

Interactive comment on “Beyond Perrault’s experiments: Repeatability, didactics and complexity” by Stefano Barontini and Matteo Settura

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We thank Prof. Dani Or for the comments. We will account for them in a revised version of the paper, as we report in the point-to-point reply:

1. Nace’s article of 1974 (doi:10.1111/j.1752-1688.1974.tb05623.x) represented an important source for our paper, however the aim and methods of the two papers are essentially different. Nace presented both a thorough historical and biographical account of Perrault’s life and a detailed summary of the content of Perrault’s book. Our focus is rather on the epistemological value of Perrault’s experiment and on the relationship between his work and Scientific Revolution. For exam-

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ple we analysed Perrault’s text and found relevant correspondences between his sentences and that of thinkers such as Pascal and Descartes. Moreover we analysed Perrault’s view on experiments and experimental method as expressed in the letter to Mr. Huygens, which has been quite ignored by previous works on the argument.

2. Maignan’s experiment is reported in the third part (*Philosophia naturalis, Natural philosophy*, Chapter 14, Proposition 14) of his *Cursus philosophicus... (Philosophical course...)* published in 1653. In a revised version of the paper we will add the full reference to Maignan’s experiment and a little more details, but his report is not much more detailed than what is reported by Schott (1663), most of which was already reported in our paper. Moreover it is noteworthy that Maignan presents his experience in the context of a wider discussion *De gravi & levi*, i.e. *On the gravity of things*, deeply framed in Aristotelian Physics, and his experience is not directly referred to a discussion on the hydrological cycle. It was Schott who took Maignan’s experience and used it to support his dissertation on the hydrological cycle.
3. We agree that Lucretius had a quite advanced understanding of the water cycle, but we did not focus on his work, because he is not mentioned in Perrault’s book. In fact Perrault cursory mentioned Epicurus, while a reference to Lucretius may be found in Schott. However they did not enter in detail of the comparison between their own understanding of the hydrological cycle and Epicurus’ and Lucretius’ ones, as their main term of reference is always the Aristotelian tradition, which was followed by many scholars until Perrault’s age and beyond.
4. In our opinion, relevant keys to enlighten the cultural importance of Perrault’s experiments, also by an epistemological point of view, are their repeatability and their didactic implications for modern students. Moreover, far from the idea both of glorifying modern models of soil hydrology with respect to ancient understand-

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ings, and of glorifying Perrault's experiments with modern frameworks, we think that training ancient conclusions with modern theories is a constructive exercise to deeply understand ancient Authors' comprehension of the phenomena.

This is why we presented (for the first time, the laboratory technical report being on its way to be published) some results of the laboratory repetition of the experiments. The fact that we may qualitatively and, at some extents, quantitatively repeat Perrault's experiments, more than three centuries later, emphasizes their relevance in the context of the Scientific Revolution.

Then, we proposed a discussion on the didactic implications of teaching the soil hydrology through Perrault's experiments, and in this context we reported some aspects of a numerical experiment we performed some years ago. Yet we did not reported the results of the reanalysis, as they have already been published in the referred work (Barontini et al., 2013, doi:10.1016/j.proenv.2013.06.067). Here our focus was to propose a discussion on the framework that was followed, with respect to its didactic usefulness.

In the present version of the paper we did not refer to the buried clay pot experiment, because according to Nace (1974) it was not performed by Pierre Perrault, but probably by Pierre's brother Charles and by Philippe de la Hire (Philip et al., 1989, doi:10.1029/WR025i001p00016). Yet it may be interesting to contextualize Pierre's importance in the context of his age, and we will refer to it in a revised version of the paper.

5. We agree that it would be excessive to define Perrault as an epistemologist of complexity: it is always important, while discussing such issues, to bear in mind the historical context. However, Perrault's experience in soil hydrology led him to general reflections on the limits of experimental method. These reflections are not our subjective opinions: in the letter to Mr. Huygens Perrault clearly and openly expresses his perplexities about the blind faith in experiments that seems to dominate some of his contemporaries. As far as we know, nobody has yet

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focused on this aspect of Perrault thought, and we find it interesting because it partially clashes with the typical image of a pioneer in Scientific Revolution.

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