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Einstein knew of Boscovich's theory

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I now have reference of Einstein having read about Boscovich's theory, but this was in 1909, after 1905, and don't know if he read of it earlier. A possible outline of how the Establishment has gone wrong in its understanding of relativity is then given.

I have reference to how Einstein knew of Boscovich theory. However, this was after 1905, which is said to be his miracle year when he wrote his special relativity. So no link from this of him being influenced by Boscovich for relativity; but maybe he heard by other means (?) It is a problem that Einstein did not give references, so we don't know his sources. However, maybe Einstein was influenced by Boscovich for general relativity (?)

From Don Howard [1] says: "As great as was the influence of Mach on Einstein, there is another author whom Einstein seems also to have encountered at an early date, an author whose influence was, arguably, still more important, namely, Pierre Duhem. The story of Einstein's first acquaintance with Duhem is instructive not only as regards the content of Einstein's philosophy of science but also from the point of view of appreciating the manner in which Einstein and his contemporaries regarded the intermingling of physics and philosophy.

"When, in the fall of 1909, Einstein left his job at the patent office in Bern and returned to Zurich to take up his first formal academic position at the University of Zurich, he happened to rent an apartment at Moussonstraße 12, directly upstairs from his old friend and fellow Zurich physics student, Friedrich Adler. As chance would have it, Adler had been the other finalist for the very job Einstein was now assuming and–coincidence added to coincidence–just one year earlier Adler published his German translation of Duhem's La Théorie physique: son objet et sa structure (Duhem 1906, 1908)…."

It is in this book by Duhem that mentions Boscovich, in English the book title is: "The Aim and Structure of Physical Theory." [2] It does not go into much detail, the main thing it says is in terms of metaphysics and theoretical physics, by first considering Aristotelian physics:

"If theoretical physics is subordinated to metaphysics, the divisions separating the diverse metaphysical systems will extend into the domain of physics. A physical theory reputed to be satisfactory by the sectarians of one metaphysical school will be rejected by the partisans of another school.

"Consider, for example, the theory of the action exerted by a magnet on iron, and suppose for a moment we are Aristotelians.

"What does the metaphysics of Aristotle teach us concerning the real nature of bodies? Every substance – in particular, every material substance – results from the union of two elements – one permanent (matter) and one variable (form). Through its permanence, the piece of matter before me remains always and in all circumstances the same piece of iron. Through the variations which its

form undergoes, through the alterations that it experiences, the properties of this same piece of iron may change according to circumstances; it may be solid or liquid, hot or cold, and assume such and such a shape.

“Placed in the presence of a magnet, this piece of iron undergoes a special alteration in its form, becoming more intense with the proximity of the magnet. This alteration corresponds to the appearance of two poles and gives the piece of iron a principle of movement such that one pole tends to draw near the pole opposite to it on the magnet and the other to be repelled by the one designated as the like pole on the magnet.

“Such for the Aristotelian philosopher is the reality hidden under the magnetic phenomena; when we have analysed all these phenomena by reducing them to the properties of the magnetic quality of the two poles, we have given a complete explanation and formulated a theory altogether satisfactory. It was such a theory that Niccolo Cabeo constructed in 1629 in his remarkable work on magnetic philosophy.

“If an Aristotelian declares he is satisfied with the theory of magnetism as Father Cabeo conceives it, the same will not be true of a Newtonian philosopher faithful to the cosmology of Father Boscovich.”

So after considering Aristotelian physics and its metaphysics, he then approaches Boscovich’s theory as an objection to it. And given that the Copernican revolution was an overturning of Aristotelian physics by Newtonian physics, then this becomes the correct theory:

“According to the natural philosophy which Boscovich has drawn from the principles of Newton and his disciples, to explain the laws of the action which the magnet exerts on the iron by the magnetic alteration of the substantial form of the iron is to explain nothing at all; we are really concealing our ignorance of reality under words that sound deep but are hollow.

“Material substance is not composed of matter and form; it can be resolved into an immense number of points, deprived of extension and shape but having mass; between any two of these points is exerted a mutual attraction or repulsion proportional to the product of the masses and to a certain function of the distance separating them. Among these points there are some which form the bodies themselves. A mutual action takes place among the latter points, and as soon as the distances separating them exceed a certain limit, this action becomes the universal gravitation studied by Newton. Other points, deprived of this action of gravity, compose weightless fluids such as electric fluids and calorific fluid. Suitable assumptions about the masses of all these material points, about their distribution, and about the form of the functions of the distance on which their mutual actions depend are to account for all phenomena.

“For example, in order to explain magnetic effects, we imagine that each molecule of iron carries equal masses of south magnetic fluid and north magnetic fluid; that the distribution of the fluids about this molecule is governed by the laws of mechanics; that two magnetic masses exert on one another an action proportional to the product of those masses and to the inverse square of the distance between them; finally, that this action is a repulsion or an attraction according to whether the masses are of the same or different kinds. Thus we have developed the theory of magnetism which, inaugurated by Franklin, Oepinus, Tobias Mayer, and Coulomb, came to full flower in the classical memoirs of Poisson.”

