
ANTONIO FAVARO

Apocryphal Galilean Writings*

The historians of science have only recently learned of the existence of a sixth volume of the grandly conceived work of the abbé Raffaello Caverni entitled *Storia del metodo sperimentale in Italia*. Five volumes had already been published between 1891 and 1898. The sixth volume was published, one might say, in an almost furtive way. In fact, the first notice of it was given in a journal by Aldo Mieli just a few months ago. Among materials he is collecting under the heading, "For a Biography of the Italian Historians of Science," in addition to other things already said about Caverni in a previous issue, Mieli has published the following "information received from G. Vacca": "The printing of the sixth volume of the *History of the Experimental Method in Italy* dealing with the history of hydraulics had been started but was interrupted by the author's death. About 450 pages have been printed, the greater part of the copies of the loose sheets have been lost."¹

I immediately set about trying to procure a copy of these papers through a very influential person in Florence where the first five volumes were printed, but my search was in vain. I had almost given up hope of getting the remaining piece of the sixth volume when its existence was definitely confirmed some weeks later by my colleague Loria.

At almost the same time I received from the bookshop of Oreste Gozzini in Florence the catalog no. 60, dated November 1, 1916, in which I found that a copy of Caverni's work in six volumes was registered under entry number 890. Without losing any time, I approached the National Central Library of Florence, not doubting for a minute that the sixth volume would also be in its possession, at least in virtue of the press laws. In fact, this volume was said to have been printed in Florence in 1900 by the same Civelli Publishing House that had published the other five volumes. To my great surprise, however, I was told that the above-mentioned volume was not in the Library. Finally, my colleague Loria let me know that he had meanwhile been able to buy a copy of the legendary volume from a

* Translator's note: This second version of Favaro's article was published in *Atti e Memorie della Reale Accademia di Scienze, Lettere ed Arti in Padova* (1919–20), 17–30. Reprinted in Favaro 1992a, 141–54. The modernized and standardized list of references can be found in a bibliographical section at the end of the appendix. In this second version, Favaro noted that the article was first published in *Bollettino di bibliografia e di storia delle scienze matematiche*, 19 (1917), 33–43. He added the following comment: "As I did in other cases, I republish this article in the present collection because of its importance for my work on Galileo, adding to the first version the result of subsequent investigations."

¹ *Rivista di storia critica delle scienze mediche e naturali*, 7 (1916), No. 4, 125.

traveling bookseller and so I accepted his kind offer to send it to me on loan. The following is what I should, or rather must, say about it.

All this preamble was not misplaced because I wish to clearly establish that neither myself nor other historians of science, neither bookshops nor public libraries knew about this volume which, according to its front page, was printed in 1900. Therefore, all that I have written up to now on my favorite subject of study has to be considered totally independent from the content of this volume.²

This sixth volume, or tome if you will, really appears to be a continuation of the five previously published volumes, the last of which gives, as we said before, 1898 as its date of printing. Volume 6 has been printed with the same fonts and on the same kind of paper, and is therefore in the same format as the other five volumes. The cover is identical to that of the preceding volumes, except that we read: "This volume is incomplete because the author died while he was preparing the work. Everything of the manuscripts left behind by the author has been printed."³ Actually, the volume ends abruptly on page 464, i.e. at the end of the 29th folio, while it is absolutely impossible that the author's original text ended in this way. The editor, who moreover let pass so many and such serious mistakes, had not enough pity to at least go to the end of the sentence and to add some opportune words, as well as a little index of the chapters contained in this stump of a volume.

First we note that in this sixth volume there is a first part: "On the Experimental Method Applied to the Science of the Motion of Liquids." According to the author's original plan (Caverni 1891–1900, 1:260), volumes 6 and 7 would have dealt with the history of hydraulics. The origins of hydraulics and the progress achieved by Galileo and Castelli was to have been disclosed in the sixth volume, while the seventh volume was reserved to show to what level of perfection the disciples and followers of the two great masters had brought the science of the motion of liquids. Actually, Caverni considered the science of liquids to be divided into three parts, namely hydrostatics, hydrodynamics, and hydraulics. Therefore he declared that he would divide its history into three parts as well, treating the first two parts in this sixth volume while keeping the third part for the seventh one (Caverni 1891–1900, 6:9). In spite of this plan, some questions regarding hydraulics in the proper sense are also discussed from an historical point of view in this uncompleted sixth volume.

