words. And Bosscha offered no further specifications about what a "comparative and critical study" might entail.

If Bosscha expected many submissions for the prize, he was disappointed. There was only one, and it argued that Galileo was justified in his charge that Marius was a plagiarist. This 235-page essay, was written in a difficult German script by Joseph Klug (1862-1925), *Gymnasialprofessor*, first in Würzburg, and from 1902 at the *Royal Gymnasium* in

[23] Van de Sande Bakhuyzen to Bosscha, 8 August 1891, AHMW, no 455.

[24] This priority dispute has been discussed earlier by North, "The Satellites of Jupiter" and Vanin, "On Simon Mayr's (Marius)".

[25] "Programme de la société hollandaise des sciences a Harlem pour l'année 1898". *Archives*, ser. 2, vol. 2 (1899), 6; De Bruijn, *Inventaris*, no. 1137.

Nuremberg.[26] Klug began by laying out the history of the problem, describing Galileo's discovery of Jupiter's satellites, the publication of the *Sidereus Nuncius*, Marius' publications, Marius's character, and Galileo's accusations of Marius's plagiarism.[27] Klug also reviewed the reactions of astronomers from the seventeenth to the nineteenth century to the controversy. In part II he analyzed Marius's writings: his correspondence, his annual prognostications from 1609 to 1613, and his reliance on information gleaned not only from Galileo's *Sidereus Nuncius*, but possibly also from letters such as Galileo's letter to Prague about the phases of Venus,[28] and the more than hundred predictions of the satellite positions Galileo would publish as an appendix to his third sunspot letter.[29] All this information, Klug argued, formed the basis of Marius's claim in his *Mundus Iovialis*. Marius could have obtained the few observations he discussed in his book from material published by Galileo, Klug stated, but that was of course, not proof, or even evidence, that he had done so. The parallel with the Dreyfus affair, where the argument was that the accused officer could have written the spy report and therefore that he *must* have done so, was actually pointed out in one of referees' report.[30] Since Klug's essay, finally published in 1906, is easily available at the digital Marius Portal we will limit ourselves to this brief description.[31]

How did the *Hollandsche Maatschappij* go about judging Klug's essay? Bosscha studied the manuscript for some time, making negative comments in the margins. In response to the first sentence of the manuscript, "Galilei, der Begründer der wissenschaftlichen und experimentellen Mechanik…". ("Galileo, the founder of scientific and experimental mechanics…."), for instance, Bosscha underlined *Wissenschaftlichen* and commented "not so he did not understand it at all, because he did not know the law of inertia". In his view, then, Galileo's work was not scientific.

After spending a month with the manuscript, Bosscha sent it out for refereeing, proceeding as follows. The first page was removed, presumably because it contained the author's name. With a cover letter, it was then sent to the first referee, the earlier mentioned Ernst Frederik van de Sande Bakhuyzen, who sent it on, with his report, to the next referee, Jacobus Cornelius Kapteyn (1851-1922) in Groningen, who in turn sent the package, including his second report, to the third referee, Jean Abraham Chrétien Oudemans (1827-1906), director of the Utrecht observatory. Bosscha instructed the referees to read

26 Folkerts, "Klug, Joseph".

27 AHMW, no. 1137. Although the title page of the manuscript is missing because it was removed by Bosscha before the entry was sent out for refereeing, its title was presumably the same as a later published version.

28 Galileo to Giuliano de' Medici, 11 December 1610, in OG, X, 483.

29 OG, V, 241-245.

30 The referee's reports are preserved with Klug's essay in AHMW, no. 1137.

31 www.simon-marius.net. See also Gaab, Leich (eds.), *Simon Marius and his Research*.

