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Interactive comment on "Hydrology and beyond: The scientific work of August Colding revisited" *by* Dan Rosbjerg

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R#2: It is mentioned multiple times in the manuscript that Colding developed his theories simultaneously to other pioneering scientists such as Darcy, Joule et al, but was never recognized for his findings. The validity of these statements is difficult to prove and must been seen as postulates, and whether or not the experiments were purely independent can be questioned. I guess that the Code of Conduct for Research Integrity was rather fussy at that time.

Reply: The message was not that Colding was not recognized at all, but that it has been far from the level he might deserve. He cannot be found in international hydrological literature except for the short remark in the book of Brutseart referring to second hand

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information without a proper reference to Colding's paper. Joule published on the first law of thermodynamics in 1843, the same year in which Colding submitted his treatise. A year before, Robert Mayer had published on the subject. I shall add references to Mayer and Joule. All three claimed priority to the finding. The real break-through for the first law of thermodynamics, however, came first after1847, where Herman Helmholz published the book "On the conservation of force". He referred to Joule, but later he also recognised the pioneering works for Mayer and Golding. Since the first law of thermodynamics is not the focus of the paper, I have chosen not to elaborate on the subject. In the work Colding (1871b) there are several references to Darcy's experiments on pipe flow, but no one in the work Colding (1872) on groundwater. I find this a strong indication for Colding's unawareness of Darcy's groundwater paper.

R#2: The figures are of poor quality and give little insight into the actual experiments and development of theories. It is probably difficult to improve the quality of the original works, but a professional re-drawing might be an option if the reader should be able to make anything out of the figures.

Reply: Unfortunately, the quality of the figures in the pdfs of Colding's manuscripts I could get access to was rather poor. In my processing, the figure quality may have become even worse. I shall try to improve the quality as much as possible. Regrettably, a professional redrawing is not an option.

R#2: Although the original works (which are well-cited) are in Danish, it could be interesting to include some citations and quotes from his original works. Maybe in Danish with a translation into English. This could contribute to improving the validity and scientific quality.

Reply: The writing style of Cloding is rather wordy. I doubt that it will fit well into the paper to include direct citations from Colding's work and translations of these into English. It would inappropriately expand the size of the paper.

R#2: Whether the publication is suitable for the special issue on History of hydrology, I

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will leave for the editor to decide. The paper is interesting from a historical point of view, but it is mostly summarizing the works of Colding at a rather superficial and narrative level. The manuscript would fit well into a book on the history of hydrology. In my view, details of experiments and development of theories could be detailed more based on the original work in order for the manuscript to have any real scientific impact.

Reply: My intention has been to present Colding's work in a relatively short form with primary focus on the hydrologically related subjects. Without changing this intention, I may elaborate slightly more on some of the subjects.

Thanks for the comments, they have been very helpful.

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