It is not our intention, however, to enter into detailed examination of the content of this sixth volume, although it would offer much scope for inquisitive and interesting considerations, particularly regarding the deeds of Leonardo da Vinci and Cardano. One might also examine how the author persists and even degenerates further in pursuing his insane aim of denigrating Galileo at any cost, to the point of representing him as a champion of Peripateticism even in compari-

² This is meant particularly with regard to my monograph on Mersenne, whose galley proofs I passed for the press on 4 November 1916 (Favaro 1916–17, 92).

³ Abbé Raffaello Caverni died on 30 January 1900.

son with his Peripatetic opponents. Instead, we want to take this opportunity to draw the scholar's attention to certain passages of this sixth volume, in which we find texts reproduced that are more or less directly attributed to Galileo but which, in our opinion, can by no means be attributed to him.⁴

In the previous volume, Caverni has already made use of his outstanding ability to imitate the Galilean style, particularly in the dialogue form, by taking advantage of or rather exploiting his amazing facility in manipulating language.⁵ He had also given a very nice proof of this ability in another occasion.⁶ By inserting in the right places typical, authentic phrases from a genuine Galilean text, Caverni had tried to pass off as stuff of Galileo what was indeed nothing but his own very skillful and refined falsification. Such an action is always bad but more so when done by an historian, especially one who has repeatedly been recognized as someone who totally lacks objectivity. We think that we have the right and duty to point this out for two reasons: first, to warn those who have recourse to that work and would not have noticed the falsification on their own; and second, to somehow vindicate the National Edition, which indeed would have been blameworthy of negligence had it omitted such a substantial part of the Galilean work.⁷

Addressing the facts, let's start by noting what Caverni writes in the above-mentioned volume 5, at the point where he mentions the subjects that should have been treated in the sixth of the *Dialogues Concerning the New Sciences*. Caverni reports Salviati's promise to explain the utility of observing how a little chain hanging loose from its extremities bends and assumes a form that in certain cases coincides almost to a hair with the parabola (Caverni 1891–1900, 5:143). At this

⁴ We do not want to overlook the fact that a short treatise ascribed to Viviani and entitled "De radiis fluidis" is also published in this volume (Caverni 1891–1900, 6:247–64). Since we ourselves published a monograph on Viviani some years ago and on that occasion carefully examined all of his papers, we owe ourselves and the public an explicit declaration that the attribution of this short treatise to Viviani is absolutely arbitrary. This attribution has been patched together by Caverni from some notes of an unknown hand found among the manuscripts of the Accademia del Cimento.

⁵ We do not want to go back any further; we shall rather limit ourselves to noting that there are instances since the first volume that reveal Caverni's ease in recognizing strictly Galilean texts in the works of more or less true disciples. In it we read: "Many of the writings of the great master return to life in the handwritten and printed works of Borelli, as would be the tables of the average motions of Jupiter's satellites, the instructions how to use this instrument in the observations of Jupiter, the discourse on the rudder's mechanical function in directing ships, and other Galilean texts whose copy as well as original are lost" (Caverni 1891–1900, 1:190). At this point it would be useful to remember that, as a matter of fact, Gio. Alfonso Borelli was not a disciple of Galileo because he came to Tuscany for the first time in 1656; he was only a pupil of Castelli in Rome and fellow of Torricelli. Galileo knew Borelli only by name in so far as the latter had been suggested to him by Castelli as lecturer for the University of Pisa, at the time when the chair of Mathematics there was about to become vacant due to Dino Peri's hopeless health conditions.

⁶ We refer to the dialogue between Galileo and Salviati masterly invented by Caverni and inserted in his *Ricreazioni scientifiche* (Caverni 1882, 204–43).

⁷ The same can be said about several other cases in which Caverni ascribes to Galileo writings of other people. However, since it would take too long to enumerate all of these cases, we shall rather limit myself to pointing out as an example certain handwritten "Notes" made by Viviani about some passages of the *Dialogues Concerning the New Sciences* and contained in the V part, IV vol., fol. 14 f., of the Galilean Manuscripts in the National Library of Florence. Caverni pretends that these notes are handwritten by Galileo and he derives from them what needed to support his arguments (Caverni 1891–1900, 4:303).

point Caverni writes that he himself, as the “first and only one”⁸ having searched for where and how Salviati’s promise was fulfilled, found the second part of the Galilean dialogue that followed the discussion on percussion and thus completed the Day.