Galileo's accusation in *Il Saggiatore* carefully and then "to consult the *Sidereus Nuncius* and the *Mundus Jovialis*, and to decide whether the writer comes to his judgment on objective grounds". He explained:

> The question was posed by me because I had made quite a study of it and expected that someone else would not only do the same, but would also make his results known, something for which I could not find the time. The writer says, in fact, very little that is new. In reading the paper, I have made some remarks in pencil in order to orient myself somewhat in this long piece, and also a few times to vent my impatience, but by no means in every place where this would have been appropriate or where I had comments.[32]

Bosscha thus offered no indication of his true motives. Time was short, and Bosscha wanted his referees to concentrate only on the astronomical core and to skip everything else, no matter how uneasy they might feel about it. He continued:

> The exceptional length of the answer, 235 pages in folio, in German and in German script, makes judging it very difficult, so that it will be burdensome to get it done before the April meeting of the directors. The difficulty is not a little increased by the many details that the writer treats. Strictly speaking, the referees do not have to concern themselves with these. They merely have to read carefully Galileo's accusation in *Saggiatore* […] to consult the *Sidereus Nuncius* and the *Mundus Jovialis*, and to decide whether the writer comes to his judgment on objective grounds. What other have written about these [details] is not relevant, other accusations, suspicions, characterizations even less because they lead to the opposite of what is meant by the question: an *objective weighing* of the judgment of Galileo. The referee will feel himself nevertheless somewhat *unheimisch* when he is urged to leave everything involved in the case and is adduced by the writer unread and unjudged. And so refereeing it becomes a task of endurance, not to mention gathering the supplementary literary material.[33]

The third referee, Oudemans, finished this last review at midnight on 30 April 1900, writing to Bosscha that the "pencil notes in the margins" had been of great help to him, but that he nevertheless also "had himself checked everything".[34] Indeed, all three referees wrote lengthy reports, including many calculations. A few days later, at the annual meeting of the *Hollandsche Maatschappij*, the unanimously negative verdict of Bosscha and the referees was accepted. It was announced as follows in the 1901 issue of the *Archives:*

[32] Bosscha to Van de Sande Bakhuyzen, 5 February 1900, AHMW, no. 1137.
[33] *Ibidem*.
[34] Oudemans to Bosscha, 30 April 1900, AJB, box 23.

> The lengthy essay [...] 235 folio pages, written in German, was submitted successively to Messrs J.A.C. Oudemans in Utrecht, E.F. van de Sande Bakhuyzen in Leiden and J.C. Kapteyn in Groningen. The reports submitted show that the jury members were led to examining the question posed for themselves, which unavoidably meant a great deal of work. The three referees reported the same [conclusion]: Galileo's accusations had no serious grounds. As for the essay, in spite of the zeal demonstrated by the author, a biased judgment as well as incomplete research put him on the wrong track and led him, erroneously, to the contrary conclusion. Therefore, the too superficial investigation of certain points of prime importance was sufficient to disallow the prize award for this essay. According to this unanimous advice of the referees and the motion of the directors, the assembly decided not to award the prize.[35]

Even in this announcement, Bosscha's bias showed through his use of the phrase "led him, erroneously, to the contrary conclusion". Because Bosscha did not notify the essayist of the decision, Klug had to wait until he read it in the *Archives*. Having labored over his essay, he asked Bosscha for its return, but his request was refused, perhaps because the manuscript had been heavily annotated by Bosscha himself. When Klug appealed this decision to the President of the *Hollandsche Maatschappij*, asking that at least the technical parts of his entry be returned, a compromise was reached whereby a clean copy of the entire manuscript would be sent to its author.

In October 1900, Klug sent a copy of his essay to Favaro, with whom he had corresponded earlier. Favaro, who had kept close watch on Dutch views of Marius, published a brief paper in which he challenged the decision of Bosscha and the referees.[36] He began by making two observations. First, the observations of Jupiter's moons in the *Sidereus Nuncius* were something more than "mentioned" in the wording of the prize question, but the word did describe those of Marius's *Mundus Iovialis*. Second, the reference to Humboldt's *Kosmos* in that same question was an invocation of that historian as an authority, but in Marius's case it was not based on an in-depth study.[37] Favaro then referred to Christiaan Huygens's reference to Marius in his letter published in vol. 2 of the *Oeuvres Complètes*, and said it showed that in the seventeenth century Marius was considered the prototype of a plagiarist. And what were those *recherches récentes* referred to in the footnote to this letter? At this point Favaro called Bosscha's bluff: the referees had investigated the prize question themselves, and their results clearly represented entirely new research that should not be lost to the history of science, and should therefore be published:

35 "Programme de la société hollandaise des sciences a Harlem pour l'année 1900". *Archives*, ser. 2, vol. 4 (1901), 2. Note that at the request of Oudemans, the order of refereeing was changed, putting Oudemans last.