Thus from Duhem we have a rough outline of Boscovich’s theory. (NB I would now interpret “calorific fluid” mentioned above as heat energy.) Duhem does point out that not everyone has this view of nature, and talks of a type of atomist that does not like the theory.

He says: “Does this theory give an explanation of magnetic phenomena capable of satisfying an atomist? Surely not. Among some portions of magnetic fluid distant from one another, the theory

admits the existence of actions of attraction or repulsion; for an atomist such actions at a distance amount to appearances which cannot be taken for realities.

“According to the atomist teachings, matter is composed of very small, hard, and rigid bodies of diverse shapes, scattered profusely in the void. Separated from each other, two such corpuscles cannot in any way influence each other; it is only when they come in contact with one another that their impenetrable natures clash and their motions are modified according to fixed laws….”

Boscovich’s theory is a form of atomism, but based on point-particles, not this version of atomism above based on “small, hard, and rigid bodies of diverse shapes…” And in other articles I have pointed out that Boscovich’s theory is the one confined by experimentation, so this “other” atomism is not relevant. People sometimes have trouble with the idea that physical reality is made up of point-particles, but that is the illusion of living in the Matrix. [3]

Now onto the issue of Einstein:

If Einstein only knew of Boscovich in 1909, not in 1905 when he came up his special theory of relativity, then Boscovich would not have influenced him in that theory.

Now another issue is that Poincare came up with much the same theory as Einstein, it had Lorentz transformations and principle of relativity. But generally the Establishment likes to say Poincare had a different theory to Einstein, so that they don’t have to credit Poincare as coming up with special relativity before Einstein.

The sort of things they say [4]: “We saw that it is Poincaré who names and formulates the principle of relativity, names and corrects Lorentz transformations, reports and exploits its group structure. To these examples, we could add that he establishes the method for synchronizing clocks by light signals (La mesure du temps, Revue de métaphysique et de morale, … 1898), the formula of additivity of velocities, the invariance of Maxwell's equations in vacuum, and the hypothesis of the speed of light limit (Poincaré, 1905). Let's not forget that he also already uses a quadridmensional formalism that will inspire the future works of Minkowski, and then some. What is left? He clearly masters most of the concepts and technical tools of what we call now the special relativity theory, except (and it is fundamental !) that it is to him just corrections brought to Lorentz works, part of a dynamics, and what's more, depending upon Maxwell's electromagnetic theory. That's what makes Einstein the real father of the theory, because he presents in his 1905 paper all of these points (except the importance of the group structure of Lorentz transformations) in a coherent theory, building a kinematics on which the laws of physics will depend (and not the other way around), including those of electromagnetism.”

So they try to make out that Poincare theory is different to Einstein 1905 theory.

Now by Dusan Nedelkovich (original 1922) [5]: “A century and a half after Boscovich, Henri Poincare develops almost identically, the relativity of space and space itself, in a way very similar. See especially Science and Method. pp. 95-122. The relativity of space.”

So we now have the possible links: Einstein 1905 develops his special relativity theory possibly unaware of Boscovich, while Poincare develops his theory based on Boscovich. And Establishment goes with Einstein in preference to Poincare, thus they go by a relativity theory that omits Boscovich, and instead has Einstein’s mistakes. Later Einstein learns of Boscovich, and might start changing his beliefs on relativity theory. But Establishment tends to go on his mistakes of 1905 and reject the older Einstein’s attempts to correct relativity. i.e. Modern physicists have built upon the wrong understanding of relativity. My intuition is that Einstein might have known about Boscovich in 1905, possibly from his wife (who was from the same country as Boscovich), but maybe did not pay much

attention to it in 1905, and only later may have paid more attention. Thus in 1905 he might have ignored it, and later in might have paid more attention to Boscovichian ideas in his unified field theory researches. Unfortunately from Einstein we don't get much in the way of references, as to where his ideas were coming from. But as noted in other articles, one of his co-workers LL Whyte was more fully aware of Boscovich.

References

[1] Einstein and the Development of Twentieth-Century Philosophy of Science, Don Howard, University of Notre Dame p.7 https://www3.nd.edu/~dhoward1/Einstein%27s%20Philosophy%20of%20Science-Cambridge%20Companion-Final%20V.pdf

[2] The Aim and Structure of Physical Theory, Pierre Duhem, trans Philip P Wiener, Princeton University Press, p 10- 12

[3] See the film "The Matrix" http://www.imdb.com/title/tt0133093/ For fictional representation that the world we experience might be an illusion.

[4] The father of relativity theory: Einstein vs Poincaré http://naturelovesmath-en.blogspot.co.uk/2010/11/father-of-relativity-theory-einstein.html

[5] Natural Philosophy and Relativity of R.J. Boscovich, by Dusan Nedelkovich (original 1922) Translated by Roger J Anderton ISBN 978-1-291-34450-9 p 69

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