Everyone would now expect to be informed of where and how Caverni found this most valuable manuscript, from which he extracts more than eight pages of dialogue with the same interlocutors as in the authentic one, namely Salviati, Sagredo, and Aproino. In fact, Caverni avoids this question by writing: “We shall abstain from narrating how we made the discovery amongst certain jumbled manuscripts given to us by a friend for examination because we believe that our readers would rather wish to learn without delay what we copied from it” (Caverni 1891–1900, 5:143).⁹ But what is presented here as a “Galilean dialogue” is no longer one at the end of the transcript where, on the contrary, doubts are cast upon its authenticity. We can in fact read:

The dialogue breaks off at this point but the treatise on the use of the small chains is in any case complete; what we feel might be missing is only the more or less ceremonious farewell of the interlocutors. Anyway, even if our readers agree that the entire argument is included in the transcript, they could ask *for the reasons which induced us to ascribe this text to Galileo*. (Caverni 1891–1900, 5:152)

It is then no longer a matter of an authentic text but rather of something attributed to Galileo by Caverni, who then explains that one has to distinguish between form and content. In order to prove that the content is purely Galilean, Caverni appeals to a theorem that he inserted into the text and which does indeed exist written in Galileo’s hand among the “Fragments Pertaining to the Discourses and Mathematical Demonstrations Concerning Two New Sciences.” These “Fragments” have been published in full for the first time by us in the National Edition, where they constitute one of the most radiant gems (Galilei 1890–1909, 8:363–448. The cited theorem can be read on page 367). Caverni then adduces as evidence for the attribution a drawing, also included in the “Fragments” (*ibid.*, 369–70), in which Galileo looks as if he wants to apply a certain proposition, cited by Caverni, in order to derive the parabolic form of the little chain. Further on, Caverni finally declares that the dialogue, or rather the fragment of a dialogue, which he pretends to have found in a copy of that time, should be attributed to Viviani (Caverni

⁸ When Caverni wrote that about himself he had probably forgotten the bitter reproach he himself had previously made to Galileo because of a similar boasting (Caverni 1891–1900, 1:128, and 2:374). Furthermore, it is an essential difference that Galileo wished to have been the first and only one (Galilei 1890–1909, 7:540), whereas Caverni claims to have been the first and only one.

⁹ In the “List of the documents taken from the Galilean Manuscripts and reported in the order of the chapters,” at the end of this volume, we can read about this text: “Treatise on the proprieties of the little chains usable in ballistics, written in dialogue form in order to be added to the treatise on percussion, at last found among the Galilean manuscripts (*sic*) and here published” (Caverni 1891–1900, 5:653).

1891-1900, 5:153), and adduces as evidence for this attribution a passage from Viviani's "Summary of the last works of Galileo" in which, he writes, "one can easily see summarized the dialogue we have transcribed" (*ibid.*, 154; Viviani 1674, 105-06).

[Text omitted]

And now let us move on to volume six. The source of the new Galilean writings contained in this volume is the same from which Caverni drew, or rather writes that he had drawn in the just mentioned occasion. But even in the case of these manuscripts nothing is said at all about where they were and to whom they belonged at the time when they were offered to Caverni, as he pretends.

One of these new writings is a dialogue rendering in nearly ten whole pages the short Galilean treatise on the small balance (Caverni 1891-1900, 6:111-20). But on this occasion Caverni, in our opinion, relied a bit too heavily on his experience acquired in concocting such fakes and he did not attend to the imitation of Galileo's language and style with the usual diligence. Especially in the objections which he puts into Simplicio's mouth there is too much, let us say, simplicity, which is too far from the relative keenness showed in the genuine Galilean dialogues by this curious character. Our opinion is confirmed also by the insertion in this dialogue of other arguments closely connected with the small balance and extracted from letters and writings of disciples and of the numerous commentators of the original treatise.

Caverni writes that he also drew other things from the same previously mentioned source that are connected with, or at least should be connected with, the studies made by Galileo on the force of percussion. These studies were intended to provide the argument for what Albèri called "Sixth Day," but we have entitled them, with greater adherence to the content as well as appropriate scrupulosity, "Beginning of Day Added to the Discourses and Mathematical Demonstrations Concerning Two New Sciences" (Galilei 1890-1909, 8:319-46). As to the connection, in this fragment of dialogue Galileo puts into Aproino's mouth the account of one of the experiments carried out in his Paduan house (*ibid.*, 323). It was aimed at searching for a way to measure how much the weight of a striking body and the speed with which the body is moved might influence the effect and operation of percussion.

