

Carlo Rovelli

“Aristotle’s Physics: A Physicist’s Look”

Comments from the Chat

From Tom M. to all (5:37pm)

Actually Aristotle DID say what would happen if there was no air (but a void - which he was arguing against). In Physics IV.8 (a_19) he says, essentially by an argument from translational symmetry that obtains in a void, that moving bodies would never stop. This is very impressive as it not only anticipates inertia (but one that in his observations was not supported) but also clearly resonates with Noether’s theorem.

From Doug H. to all (5:45pm)

Thanks for this interesting detail. Here’s a fuller reference: Physics IV.8, 215a19-24.

From Doug H. to all (6:51pm)

Why do haloes have a circular form, and why does the radius of a halo approximate a quarter of a right angle? The development of this scientific question stretches from Xenophanes to the late 20th c., where the correct theory was confirmed by experiments in Antarctica. The key contribution was made by Aristotle, who argued that it was an optical phenomenon, not a physical one; this was developed by Descartes in his Optics, using Aristotle’s own diagrams. Further work and better measurements were necessary before the full explanation was reached, and then confirmed. This is another case, parallel to Carlo Rovelli’s comments on Aristotle’s dynamics, where the contribution of Aristotle was fundamental to the history of science, not a non-scientific or anti-scientific approach. Part of the above history is told in M. Johnson, ‘Aristotle’s explanation of the halo’: <https://philpapers.org/rec/JOHTAE-3>

From Tom M. to all (6:54pm)

A note on experiment (rather than observation) that might be helpful: given Aristotle's distinction between natural and violent motion, is it in principle impossible to investigate or learn about natural motions by doing the artificial and prepared actions we call 'experiments' as they involve 'violent' motions. It is another big mistake, I think, made in modern educational material again and again, to ridicule past ages for not inventing the 'experimental method'. It is not all obvious that one can learn anything about the complex and connected natural world by doing anything as simple and artificial as an experiment. Developing that took the great Arab scientists such as Ibn Al-Haytham, the high medieval philosophers such as Grosseteste and Dietrich of Fribourg, and Renaissance thinking of Bacon and Galileo! (ie. it was a hard thing to invent)!

From Sebastien R. to all (7:29pm)

? Question: Following Peter's remark about Aristotle knowing that he argues within one specific domain, does he already know that he is arguing within a "particular regime of approximation" too? (As he knows it for politics, ethics and other domains of investigation, as it is explicit, e.g., in the Nicomachean Ethics).

From Michael C. to all (7:32pm)

? Question: can mistakes lead to progress?

From Adrien D. to all (7:38pm)

? Question: What if anything can a physicist's look at Aristotelian physics tell us about the two distinct domains modern physics currently operates with and in now? (gr vs. qft)

From Marina C. to all (7:45pm)

Reply to Michael Chase: "Can mistakes lead to progress?"

Yes! Mistakes are essential for progress. The Feyerabend argument. Consistency is very dangerous for science. Right now theoretical physics is a very strong halt, which we can only get out of with *very* controversial ideas.

From Maria A. to all (7:57pm)

? Question: Carlo has noted that when answering the question of what science is, we can say that at its core we find the development of conceptual structures. This view has been expressed by scientists in different ways, for instance, in the famous question about what language the book of nature was written in? The language of science is therefore powerful and at the same time sensitive to change. However, the translation of scientific conceptual structures between cultural and disciplinary domains seems indispensable not only for understanding science and its history, but also for communicating science and even doing science, especially collaboratively. Can we outline the margins of what is helpful and not so helpful in translating the conceptual structures of science between the domains of scientific history, theory, and practice?

From Peter A. to all (8:02pm)

A little thought about precision: Aristotle does often say that in natural philosophy we are giving accounts that are true “always or for the most part.” So that suggests a certain lack of precision or perfect predictability.

From Adrien D. to all (8:11pm)

Continuing on from Marina: Speculation is a natural part of any knowledge-practice. The question is where and how far it should be able to go, and most importantly, the incredible importance of the work it must do to come back to the empirical!

From Peter A. to all (8:15pm)

Love closing on Jabir Ibn Hayyan!