36 Favaro, "Galileo Galilei e Simone Mayr", 220-223.

37 *Ibid.*, 220-221.

> [T]he principal motive that induced me to publicly call attention to this argument, in the periodical that is above all devoted to treating questions of this sort, finds its *raison d'être* in the desire, which will certainly be shared by a great number of scholars, to see the publication of a work in which, based on its scope, the question must have been treated in great depth, and to publicly reveal the facts and reasons that induced the distinguished judges to pronounce themselves in a way that many will find entirely opposed to the one which up to now has generally been held. Certainly, no one was guided by preconceptions, just as I myself am not guided by any preconception in expressing such a wish, but only by the objective that is surely common to my illustrious colleagues of the *Hollandsche Maatschappij der Wetenschappen:* the triumph of the truth.[38]

The challenge could not be ignored. But how should it be answered? Could Bosscha simply print the three referees' reports in the *Archives*? He turned to Oudemans for help, and together they wrote a lengthy reply to Favaro, entitled "Galilée et Marius", which Bosscha published, without having it refereed, in the *Archives* in 1903: "Animated by the same desire as Mr. Favaro, to see the truth triumph, we voluntarily answer his summons".[39]

The principal argument for the rejection of the treatise was that it provided absolutely no evidence [*preuves*] of the crime imputed to Marius, and the new studies that, according to Mr. Favaro, had to be conducted to arrive at the judgment required only the ordinary resources of astronomy. Oudemans and Bosscha had to decline the honor of having arrived at an entirely new conclusion, and they cited a number of earlier studies that had come to the same conclusion.

> But the question cannot be decided by the authority of other scholars, however eminent they might be. Further, the question does not deal with the priority of discovery, for given the telescope, this could not escape the first curious observer who directed his instrument toward Jupiter, and it seems to us of little merit. The question posed in the competition is to know if Marius committed a plagiarism and if Galileo had the right to reproach him for it.[40]

Before dealing with that question, Oudemans and Bosscha described the state of astronomy in 1609. In a note about Galileo and the Leaning Tower of Pisa, an experiment that, according to Favaro, dealt a fatal blow to the Peripatetic philosophy, Oudemans and Bosscha – though likely Bosscha alone – wrote: "If that is the significance of the experiment, the Peripatetic philosophy had been overthrown for more than four years. The experi-

[38] *Ibid.*, 223.

[39] Oudemans and Bosscha, "Galilée et Marius", 116. To ensure a wide distribution of the article throughout Europe, 275 extra offprints were made. See: Oudemans to Bosscha, 12 March 1903 (AJB, box 23).

[40] *Ibid.*, 118.

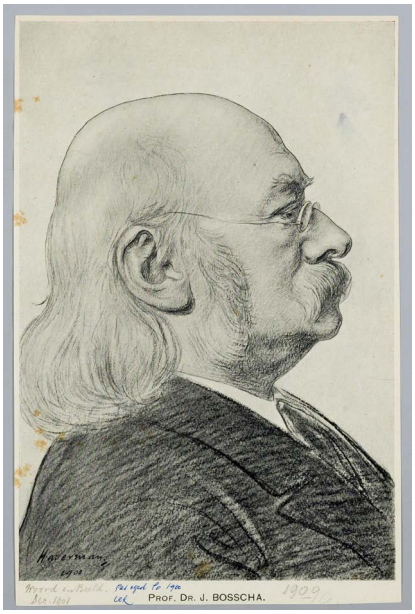

Fig. 1 – Johannes Bosscha (engraving by Hendrik Haverman, 1900, Wikimedia commons).