Now Caverni claims to have found among these papers some notes relating to this theme, at the beginning of which Viviani wrote, as he did in some other occasions that we mentioned, "I have the original of this." A dialogue exposing the substance of these notes and carrying the remark "ad mentem Galilaei" can also be found a few pages later, according to Caverni (Caverni 1891-1900, 6:369). Indeed, this remark by Viviani happens to be found on top of some of his other studies on the master's teachings that were scattered among his papers and collected in the Galilean Manuscripts. This dialogue, which Caverni attributes to Viviani, should

be inserted, according to the former, at the point of the authentic one where Aprozino speaks (Galilei 1890–1909, 8:325). To be more precise, the insertion would take four pages starting from the middle of the first line of Salviati's reply which, in spite of the long variant, would continue unaltered (Caverni 1891–1900, 6:371–75). After this insertion, Caverni writes:

There is no doubt that Viviani would have reported this part also, together with other parts of perhaps less importance, had it been possible for him to publish the "Dialogue on the Force of Percussion." But the task of publishing the "Dialogue" was to be fulfilled by Bonaventuri and we may assume that Bonaventuri did not include this part in his edition,¹⁰ as would have been desirable, only because Grandi, for whatever reason, did not show it to his editor friend. Grandi should have read this part of the dialogue along with the papers received from Panzanini. (Caverni 1891–1900, 6:375)

By entering into all these details Caverni provides us with the most effective arguments that undermine the foundations of his assertion regarding the origin of the papers which he pretends to have made use of, and he thus enables us to demonstrate that these papers never existed. As we reported above, the correspondence of Panzanini and Buonaventuri with Father Grandi has reached us.¹¹ These letters provide full and sure evidence for the fact that the only papers Panzanini gave at first to Buonaventuri were the well known bundles of manuscript authenticated by Prince Leopoldo de' Medici on March 2nd, 1667 ab Inc[arnatione Domini], containing Viviani's treatise concerning the resistance of solids. This treatise had given rise to the famous controversy with Marchetti, which went on until the next generation. Buonaventuri was expected to copy the papers and hand the copies over to Grandi but, since the transcription was taking too long, he decided to send Grandi the originals. Grandi then published the treatise with some important additions in the first Florentine edition of Galileo's works.¹² However, all these writings were afterwards returned to Panzanini and are now among the Galilean Manuscripts in the National Library of Florence.

As to what Viviani would have done if he had been able to publish the so-called "Dialogue on the Force of Percussion," we beg to totally differ with Caverni. Granted for a moment that the facts were as Caverni wants us to believe, we firmly maintain that Viviani would never have dared replace the words of his master with his own, no matter how sure he was of correctly interpreting his thought. Our supposition is strongly supported by the meticulous care Viviani exerted in editing

¹⁰ Galilei 1718. On this edition, see our article Favaro 1917–18.

¹¹ University Library of Pisa. Letters to Fr. Grandi. Vol. 4: Letters of Buonaventuri (83 items); vol. 13: Letters of Panzanini (16 items). One should also examine the letters of Benedetto Bresciani in vol. 3 (58 items).

¹² "Trattato delle resistenze principiato da Vincenzio Viviani per illustrare l'opere del Galileo ed ora compiuto, e riordinato colla giunta di quelle dimostrazioni, che vi mancavano dal P. D. Guido Grandi Abate Camaldolese, Mattematico di S. A. R. e dello Studio Pisano." (Galilei 1718, 3:193–305).

the “Beginning of the Fifth Day,” to the point that he even marked the paragraphs in which he suspected that something could have been penned by Torricelli.

Indeed, in dealing with the manifestations of Galileo’s thought, no care to guarantee perfect authenticity should be considered superfluous. Thus, even if we leave out of consideration the intrinsic reasons we adduced above, we believe that the lack of exact indications as to the sources, whereas the quotations are generally so studiously detailed, justifies the doubts of the most, the suspicion of the many, and the certainty of some that these multiple discoveries of Galilean dialogues are nothing but a literary abuse. Therefore, the greatest caution is recommended when making use of the conclusions of this work, which is otherwise so rich in merits and so worthy of being studied, as should be properly recognized.

[Text omitted]