Fig. 2 – Jean Abraham Chrétien Oudemans in 1884 (Bibliothèque Nationale de France).

ment was described in *Beghinselen des Waterwichts, beschreven door Simon Stevin van Brugge 1586*". And after citing the relevant passage in that work, they continued, "The first works of Simon Stevin are full of facts and demonstrations that were later attributed to Galileo by others or which he attributed to himself".[41] After all, Galileo had numerous correspondents in Belgium! Galileo, then, had not found these results independently but somewhat later; rather, he had actually obtained them from Stevin.[42]

They also discussed the emergence of the telescope. In the rapid spread of this new invention, in 1608-1609, men from Holland, France, and Italy tried to make money from the device of which each claimed to be the inventor: "Among them one regrets finding Galileo".[43] In describing the presentation of a telescope made by Galileo to the Venetian Senate, Oudemans and Bosscha made no mention of the fact that this device, magnifying eight or nine times, was a rather more powerful instrument, than the simple three – or four – powered spyglasses offered for sale by others at the moment. The negative letters in the corre-

41 *Ibid.*, 120, note 1.
42 *Ibid.*
43 *Ibid.*, 125.

spondence of the period were highlighted in their account and a brief analysis of Galileo's explanation of the workings of the telescope in his *Sidereus Nuncius* showed, in their view, that he knew little or nothing about optics. Here Oudemans and Bosscha finally gave the magnifying powers of telescopes made by Galileo. Citing, among other examples, Kepler's *Narratio* of 1610, in which the Imperial astronomer described his first observations of Jupiter's moons through a telescope made by Galileo, even though Jupiter, Mars, Mercury and Sirius appeared square with blue, red and yellow diameters, Oudemans and Bosscha concluded: "It seems to us that with this information the supposed superiority of Galileo's instruments cannot be sustained at all".[44] So much for Galileo; what about Marius?

Oudemans and Bosscha started by citing verbatim the introduction to *Mundus Iovialis*,[45] and ended with the question:

> Can one, in good faith, doubt the sincerity of this account of Simon Marius? Not only everything he says bears […] the mark of very great verisimilitude, but he himself names the highly placed witness by whom one may inform himself about everything he has said.[46]

In their reading, Marius had worked under Tycho Brahe and was familiar with instruments, and when he had an instrument in his hands that increased his visual acuity by a factor of about ten (though Marius does not mention magnification in his *Mundus Iovialis*), he naturally turned it to the heavens and examined the Moon and Jupiter. The latter, approaching opposition, was the brightest object in the night sky. And once that planet was in the field of view, "could the appearance of the three stars arranged in a straight line with Jupiter have escaped him?" [47] This was a reference to first observation described by Marius, made on 8 January 1610 (N.S.), but Oudemans and Bosscha backdated it to before Jupiter reached opposition, which it had on 7 December 1609:

> And how can he who recognizes the merit of an author who first published a discovery be called a plagiarist, when he says he had occasion to make it at the same time or a bit earlier? Does the merit of a discovery depend solely on a date, which almost always, and particularly in this case, depends only on chance? Must Galileo's merit be measured solely by such petty details? If Marius had attached an importance to it capable of diverting him from the path to the truth, why did he recognize that Galileo had preceded him in the discovery of the 4th satellite? Does one believe that in the entourage of Prince Maurice, in September 1608, among elite military officers and engineers, among whom Simon Stevin was conspicuous, no one

[44] *Ibid*., 132.
[45] See also Prickard, "The 'Mundus Jovialis' of Simon Marius".
[46] Oudemans and Bosscha, "Galilée et Marius", 135.
[47] *Ibid*.

> thought of observing the Moon with Lipperhey's instrument, and noticed at least as many details as are shown in the large drawings of the *Nuncius* published in March 1610? And if, after the publication of that book, one of [these officers and engineers] had published that he had seen the same 18 months earlier, should he have been called a usurper and plagiarist?[48]

In this tortured account, then, Marius *noticed* three little stars near Jupiter around the planet's opposition and began *observing* them on 8 January 1610. (In the entire month of December, he never noticed the fourth.) And Galileo was credited solely with discovering the fourth. In reality, what gave Galileo's discovery of the moons its true scientific value was, in the first place, the care he took in observing the formations of the satellites at exactly reported dates and times, and then his persistence in studying them long enough to obtain a sufficiently complete description of the new phenomenon. But according to Bosscha, Marius was a "modest worker," one who did not rush to reap the glory or material advantage of the fruit of his labors.[49] This section of the paper ended as follows:

> Because the verdict pronounced by Galileo on the work of Marius has lasted up to our own days with a persistence that is found so often among the errors of the history of science, and especially in the case of Galileo, isn't the *Hollandsche Maatschappij of Wetenschappen* right to ask about the substance of the evidence to which Mr. Favaro refers in his *Chronologia Galilaeana*:
>
> > 1614. Simon Marius published in Nuremberg his *Mundus Jovialis,* with which he tried to usurp from Galileo the discovery of the Medicean planets".[50]

There was nothing objective in this lengthy introduction. Marius was a modest worker, Galileo an opportunist who stole his rival's glory, not to mention his material rewards, and Stevin, and by implication the Netherlands, were the victims. As Cornelis de Waard was to say when Bosscha was preparing another installment in this controversy, "I hope that [Bosscha] will use evidence in his next study and not ordinary *coups d'authorité*".[51]

The next section of Oudemans and Bosscha's article dealt with Galileo's accusation. The *Sidereus Nuncius* was briefly praised for its arguments for the Copernican theory, although in a footnote they explained that Simon Stevin had openly declared his Copernicanism much earlier, and that the intellectual climate in the Dutch Republic was at this particular time receptive to heliocentrism. They gave figures for the orbital times published by Galileo in his *Discorso*. They also singled out deviations from a straight line in several observations "mentioned" by Galileo in the *Sidereus,* and concluded that in 1610

48 *Ibid*. See also Prickard, "The 'Mundus Jovialis' of Simon Marius", 371.
49 Oudemans and Bosscha, "Galilée et Marius", 136.
50 *Ibid*.
51 De Waard to Favaro, 15 November 1906, Favaro Correspondence.

he was not particularly interested in latitudinal deviations, giving as a possible explanation an atmosphere around Jupiter. When *Mundus Iovialis* appeared, the title alone must have displeased Galileo: the author's name reminded him of the unpleasant episode with Baldassare Capra in 1607. But what really irked Galileo, according to Oudemans and Bosscha, were the words *ope perspicilli Belgici*, "by means of the *Dutch* telescope", which undercut the title words of the *Sidereus, perspicilli nuper a se reperti beneficio*, or "with the help of a spyglass recently invented [or made] by him".[52]

Whereas Marius had been candid about the source of his telescope, they argued, Galileo had tried to claim the invention for himself. Here, Galileo's initial reaction in 1614 is given an interesting twist. Although advised by the Lincei to write to Kepler, Galileo had apparently not done so. Yet, Oudemans and Bosscha concluded that the fact that Kepler's reply (!) was never published showed that Kepler had taken Marius's side.[53] Here the lack of evidence is twisted into evidence of dishonesty. At least one reader of the article took this point as a proven fact: Kepler's letter was willfully destroyed.[54]

After giving the background to *Il Saggiatore* and citing Galileo's charge against Marius in full, Oudemans and Bosscha started by removing the accusations that were manifestly false: Marius had nothing to do with Capra's plagiarism; Marius did not hide the fact that his dates were Julian, and Marius's error on latitudes were explained by the fact that he "had come to recognize this phenomenon very late" (*tarde admodum in cognitionem hujus pheanomeni veni.*) All this came from the referee's reports cited above. Galileo's charge that Marius could not have been observing the satellites before 1612 was countered as follows:

> To pretend that before having found his law of the variations in latitude Marius did not see the satellites is a ridiculous assertion, one which could lead to the conclusion that Galileo himself, who had never formulated any rule before Marius's publication, had himself not observed the satellites before Marius. In our view, extending that reasoning to the conclusion that in writing his publication Marius had not even seen the satellites constitutes a gross insult. One would have to admit that Marius had lied in saying that he had observed Jupiter with a telescope. [147-148] And Galileo had himself written in 1611 that Jupiter's satellites could be verified not only by telescopes made by him, but also by instruments made anywhere by any craftsman, provided they were well wrought and of sufficient magnification.[55]

[52] Oudemans and Bosscha, "Galilée et Marius", 139.
[53] *Ibid.*, 140.
[54] Lynn, "Galileo and Marius", 63.
[55] Galileo to Piero Dini, 21 May 1611, in OG, XI, 106-107. The context here was that of verifying Galileo's discoveries, which had been denied by many up to the testimony of the mathematicians of the *Collegio Romano* to Cardinal Bellarmine, 21 April 1611.

Was this also the case a year earlier, when no one was able to verify Galileo's discoveries announced in *Sidereus Nuncius*? The two volumes containing Galileo's correspondence for the period 1610-1612, volumes 10 and 11 of the *Opere*, in which the problem of verification of his discoveries during 1610 and 1611 were discussed at length, were published in 1900 and 1901, respectively, so Oudemans and Bosscha should have known that between March 1610 and May 1611 (the reference in the citation above), the art of making good telescopes underwent enormous improvement. Using Galileo's statement of May 1611 to argue that telescopes made in any place with a skilled and willing craftsman could have shown Jupiter's satellites in January 1610, or even in December 1609, leaves the reader wondering. If Favaro clearly stood on the side of Galileo, Oudemans and Bosscha adopted the opposite stance. As far as Galileo's accusation, based on the latitudes of the satellites, that Marius had not observed these bodies before 1612, it was once again countered by citing Marius's statement "I came to know this phenomena very late".[56]

The more technical part of the paper, supplied by Oudemans, dealt with the respective theories of the inclinations of the planes of the moons and concluded that Galileo did not arrive at his theory that the orbital planes were parallel to the ecliptic until 1623.[57] Oudemans then showed that Marius's tables were reasonably good for that time and that his ideas about latitude were fine for the period of his observations (1610-1613), provided that one bore in mind that Marius came to considering latitudes late in the game, and that these early observations were made without wire micrometers, which were adopted only in the 1660s.

Taking a small detour, Oudemans and Bosscha pointed out that Marius had found a way to resolve the fixed stars into discs, presumably by stopping down the aperture of his telescope drastically, and that he had expressed surprise that with his excellent telescopes Galileo had not observed this phenomenon. Since they knew that even the telescopes available in 1903 could not resolve the stars into discs, they concluded, "It was thus Marius who discovered the spurious disc and by this proved not only that he was a good observer, but also that he had at his disposal a telescope better than the one used by Galileo".[58] Again Galileo's correct inability to resolve stars into discs was evidence of his shortcomings, while Marius's erroneous observation added to his credit.

Beaten down by the Galilean juggernaut, they related, Marius did not have a happy life: "After the publication [of *Mundus Iovialis*], when he was long-suffering, nothing further of his appeared on this subject; he died on 26 December 1624, a little more than a year after

[56] Oudemans and Bosscha, "Galilée et Marius", 147, note 1.

[57] *Ibid.*, 149. In March 1903 Oudemans wrote to Bosscha that he preferred that in their joint article would be stated "that the astronomical part was edited by me and the historical part by you". He also expressed as his whish not to be responsible for "everything you [Bosscha] have written", AJB, box 23.

[58] *Ibid.*, 165.

learning of Galileo's cruel aggression".[59]

Oudemans' and Bosscha's paper included a number of appendices. Oudemans "verified" the accuracy of Marius's tables; Bosscha calculated the field of view of the Dutch or Galilean telescope, arriving at a figure roughly half the 15 arcminutes currently accepted, and presented a French translation of the added text of the second edition of *Mundus Iovialis,* along with somewhat more accurate values of the orbital periods of the satellites. Oudemans calculated that for the latitude deviations from a straight line during the period of Marius's observations, one could simply look at precise observations made from 1857 to 1859, when these were closely repeated, and finally he showed *using Marius's tables* that a recent claim[60] that Galileo had observed an eclipse of Europa on 12 January 1610 was in error, and that Marius was correct in saying that Galileo's first observations were not very accurate.

This was not the end of the story for Bosscha. When Klug's improved prize submission, "Simon Marius aus Gunzenhausen und Galileo Galilei", appeared in the *Abhandlungen* of the *Königlich Bayrische Akademie der Wissenschaften* at the end of 1904,[61] Bosscha felt that he had to take up the cudgels for Marius again, because Klug's essay had caused at least one important critic in Germany to change his mind, and to decide that Galileo had been correct in his accusations.[62] Again, he chose Oudemans as his co-author, but this time his colleague was somewhat more critical of Bosscha's pronouncements. In several of his letters Oudemans told Bosscha that he did not want a certain phrase or argument to appear under his name.[63] But after Oudemans' death, in December 1906, Bosscha could write as he pleased.[64] The result appeared in two parts in the *Archives* the following year

[59] *Ibid.*, 154-155. The date is Julian, and one would expect a note to that effect.

[60] Houzeau, *Vade-Mecum de l'Astronome*, 665.

[61] Klug, "Simon Marius". According to the index of the *Abhandlungen*, Klug's essay was already published in 1904, which is confirmed by the copy in the British Museum, bearing the stamp "3 Jan. 1905". However, the printed text reached Bosscha and Oudemans only in September 1905. See AJB, box 23: Oudemans to Bosscha, 24 September 1905, in which letter Oudemans noted as his first response: "It can be seen from everything that this Klug is not an astronomer, and yet he wants to speak the highest word on an astronomical subject. He is nothing more than a stupid and, in his struggle, false dilettante". On 4 October 1905, he was a lot more nuanced: "reading further [in Klug] I find things which, if true, compromise Marius quite a bit".

[62] Gerland, Review, 840-841: "So [Klug's] work could […] banish Marius's claims to the discovery of Jupiter's satellites from science forever". See also Bosscha, "Simon Marius. Réhabilitation d'un astronome calomnié", 260-261.

[63] Oudemans to Bosscha, 10 March 1903 and 11 January 1906, AJB, box 23.

[64] After Oudemans' death, Bosscha asked the Utrecht astronomer Albertus Antonie Nijland (1868-1936) to take over Oudemans' role, but although Nijland agreed, no collaboration happened. Nijland to Bosscha, 1 August 1907, AJB, box 23.

with the title "Simon Marius. Réhabilitation d'un astronome calumnié".[65] After once again painting Marius as a victim, Bosscha busied himself with calculations and comments regarding Galileo's particular ability as an observer and as a scholar in general. For instance, he adduced Galileo's *Jovilabe* as evidence of his sloth, in contrast to Marius's diligence. At the end of the first installment, Bosscha told the reader that he was dividing this work into seven chapters, all technical, except for the final two: Kepler's relations with Marius and the two cases of Galileo and Capra! At the age of 76, Bosscha was not about to give up his assault on Galileo. But only one of the chapters appeared. In 1909 Bosscha stepped down as Secretary of the *Hollandsche Maatschappij*, and died two years later. His efforts have certainly had an impact on the reputation of Marius. The 400th anniversary of the appearance of *Mundus Iovialis* was celebrated in style at a number of events held in the Franconian area of Germany, Marius's home turf. Bosscha's attacks on Galileo have led to nothing. Even if, in retrospect, there was no need for a vigorous defense, Favaro met every one of attacks with reasoned arguments, and, even supplied Bosscha with new information. But in the constant reassessment of Galileo by historians since 1907, the name Bosscha appears nowhere. Upon Bosscha's death in 1909, Cornelis de Waard asked Favaro whether he had heard the news, and characterized Bosscha as "the man who loved Marius too much".[66] Perhaps it would have been more appropriate to call him the man who hated Galileo too much.

[65] Bosscha, "Réhabilitation d'un astronome calomnié".

[66] De Waard to Favaro 16 June 1911, Favaro Correspondence.

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Abbreviations

AHMW = Noord-Hollands Archief, Haarlem: archive of the *Hollandsche Maatschappij der Wetenschappen*.

AJB = Noord-Hollands Archief, Haarlem: personal archive of Johannes Bosscha.

Archives = *Archives néerlandaises des sciences exactes et naturelles* (Haarlem), [several years].

JKGW = *Johannes Kepler Gesammelte Werke*. Edited by Max Caspar, Walther von Dyck et al. Munich: 1938-2017.

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